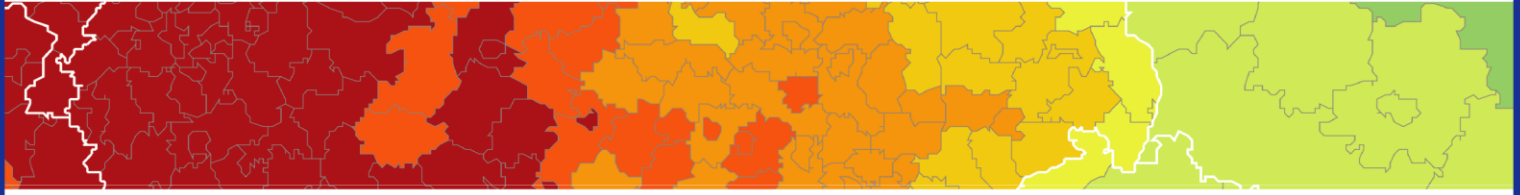


Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG B 2Seas

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG B 2Seas

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview needs and challenges	2
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	3
3 Indicators	6
3.1 Initial result and output indicators used in assessment	6
3.2 Proposed Key Territorial Indicators.....	10
4 Benchmarking.....	13
4.1 Gross Value Added in Knowledge Intensive Industries	13
4.2 Innovation.....	16
4.3 Tourism and Sustainability.....	19
4.4 Regional Scoreboard	22
5 Reference Analysis	24
5.1 Territorial specificity of the programme area.....	24
5.1.1 Smart Growth	24
5.1.2 Sustainable Growth.....	25
5.1.3 Inclusive Growth	27
5.1.4 Main Challenge and Needs.....	28
References	32

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	6
Figure 4.1: Regional Scoreboard.....	22

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	12
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	12
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	15
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors	18
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	21

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.	10
Table 5.1: SWOT Analysis Smart Growth	24
Table 5.2: SWOT Analysis Sustainable Growth.....	25
Table 5.3: SWOT Analysis Inclusive Growth.....	27
Table 5.4: SWOT Analysis Overall Challenges and Needs	28

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

The 2 Seas area covers the coastal regions of 4 EU Member States along the Southern North Sea and the Channel: England (East Anglia; Essex; Surrey, East & West Sussex; Hampshire & Isle Of Wight; Kent; Dorset & Somerset; Cornwall & Isles Of Scilly; Devon); Belgium (Antwerpen; Oost-Vlaanderen; West-Vlaanderen), France (Picardie; Nord-Pas-De-Calais); and the Netherlands (Noord-Holland; Zuid-Holland; Zeeland; Noord-Brabant).

The areas' connection to the North Sea and Channel is a common link across the Programme area. Large parts of the programme area are in close proximity to the capital cities of London, Amsterdam or Brussels. The area has been subject to major economic changes relating to the financial crisis, which have particularly affected SMEs, led to a rise in unemployment and risk of poverty, and impacted on R&D expenditure. However, compared to EU averages, innovation levels remained stable. Environmental concerns and sustainable development are a high priority in what is generally a densely populated area of the EU – large parts of the programme area are in close proximity to the capital cities of London, Amsterdam or Brussels. The Programme area has demonstrated particular strengths in blue economy, environmental technology and bio-technology. The Programme budget is € 392,143,504 with ERDF € 256,648,702 and national counterpart funding € 135,494,802.

2.2 Contribution to EU 2020 strategy & situation in the programme area

The overall objective of the Programme is: to develop an innovative knowledge and research based, sustainable and inclusive 2 Seas. Its contribution to EU 2020 strategy is linked to strengths and weaknesses identified in the programme area.

Under *Smart Growth*, the 2 Seas programme area benefits from the presence of regions with high innovation performance. However, this performance varies across the area. Proximity to large capital cities provides access to a large knowledge market and offers opportunities e.g. for provision of sites for manufacturing. For *Sustainable Growth*, one of the key challenges for the 2 Seas area is to accelerate the movement towards a low-carbon economy. For *Inclusive Growth*, levels of employment, youth employment, educational attainment and share of population at risk of poverty are favourable compared to EU-averages. However, the territorial impact of the economic crisis and increasing levels of territorial polarization are concerns.

2.3 Overview needs and challenges

In the 2 Seas area most regions lag behind targets in relation to: the Europe 2020 low carbon economy theme. Many also are lagging behind on education targets,. For the knowledge economy, the situation mixed, with some regions below EU targets. Employment in the 2Seas area is the only target where most regions are on track, but the financial crisis will have a

negative impact. On the basis of an initial broad analysis, the programme focuses on the following key areas: In relation to *R&D and innovation*, the strength of some regions in R&D and high tech sectors is highlighted. At the same time, the area faces the lower performance of SMEs in R&D, territorial polarisation, social exclusion and lack of social innovation, the risks of brain drain and demographic ageing, outsourcing of R&D, skills shortages, internal competition and the lasting impacts of the economic crisis. Opportunities are identified in *social innovation*, targeted innovation policy and cluster development in: logistics, transport; environmental & marine technology (“blue economy”); agri-food; life sciences & health; communication, digital and creative industries. Issues linked to *climate change* is another area highlighted. Strengths are the area’s capacity and policy focus on the issues. Weaknesses include the area’s high vulnerability and sensitivity to climate change, and capacity issues in the most vulnerable regions. Together, these offer significant opportunities in relation to information sharing and planning, collective actions to address coastal and marine issues. In relation to the shift to a *low carbon economy*, the Programme notes the potential for renewable energy and energy efficiency across the region and accompanying policy commitment. However, the fact that the regions have high levels of carbon emissions and renewable energy production lags behind targets are identified as weaknesses. Opportunities are noted in relation to the development of renewables such as off shore wind and solar power and newer forms of energy production and efficiency. Threats are low acceptance, investment and take up of new technologies and solutions. No specific instruments related to integrated approaches are used. Although reference is made to the need for integrated coastal zone management.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1.1: Improve the framework conditions for the delivery of innovation, in relation to smart specialization

Priority Axis 1: Technological and social innovation (TO1, IP 1b)

- *Brief justification:* Innovation and competitiveness are a major challenge for 2 Sea regions facing international competition. It contributes to boosting economic growth and job creation.
- *Main change sought:* Improved conditions for innovation to the benefit of all stakeholders in the innovation chain
- *Expected activities:* Stimulating the cooperation of public and private stakeholders, civil society and research entities according to the “quadruple helix” paradigm; introducing and adopting common approaches, collaboration arrangements, joint structures and policy tools supporting capacity for delivering innovation.
- *Beneficiaries:* SMEs, NGOs, Civil Society, Local Authorities, Universities, key sectors and competitiveness clusters, research centres, public stakeholders, social and local services, business sector, chambers of commerce, research centres, civil society

Specific objective 1.2: Increase the delivery of innovation in smart specialisation sectors. Priority Axis 1: Technological and social innovation (TO1, IP 1b)

- *Brief justification:* Exploits the high potential for innovation of the 2 Seas area which is mainly related to existing clusters for smart specialisation, networks of research, possibility of high technology transfer.
- *Main change sought:* Better exploitation of research outcomes and innovation application, specifically in key sectors
- *Expected activities:* Enhancing technology transfer and uptake, in particular by SMEs, testing and developing pilot actions; promoting a closer, more effective and operational cooperation among the key stakeholders of innovation
- *Beneficiaries:* Competitiveness clusters, incubators, business sector stakeholders, regional authorities, chambers of commerce, research centres, technology parks and civil society.

Specific objective 1.3: Increase the development of social innovation applications to make more efficient and effective local services to address the key societal challenges in the 2 Seas area

Priority Axis 1: Technological and social innovation (TO1, IP 1b)

- *Brief justification:* The development of social innovative applications is useful to tackle the challenges related to inclusion themes, and to promote more effective and efficient social support against unemployment, in particular for youth people, poverty and social exclusion.
- *Main change sought:* Development of social innovation addressing challenges related to social inclusion
- *Expected activities:* Exploiting and adopting the results of research; promoting a closer, more effective and operational cooperation between the third sector and social enterprises, private and public sector.
- *Beneficiaries:* Social and local services.

Specific objective 2: Increase the adoption of low-carbon technologies and applications in sectors that have the potential for a high reduction in greenhouse gas emissions

Priority Axis 2.1: Low carbon technologies (TO4, IP 4f)

- *Brief justification:* Low carbon economy is a key issue for sustainable territorial development in all parts of the programme area. The programme partners see an important role for the 2 Seas programme to increase the adoption of low carbon technologies and invest in cross-border actions to pilot and roll out low carbon technologies in the 2 Seas area.
- *Main change sought:* Increased adoption of low carbon tech leading to reduced carbon dependency and GHG emissions
- *Expected activities:* Enhancing the uptake of state-of-the art solutions; testing and demonstration of these technologies and applications to pave the way for their wider uptake; promoting a closer, more effective and operational cooperation of businesses, knowledge institutes and public sector
- *Beneficiaries:* Businesses, research institutes, knowledge institutes and public sector and relevant entities and stakeholders that can directly benefit from the improved services and conditions.

Specific objective 3.1: Improve the ecosystem-based capacity of 2 Seas stakeholders to climate change and its associated water-related effects

Priority Axis 3: Adaptation to climate change (TO5, IP 5a)

- *Brief justification:* Adaptation and preparedness in response to the effects of climate change is an important challenge for the whole 2 Seas programme area. The area's maritime location makes it particularly vulnerable to climate change.
- *Main change sought:* Increasing eco system based adaptation capacity
- *Expected activities:* Develop collective approaches which will be integrated into spatial planning and solutions for environmental and economic resilience and integrated management of coastal zones; improving the coherence and coordination between strategies and actions, and mechanisms for the crossborder exchange of information and data.
- *Beneficiaries:* Local and regional authorities, environmental agencies, emergency services and coast guard centres, universities and research centres and local communities will be among the beneficiaries.

Specific objective 4.1: Increase the adoption of new solutions for a more efficient use of natural resources and materials

Priority Axis 4: Resource efficient economy (TO6, IP 6g)

- *Brief justification:* Achieving an increased adoption of new solutions for a more resource-efficient economy requires the reinforcement of the institutional framework conditions and the capacity of business, public bodies and other stakeholders in society to adopt new models and approaches.
- *Main change sought:* Achieving an increased adoption of new solutions for a more resource-efficient economy
- *Expected activities:* Adopting and implementing collaborative approaches, structures and policy tools for the more efficient use of the natural resources and materials
- *Beneficiaries:* Policy-makers and economic actors in charge of developing and implementing resource efficient policies, strategies and business models are among the expected beneficiaries.

Specific objective 4.2 : Increase the adoption of new circular economy solutions

Priority Axis 4: (TO6, IP 6g)

- *Brief justification:* responds to the identified need of the 2 Seas area to develop resource-efficiency policies and change attitudes of economic stakeholders to more sustainable behaviour.
- *Main change sought:* Achieving an increased adoption of new solutions for a circular economy
- *Expected activities:* adopting and implementing collaborative approaches, structures and policy tools in order to facilitate the transition towards a circular economy.
- *Beneficiaries:* Policy-makers and economic actors in charge of developing and implementing resource efficient policies, strategies and business models are among the expected beneficiaries.

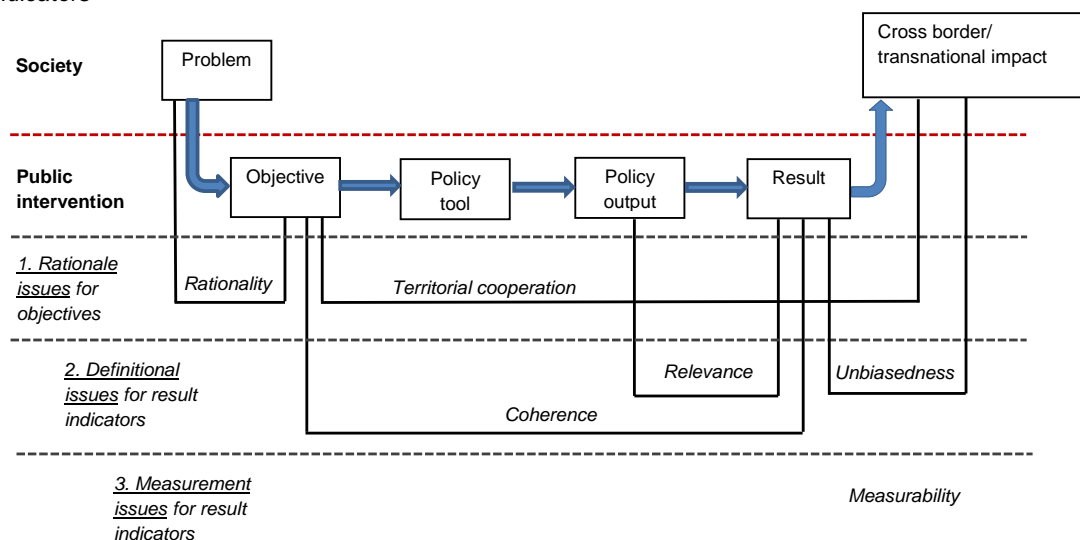
Coherence and Cooperation: Particular attention is drawn to the capacity of ETC to help improve coherence, coordination and alignment with policies affecting maritime regions, including the Atlantic Strategy. The need for coordination with other EU funds is also highlighted.

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
1	Improve the framework conditions for the delivery of innovation, in relation to smart specialisation	Average level of performance of the 2 Seas area with regards to the framework conditions for innovation	HIGH	HIGH	HIGH	MEDIUM - The definition of the result indicator is not fully clear	LOW - Several other factors may influence innovation (sector of specialization, human capital in the region, etc.)	LOW - The definition of the result indicator is not clear: a more precise definition of what is meant by "framework condition" is necessary
1	Increase the delivery of innovation in smart specialisation sectors	Average level of performance of the 2 Seas area with regards to the delivery of innovation in smart specialisation sectors (Number (scale from 1 to 5))	HIGH	HIGH	HIGH	MEDIUM - The definition of the result indicator is not fully clear	LOW - Several other factors may influence innovation (sector of specialization, human capital in the region, etc.)	LOW - How is the innovative performance defined?
1	Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the 2 Seas area.	Average level of performance of the 2 Seas area with regards to the development of social innovation applications (Number (scale from 1 to 5))	MEDIUM - It is not fully clear how social inclusion will be improved by the mean of the activities of the Programme	HIGH	LOW - How does the development of social innovation applications contribute to higher social inclusion?	MEDIUM - The definition of the result indicator is not fully clear	LOW - Several other factors may influence the development of social innovation applications (human capital in the region, level of wealth, etc.)	LOW - How is the innovative performance defined?
4	Increase the adoption of low-carbon technologies and applications in sectors that have the potential for a high reduction in greenhouse gas emissions	Average level of performance of the 2 Seas area with regards to the adoption of low-carbon technologies and applications (Number (scale from 1 to 5))	HIGH	LOW - It is not clear how territorial cooperation contributes to the achievement of the result	HIGH	MEDIUM - The definition of the result indicator is not fully clear	LOW - Several other factors may influence the adoption of low-carbon technologies (availability of energy sources, level of wealth, etc.)	LOW - How is the performance defined?
5	Improve the ecosystem-based capacity of 2 Seas stakeholders to climate change and its associated water-related effects	Average level of performance of the 2 Seas area with regards to the adaptation capacity to climate change and its water-related effects (Number (scale from 1 to 5))	HIGH	HIGH	HIGH	MEDIUM - The definition of the result indicator is not fully clear	LOW - Several other factors may influence the adaptation to climate change (economic specialization, natural assets, etc.)	LOW - How is the performance defined?
6	Increase the adoption of new solutions for a more efficient use of natural resources and materials	Average level of performance of the 2 Seas area with regards to the adoption of new solutions for a more efficient use of natural resources and materials (Number (scale from 1 to 5))	HIGH	HIGH	HIGH	MEDIUM - The definition of the result indicator is not fully clear	LOW - Several other factors may influence the efficient use of natural resources (economic specialization, functional specialization, etc.)	LOW - How is the performance defined?
6	Increase the adoption of new circular economy solutions in the 2 Seas area	Average level of performance of the 2 Seas area with regards to the adoption of new circular-economy solutions (Number (scale from 1 to 5))	MEDIUM - It is not fully clear how this objective is overlapping with the previous one, as both concern the development of resource-efficient policies	LOW - It is not clear how territorial cooperation contributes to the achievement of the result	HIGH	MEDIUM - The definition of the result indicator is not fully clear	LOW - Several other factors may influence the adoption of circular economic solutions (level of wealth, individuals' attitudes, etc.)	LOW - How is the performance defined?

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

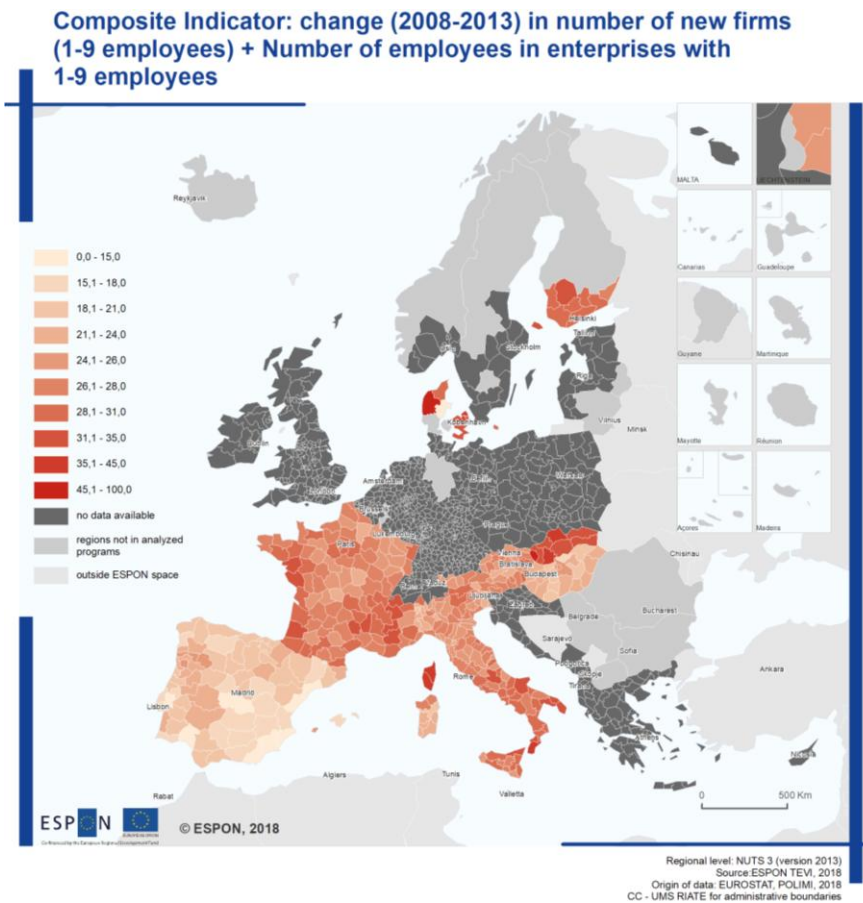
Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

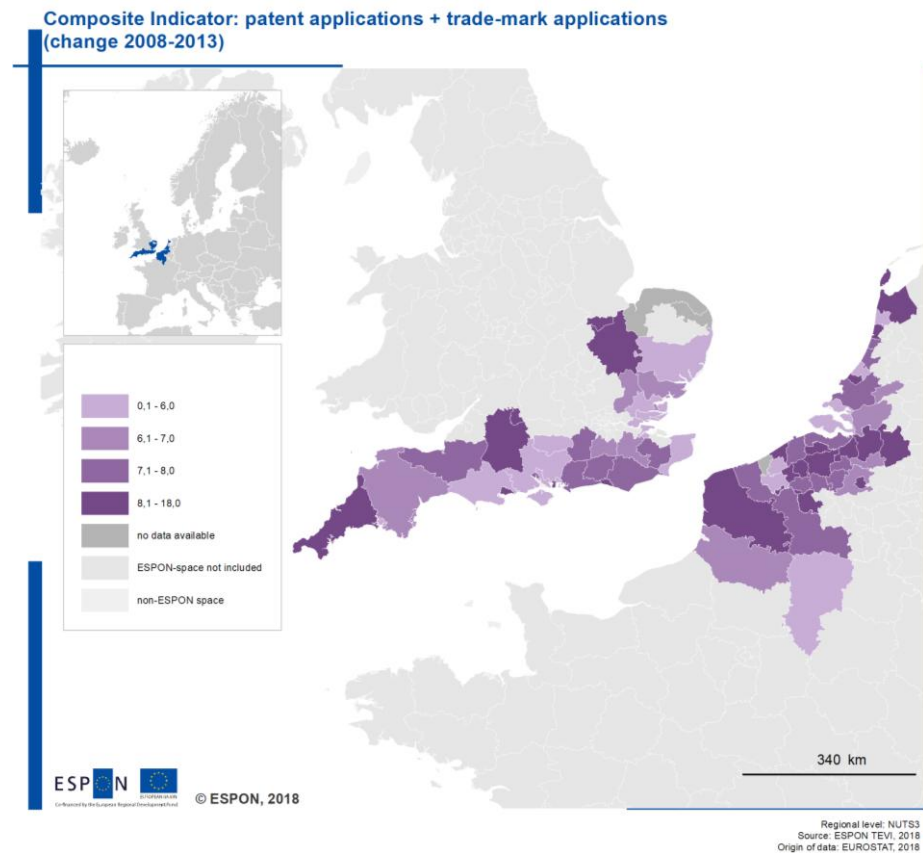
Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Programme	ETC objective	Thematic objective	Specific objective	Output indicator	Result indicator	Proposed result indicator
Two seas (1)		1	Improve the framework conditions for the delivery of innovation, in relation to smart specialisation	O1: Number of joint strategies and action plans developed to improve the framework conditions for innovation (Number) O2: Number of networks and structures established or enlarged to improve the framework conditions for innovation (Number) O3: Number of solutions (methods/ tools/ services) established to improve the framework conditions for innovation (Number)	Average level of performance of the 2 Seas area with regards to the framework conditions for innovation	Synthetic indicator: human capital in the region + Framework Programme participation + number of employees in R&D
Two seas (2)		1	Increase the delivery of innovation in smart specialisation sectors	O1: Number of tests, pilots, demonstration actions and feasibility studies implemented related to the delivery of technological innovation (Number) O2: Number of small scale physical or e-infrastructure/ equipments related to the delivery of technological innovation partly or entirely supported by the operations (Number) O3: Number of research institutions participating in cross-border, transnational or interregional research projects (Number) O4: Number of enterprises participating in cross-border, transnational or interregional research projects (Number)	Average level of performance of the 2 Seas area with regards to the delivery of innovation in smart specialisation sectors (Number (scale from 1 to 5))	Synthetic indicator: number of patent applications + number of scientific publications + number of citations (by theme/ sector) + Framework Programme participation
Two seas (3)		1	Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the 2 Seas area.	O1: Number of tests, pilots, demonstration actions and feasibility studies implemented related to the development of social innovation applications (Number) O2: Number of small scale physical or e-infrastructure/ equipments related to the development of social innovation applications partly or entirely supported by the operations (Number) O3: Number of research institutions participating in cross-border, transnational or interregional research projects (Number) O4: Number of enterprises participating in cross-border, transnational or interregional research projects (Number)	Average level of performance of the 2 Seas area with regards to the development of social innovation applications (Number (scale from 1 to 5))	Synthetic indicator: number of IP+ households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Two seas (4)		4	Increase the adoption of low-carbon technologies and applications in sectors that have the potential for a high reduction in greenhouse gas emissions	O1: Number of solutions (methods/ tools/ services) established to increase the adoption of low carbon technologies (Number) O2: Number of tests, pilots, demonstration actions and feasibility studies implemented related to the adoption of low-carbon technologies (Number) O3: Number of small scale physical or e-infrastructure/ equipments related to the adoption of low carbon technologies partly or entirely supported by the operations (Number)	Average level of performance of the 2 Seas area with regards to the adoption of low-carbon technologies and applications (Number (scale from 1 to 5))	Synthetic indicator: CO2 emissions + N2O emissions

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge Intensive Industries

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined time period. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t . Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. A minimum of 0.2 can be observed in Northern Flemish regions, with corresponding maximum of 147,8. Maxima are found along urban centres, for example NUTS-3 regions around London, South Holland and the Franco-Belgian border.

In particular, higher values are found around the conurbation around Rotterdam in Holland, Antwerp and Ghent in Belgium, the Nord Region of France, and parts of Essex, Cambridgeshire and Surrey in England. These areas all contain, or are near, major European conurbations, e.g. Rotterdam, London. The areas are densely populated with high concentrations of highly skilled working age populations, centres for education and research, and high concen-

⁶nama_10r_3gva

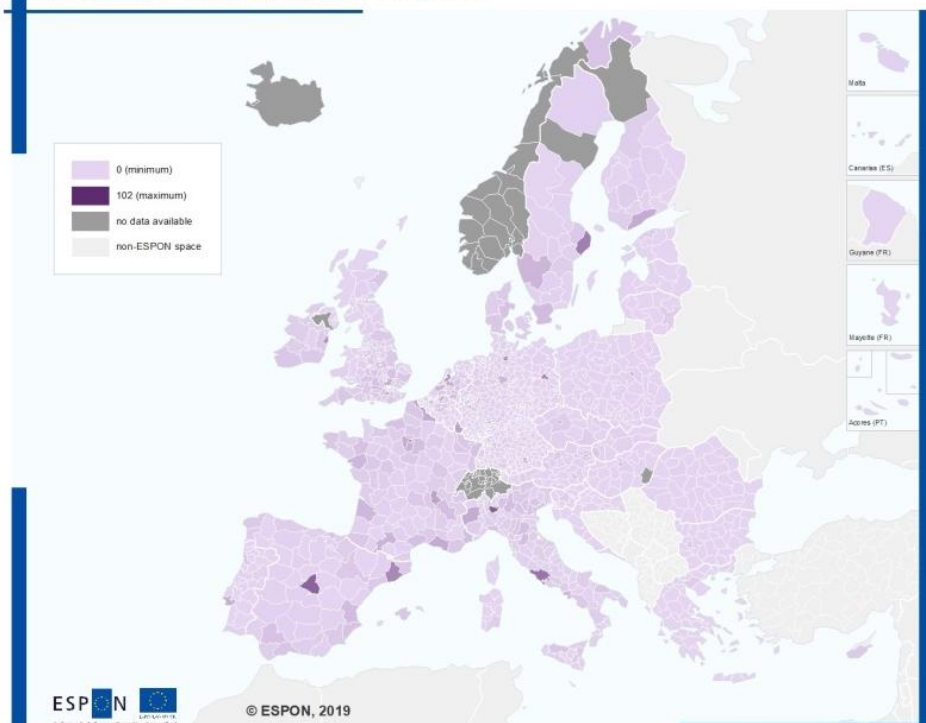
⁷nama_10r_3empers

trations of R&D/knowledge based industries and the service sector. The dependence of knowledge-based industries on human capital reinforces the link between centres of population and these sectors. The regions also have specific sectoral strengths, e.g. automotive sector in the Nord region of France, biotechnology and high-tech industries in Cambridgeshire, and port and chemical industries in Antwerp, which have important knock-on benefits for associated industries, innovation and start-ups.

The 2 Seas Region is reflective of a wider patterns across North West Europe, which has a numbers of mid-value regions and some of notable concentrations of high value areas in/around major urban areas. The synthetic indicator appears to show comparatively low levels across much of the EU, which makes the achievements of the higher performing regions in the 2 Seas region all the more notable.

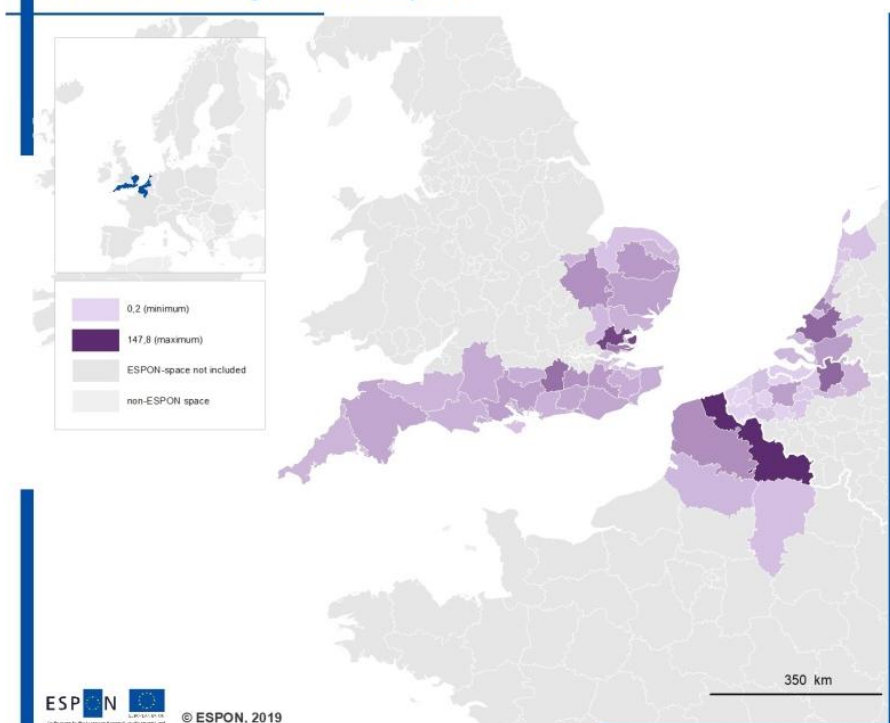
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR
 © UMS RIATE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR

4.2 Innovation

The maps below present the synthetic composite indicator *Innovation* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Innovation in the framework of the indicator is restricted to technical innovation via patent and trademark registration, thus not necessarily reflecting the status of social innovations. The composite indicator quantifies the innovation outputs undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework innovative economic activities. The indicator is calculated in the following manner:

$$Innovation = \frac{1}{2} * P_{i,t} + \frac{1}{2} * T_{i,t}$$

In which the variable $P_{i,t}$ represents normalised patent application values per NUTS-3 region to the European Patent Office in region i and at time t . Analogously, $T_{i,t}$ represents normalised trademark applications in a given region i and at time t . Thus, the indicator captures scientific and technical innovation, in addition to capturing process innovation via new products and similar by companies. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Trademark values on NUTS-3 level are obtained via the indicator European Union trade mark (EUTM) applications by NUTS 3 regions⁹.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 1.3 can be observed in Northern Flemish regions, with corresponding maximum of 102.4. Maxima are found along urban centres, for example NUTS-3 regions around London, Antwerp and the region of Holland. In these areas, particularly Cambridge, Hampshire, Surrey, West Noord Brabant, Antwerp, Zeeuwsch-Vlaanderen, and the Nord region, there are high numbers of international centres of R&D excellence, concentrations of further and higher education establishments and clusters of economic expertise and knowhow. For example, Cambridge is the fastest growing city economy in the UK, with indus-

⁸ tgs00041

⁹ ipr_ta_reg

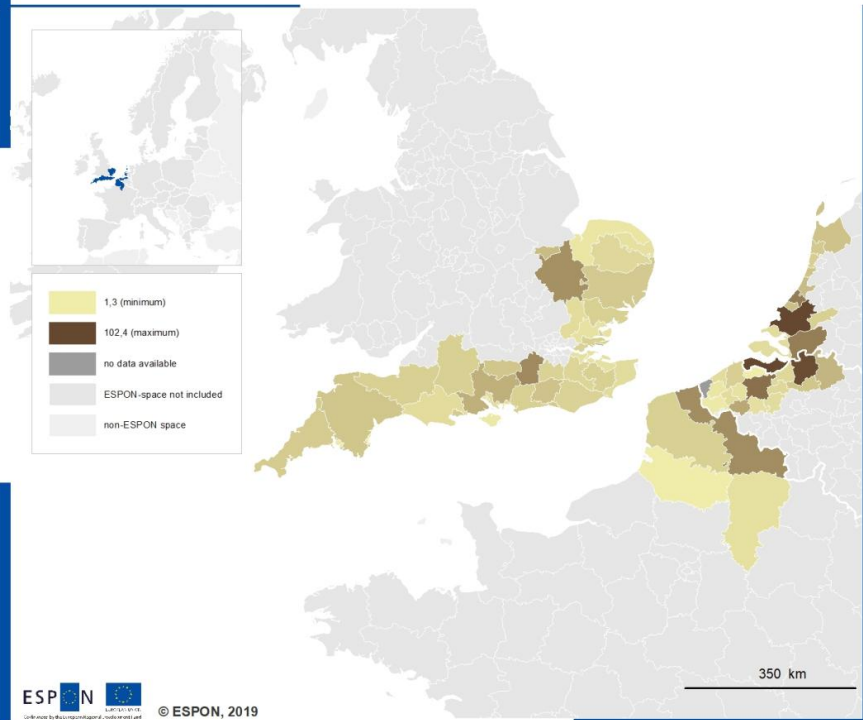
trial parks and concentrating in a variety of sectors including, wireless technology, display technology, and mobile telecommunications.

In RIS performance groupings, many of these areas rate amongst the innovation leaders and have above EU average patent applications. As with other regions in the 2 Seas area, the region also benefits from its proximity to major cities and markets. The different levels in innovation measures link, in part, to the different roles of knowledge intensive industries across the region, with levels of knowledge-based industries linking to innovation performance ratios.

Other parts of the programme area have mid-level values, particularly in the South of England and Netherlands, reflecting high levels of economic activity, concentration of higher value added sectors and levels of R&D. Lower values are noted in the Somme area of Picardy in France. This area has experienced higher levels of unemployment, lower levels of qualifications in the workforce.

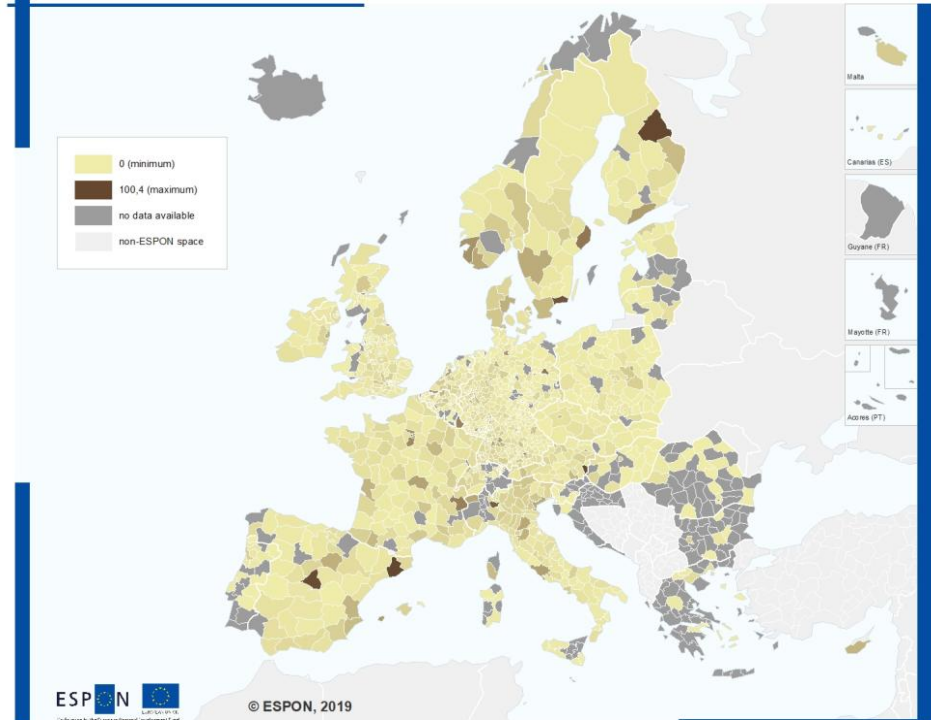
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, Politi, CIR

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, Politi, CIR
 © UMS RIATE for administrative boundaries

4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies the development in tourism and sustainability undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations and inverted. The indicator stems from Eurostat and is available in monthly intervals at national level¹⁰. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹¹ is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹². This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 0.9 can be observed with corresponding maximum of 119.4. Minima are found in parts of Flanders and along the Channel. Maxima are found along in Southern Netherlands (Limburg) and Southend-on-Sea.

The 2 Seas are has lengthy coastlines which are highly diverse. Areas around major ports are hubs for transport and industry. However, in other parts of the programme area the high quality of the natural environment attracts tourism and are the focus of environmental protection

¹⁰ tour_occ_nim

¹¹ Source: EEA, DG REGIO

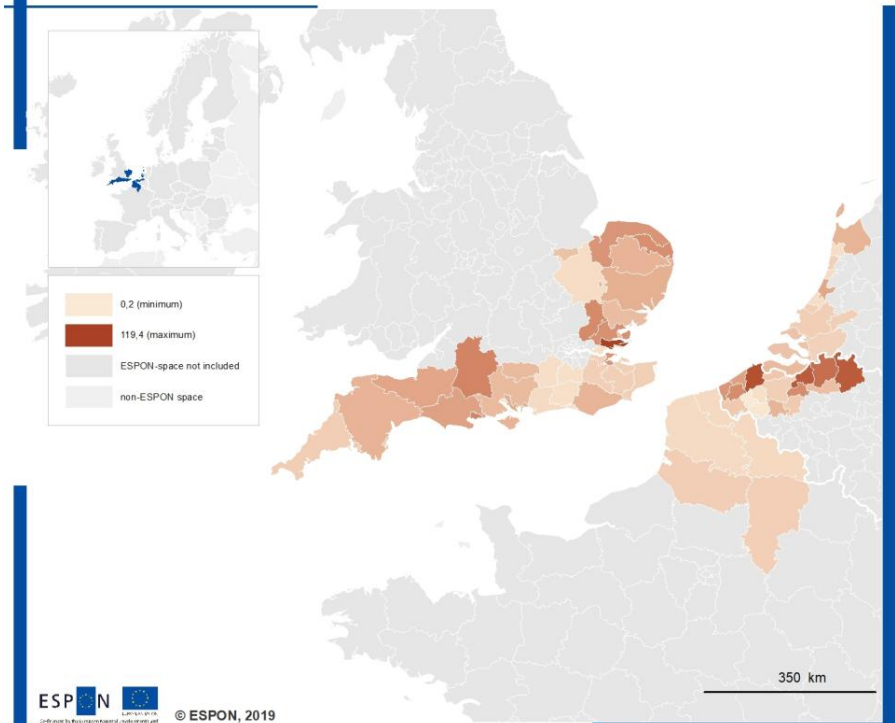
¹² tour_occ_anor2

efforts, e.g. the Norfolk coast. A number of sea-side resorts explains high values recorded for areas, such as South-end on Sea, Bournemouth and Poole. Also, historical cities such as Brugge and Antwerp attract high levels of visitors. The area's natural and cultural heritage is a major attraction for tourism. However, tourism also puts pressure on the natural and cultural resources.

Lower levels in other areas of the Programme reflect densely populated, urbanised and industrial regions, where the natural environment is under pressure from population growth and urbanisation and access to NATURA 2000 sites is more limited (less than 10% in most of the programme area territories). This means that compared to EU averages some regions, especially in the South of England, indicator levels are low. Protection and preservation of coastal and low-lying areas against the effects of climate change, particularly flooding and extreme weather are particular concerns in this area.

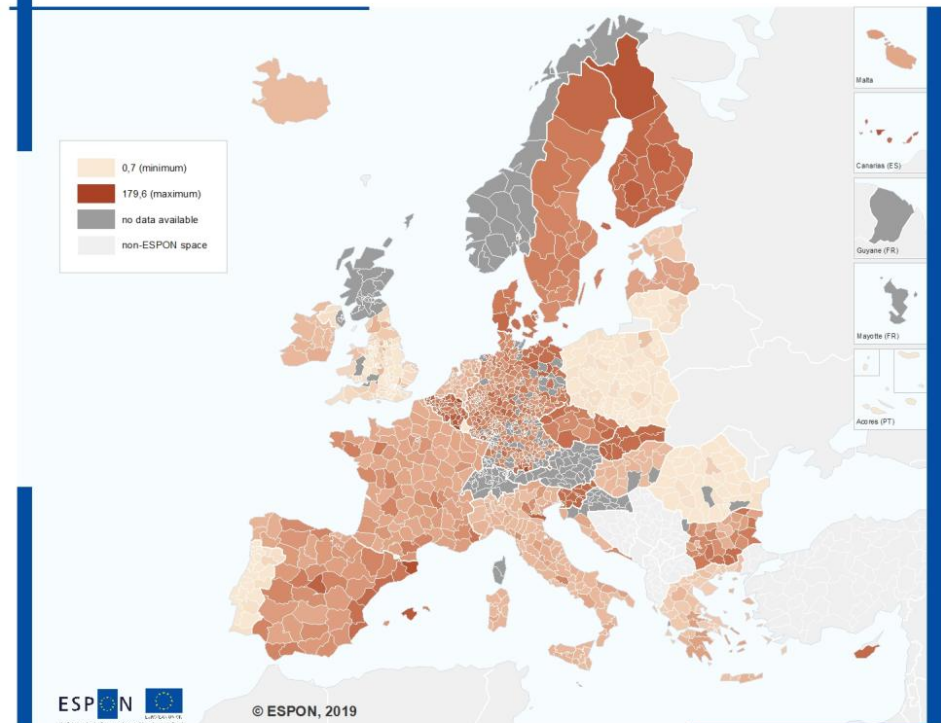
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Poitelli, CIR

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions

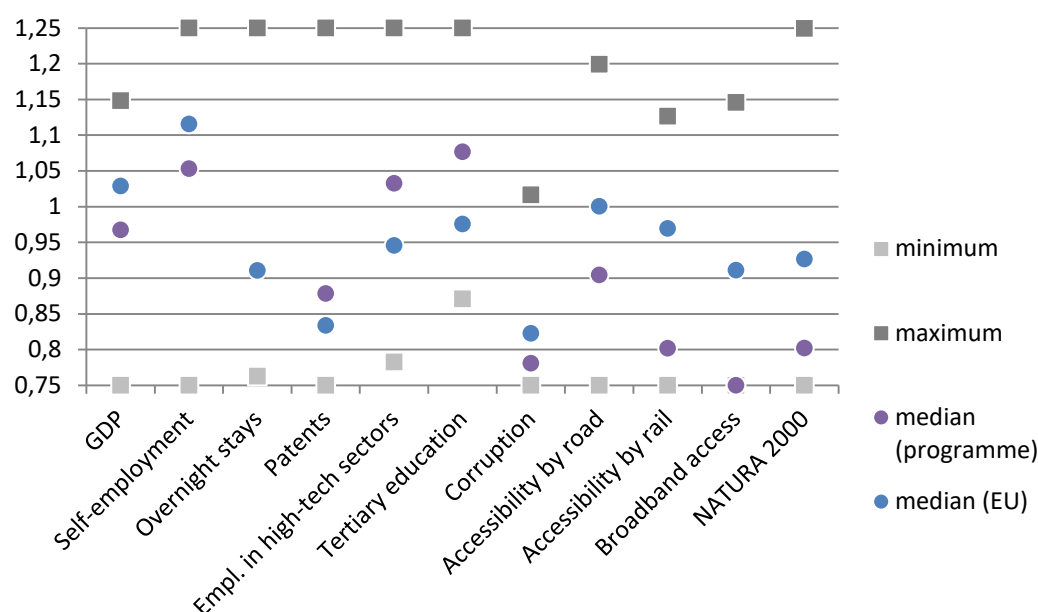


Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Poitelli, CIR
© UMS RIATE for administrative boundaries

4.4 Regional Scoreboard

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The 2 Seas Programme Area performs relatively well in the absence of corruption, as well as share of people with tertiary education, patent generation and employment in high technology industries. A relatively large range of values across the programme regions is observed over the majority of presented indicators, especially in patent registrations, self-employment. In some cases, the Programme Area is performing worse than EU average, namely in broadband access and NATURA 2000 habitats. These measures reflect the diversity within the programme area, which includes highly urbanised conurbations and clusters of industry, as well as more rural and coastal areas. Aspects where Programme area performs less well, and

below EU averages, are accessibility by road and rail, broadband access, and access to NATURA 2000 area.. This overall trend picks up on weaknesses, particularly in the more rural areas, e.g. increasing digital accessibility is a major issue in several, mostly rural, regions. Multimodal accessibility highest in urban zones of 2 Seas area, In contrast, in Bretagne and Finistère a development focus is on the creation of high speed networks. The roll-out of broadband connections in the UK is a measure to stimulate economic growth in rural areas.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

	Strengths	Weaknesses	Opportunities	Threats
Strengthening research, technological development and innovation	Some regions' expenditure on R&D higher than the EU2020 target Above average employment in high tech sectors Innovation leaders Strong R&D performance Robust social economy/public sector International connectivity	Low average number of patent applications Low performance of SMEs in R&D Concentration of activity/investment in key areas Engagement between SMEs and R&D On-going public sector budget cuts and associated impact on R&D investment and funding Impact of Brexit on innovation cycles and cross-border exchanges	Refocusing R&D on major societal challenges including migration and urbanisation Achieving critical mass for innovation in "niches" like blue economy Potential targeted innovation policy and cluster development Public service innovation addressing new challenges, e.g. migration Support SME/innovation link	Impacts of public sector cuts Outsourcing of R&D to low cost countries Shortage of key skills/personnel Brain drain/demographic change Competition within the area in specialist areas Impact of Brexit on cross-border exchanges
SME competitiveness	Start-ups and SMEs contribute to a large extent to the economic performance of the programme area	Economic uncertainties remaining from the economic crisis and linked to Brexit. Ensuring R&D SME links	Coordination of initiatives Maximising synergies and complementarities Capacity to keep up with changing markets and opportunities Adaptation to new environmental standards/demands International engagement	Impact of Brexit Brain drain demographic change

In this field many of the key issues remain as they are long-term development challenges for the Programme Area, e.g. building and maintaining critical mass in rapidly changing, dynamic R&D fields, the need to work to attract and retain high skilled workers, supporting R&D business/SME links, supporting innovation in public sectors. Key sectors remain those linked to blue growth, low-carbon economy, bio-tech, environmental technologies and renewables. However, in the current period and looking to the next, these challenges have been amplified by the prospect of Brexit and the uncertainties around it. For R&D/Innovation and SME development, a significant change in border relationships will have a major impact on cross-border exchanges, impacting on market access, import of products and services, disrupting productive working relationships and networks, pressure on development in some highly developed areas in some cases, loss of investment in others.

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strengths	Weaknesses	Opportunities	Threats
Promotion of renewable energy and energy efficiency	<p>Considerable potential for renewable power generation</p> <p>Specific regional policy in place to reduce GHG emissions and achieve energy efficiency gains</p> <p>“Water and energy” and “Environmental technologies” are smart specialisation sectors for numerous local areas</p>	<p>High level of carbon emissions per capita</p> <p>Renewable energy production behind schedule in all regions</p> <p>Energy efficiency gains in some areas behind on 2020 target</p>	<p>Development of offshore wind farms and associated technologies and support systems.</p> <p>New forms of renewable, i.e. (high) potential for tidal energy, wave energy</p> <p>Emerging biotech and low-carbon technologies as smart specialisation sectors</p> <p>Greenhouse-gas reduction in agriculture</p> <p>CO₂ reduction</p> <p>Carbon capture and storage in exhausted oil and gas fields</p> <p>Opportunities capacity and demand for eco innovation</p>	<p>Low acceptance of decentralised energy production</p> <p>Shift away from oil and gas</p> <p>Low investment level due to economic situation</p>
Action to address climate change	<p>Relatively high adaptive capacity with regard to climate change</p> <p>policy focus on GHG emissions reduction and renewable energy;</p> <p>Actions to address climate change adaptation</p>	<p>High economic sensitivity to climate change</p> <p>High environmental sensitivity, e.g. risk of flooding</p> <p>.Highest risk on coastal flooding</p> <p>Relatively low capacity to adapt to climate change in some areas</p>	<p>Common information sharing environment between maritime authorities</p> <p>Cross-border exchanges in marine spatial planning, including legislative measures and risk management policy</p> <p>Collective mitigation measures</p> <p>Development of scenario planning for cross-border disasters</p> <p>Integrated management of coastal and cross-border environmental zones</p> <p>Moderate to serious drought and floods in some parts of the area</p> <p>Opportunities capacity and demand for eco innovation</p>	<p>Climate change, in particular the rise of sea levels, acidification, increasing water temperatures, and frequency of extreme weather events, is likely to alter marine ecosystems</p> <p>Low awareness of the impact and risks of climate change</p> <p>Increase of natural risks due to the effects of climate change</p> <p>Vulnerability to climate change (higher than EU27) in particular for some economic sectors (agriculture, forestry, tourism, energy sector) and in Flanders</p>

	Strengths	Weaknesses	Opportunities	Threats
Environmental quality	Diverse natural and built environment Rich cultural, natural and historical heritage Quality of Marine and coastal environments Increase in recycling High tourism capacity- levels in the UK- regions, average above EU-level	Weak cooperation between ports on environmental issues Coastal zones with high concentrations of marine pollution Estuaries with large biodiversity threatened by polluted river water and invasive species Low rate of Natura 2000 land surface High development pressure on landscape and nature; loss of biodiversity natural and cultural heritage	Increase cooperation for biodiversity protection and connection of natural habitats Promote integrated management of coastal and cross-border environmental zones Develop resource-efficiency policies, and changing attitudes of economic stakeholders to more sustainable behaviour Strengthen the economy and environmental quality by developing the "Blue economy" and "green tourism" + Blue growth Development of environmental technologies, resource efficient economy Promote sustainable agriculture and fisheries Network approaches, connecting Natura 2000 areas Growth in environmental and heritage tourism	Effects of climate change, such as rising sea water level, on biodiversity, ecosystem services and economic activities (Climate change North Western Europe scenario (ESPON CLIMATE project) Increase of pollution, poor water quality, which can affect biodiversity, natural and cultural heritage, ecosystems Fresh water supply concerns, in particular in UK and Zeeland, South Zuid-Holland Increase of over-exploited fish stocks (Air, water and noise) pollution affecting urban environment negatively

For sustainable growth the 2 Seas Programme area covers a wide range of diverse areas with a variety of needs, from highly urbanised areas, rural hinterlands, and coastal regions. There are common issues that can be addressed, e.g. the ongoing need to increase the use and acceptance of renewable energy and low carbon solutions, and opportunities for eco-innovation. There are also opportunities for the specific needs of locations within the 2 Seas area to be addressed, e.g. through joint working on coastal regions, management of wetlands etc. The common marine and maritime links shared across the programme area are a major resource for promoting territorial cooperation, with the pressures faced in the North Sea region, linked to balancing blue growth opportunities with environmental protection and conservation, adapting to climate change, managing flood risks etc. common development concern. Brexit is again a major concern in that developing shared responses and approaches may be more challenging. However, it could make having a vehicle for managing and structuring cooperation, maintaining relationships and linkages all the more important.

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

	Strengths	Weaknesses	Opportunities	Threats
Population/ demographics	<p>Population growing in some areas</p> <p>Central location within Europe and included the economically important areas of the Randstad and the Flemish Diamond.</p> <p>Proximate to London and the German Ruhr-area (export)</p> <p>The area is one of the most populated areas of Europe</p> <p>Above EU-average GDP-levels in predominately urban areas</p>	<p>Share of older people higher than EU average, high old age dependency expected</p> <p>Areas of shrinkage and ageing in rural regions</p> <p>Youth out migration from rural areas</p> <p>Sharp divisions in GDP within large urban areas and between urban and more rural areas</p> <p>Pressure on public services</p> <p>Impact of migration</p>	<p>Opportunities to share approaches to address demographic challenges</p> <p>Opportunities in the development of the "grey economy"</p> <p>Innovative approach to community engagement and building social cohesion</p>	<p>Low population growth in rural areas can lead to a loss of facilities and services</p> <p>Pressure of high population density on the environment, infrastructure and housing affordability growth</p> <p>Impacts of public sector cuts</p> <p>Ageing population</p>
Poverty and social exclusion	<p>High GDP levels relative to EU average</p> <p>Rates of people at risk of poverty low compared to EU averages</p> <p>High employment rates in many areas</p> <p>Diverse populations</p>	<p>Relatively high levels of poverty and exclusion in specific areas</p> <p>High development disparities within the area</p> <p>Impact of the migrant crisis</p> <p>Long-term unemployment in some areas</p> <p>High levels of youth unemployment in some areas</p>	<p>Enhancing access to services</p> <p>Innovation in social enterprises</p> <p>Cross border cooperation in service provision</p> <p>Urban and rural regeneration</p>	<p>On-going impact of budget cuts on domestic and public sector spending</p>
Youth unemployment	<p>High levels of tertiary education</p> <p>Comparatively low levels of youth unemployment</p> <p>High levels of skills</p>	<p>Area disparities in youth employment</p> <p>Mis match skills and demand in labour market</p>	<p>Exchange in supporting training</p> <p>Youth SME development</p>	<p>Skills keeping up with the growth of the Knowledge economy</p>
Social Cohesion and migrant communities	<p>Value in diverse communities</p> <p>Strong public sectors</p>	<p>Pressure on local services</p> <p>Social pressures</p>	<p>Cooperation on approach to enhance community cohesion, education and integration</p> <p>Support for training</p>	<p>Differing national approaches taken to accommodating migrants</p> <p>Pressure on service provision</p> <p>As a highly politicised topic, there is the impact of changes in national policy approaches</p>

Overall, the programme area has high levels skills, people in employment and household incomes. However, within the area there can be sharp contrasts, with areas of significant deprivation and social problems, including youth unemployment, long-term unemployment etc. The economic crisis has had a long-term impact on households in some areas and also led to cuts in public services, which have particularly affected socially vulnerable groups. Demographic aging is another area development issue for the programme area with, opportunities potentially arising in terms of innovative responses to service provision for the elderly offering opportunities, but also the pressure on services that an increasingly elderly population posing a concern. Social cohesion and integration is also an issue which has been thrown into sharp focus by debates around the migrant crisis. Areas within the programme area have rich and diverse populations and could have much to offer in terms of shared expertise and experience in this area.

5.1.4 Main Challenge and Needs

Table 5.4: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	R&D innovation capacity Sectoral Strengths Strong SME base High skills level	Links to SMEs Commercialisation of research results Over concentration in a few areas	Development of key sectors including blue growth, bio tech and low carbon/energy efficiency Supporting new emerging sectors Developing new forms support and innovative approaches	Impact of Brexit International competition in key sectors
Sustainable growth	Strong expertise in innovation and R&D Skills in key areas Rich and diverse natural heritage	Resistance to change Sensitivity to environmental change/damage Density of development High levels of emissions	Innovation and R&D potential linked to e.g. low carbon technology, energy efficiency etc Increased institutional and public awareness Innovation and R&D capacity	Impact of extreme weather events Disruption to joint working linked to Brexit
Inclusive growth	Value of diverse communities High levels of educational attainment and skills Strong public service provision	Tensions and pressures on social cohesion Pressure and cuts to services Pockets of youth and high unemployment	Cooperation on approach to enhance community cohesion Exchange in supporting training and business start ups	On-going public service cuts Economic impact of Brexit Loss of jobs in key sectors Skills in key sectors not keeping up with demand

In the 2 Seas region economic performance varies linked to the area's diverse geography (ranging from major economic hubs in the South East of England, Belgium and the Netherlands to the more peripheral, rural South West of England); long-standing economic trends (e.g. high levels of urbanisation and pressure of development to reliance on primary sectors

such as the fishing industry in some regions); and the varying effects of the economic crisis and future impact of Brexit.

Strengths

Many of the regions enjoy high levels of GDP, above EU averages. The regions differ in the extent to which they were affected by the economic crisis. Between 2008 and 2013 many of the regions achieved GDP growth.

The programme area has high population concentrations, include major urban centres, Zuid-Holland (the Hague and Rotterdam), Noord-Holland (Amsterdam), but also more rural areas such as the South West of England. A long standing trend is steady growth of the major urban centres.

In terms of employment much the region exceeds or meet Europe 2020 target rates for employment, although employment rates in Nord-Pas-de-Calais have been below and levels of educational attainment are high.

In terms of the overall structure of the economy primary sectors and manufacturing industry still play an important role. However, there continues to be a shift towards higher-value, knowledge-based and service sector activities, e.g. in professional scientific and technical services, public administration, and hightech jobs. The service sector has continued to grow. The percentage share of GVA from professional and market services increased. Public administration, defence, education, human health and social work are also key pillars of the North Sea Countries' economies. Regionally high levels of R&D expenditure are linked to regional population and specialisation, and are particularly pronounced in areas with particular research clusters and specialism, e.g. East Anglia (high-tech, biotechnology and agri-environment). Amongst the recognised areas of sectoral strength for the North Sea region are fisheries, transport and communications, energy, tourism, environment and health.

The rich natural and physical environment, in particular in rural and coastal areas, means that tourism is an important sector for many rural and coastal communities, as well as in urban centres. Major cities continue to attract large number of tourists. However, in many more rural and coastal areas visitor numbers are also high, making the sector of particular value.

The transport sector is a major contributor to the region's economy. The region hosts international trade and transport hubs, notably sea ports and major airports, as well as smaller regionally important hubs. However, there are significant regional variations. The South Eastern areas have high territorial connectivity to road, rail and airports locations. In the South West of the area, there is a less dense transport network.

Weaknesses

The financial crisis led to job losses in the service industries, though financial and business services and communication are still growth sectors. The number of professional, scientific and technical "units" increased in the majority of the North Sea Regions.

There could be greater levels of R&D expenditure in the business sector and SMEs innovating in-house, patent applications and product or process innovators.

While the area overall has high levels of social care provision and quality of life, there are concentrated pockets of areas of multiple deprivation.

Linked to population change, migration and demographic aging, social cohesion and community development are key concerns.

Population growth in urban areas and demographical aging are placing pressures on public services and transport networks.

Energy transition and dependence on oil and gas is a weakness in the region, particularly due to the high concentrations of urban areas and business activity.

Pollution and high levels of emissions are also concerns, e.g. marine pollution and urban air quality.

Opportunities

Looking forward, the region's capacities in R&D and innovation are keys to pursuing new opportunities linked to both established sectors opportunities and in new fields such as blue and green growth. In addition, the region has extensive global and internal trade and transport links which can be developed and built upon.

The area has extensive natural and physical resources which are a basis for developing new renewable energy sources and technologies.

Better coordination and exchange to help reduce pollution and emissions.

There is scope to cooperate to promote growth and innovation in relation to the blue and green economy. Key to understanding the impacts of the blue economy in the region are the value chains which link to related activities. An example set out by ECORYS (2014) is deep sea shipping – where more than 75% of employment is generated in supporting sectors found in ports and other places (cargo handling, pilotage, warehousing, distribution, etc.).

Green Growth, i.e. seeking to enhance regional competitiveness through more sustainable use of natural resources, preservation of environmental capital and a reduced exposure to a range of external shocks such as climate change and extreme weather events, is another area of potential for the region. The region has concentrations of activity in the “green economy”. Sustainability is an important element for both new and traditional industries such as shipping and port activities which are increasingly focused on the development and adaptation of green technologies.

The demand for new and innovative approaches to delivering public services will promote innovation and new ways to promote social cohesion

Threats

The impact of Brexit is a very major threat to development in the area, linked to economic change pressures (growth in some areas and economic decline in others); pressure and disruption in trade and transport links, challenges to cross border networking and service provision etc.

Transport and pressure on transport links and hubs is a concern

All countries have an advanced system of monitoring and regulating environmental issues.. However, as a highly industrialised and highly populated area, the Region faces considerable environmental challenges and threats, linked to pollution and emissions, the over exploitation of resources and climate change.

Need to retain and build competitive and skilled human resource base in the region. The region need to be an attractive area for people to live and work in order to maintain competitiveness. It also need to maintain key services such as health, education transport and leisure, which are all currently under pressure linked to public sector cuts in many areas and increasing demands linked to, e.g. demographic ageing.

Impacts of climate change are now becoming evident. While the exact nature and rate of these impacts are uncertain, rising sea temperature and increasing acidification represent major threats to marine ecosystems and coastal communities. Assessments taking into account likely impacts, as well as adaptive capacity, however also highlight the vulnerability of densely populated regions along the Dutch coast, vulnerable to project rises in sea levels, and related increases in storm surges and flood hazards.

References

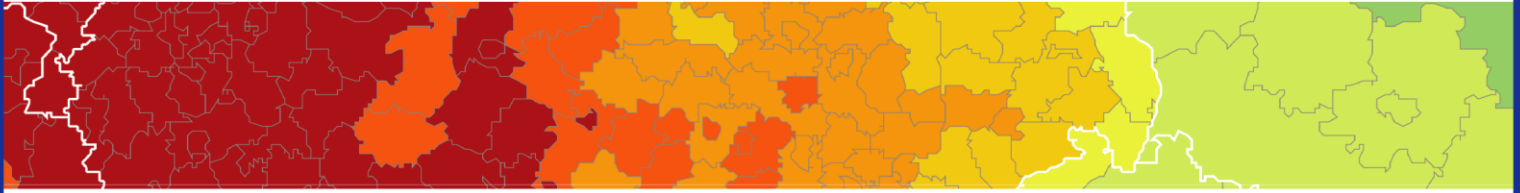
Bureau BUITEN, Economie & Omgeving (BUITEN Consultancy) University of Southampton M&S Advies Chazaud Pascal Consultant (CPC) (2013) FRANCE (CHANNEL) – ENGLAND & 2SEAS AREA SITUATION ANALYSIS AND SWOT Situation and SWOT analysis of the 2Seas and France (Channel) – England Programme area Final report for Region Haute-Normandie, JTS INTERREG IVA Programme France (Channel) - England September 4th 2013

ECORYS etc al, (2014), Study on Blue Growth and Maritime Policy within the EU North Sea Region and the English Channel, Final Report FWC MARE/2012/06 – SC E1/2012/01, Report for DG Mare,

Interreg 2 Seas Programme (2015) Cooperation Programme under the European Territorial Cooperation goal, Adopted by the European Commission on 03 June 2015, Region Nord-pas-de- Calais, <https://www.interreg2seas.eu/en/content/about-programme>

McMaster, I. (2016) North Sea In Numbers, report for the North Sea Commission, EPRC University of Strathclyde

T33 (2015) Two Seas Programme, Final Ex Ante Evaluation Report Up Dated version April 2015, <https://www.interreg2seas.eu/en/content/about-programme>



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

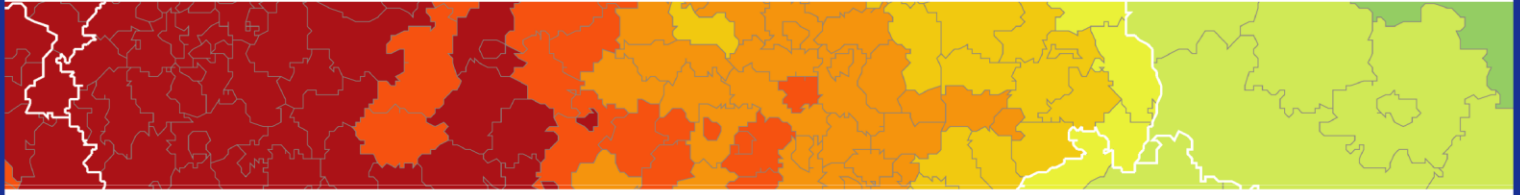
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG A Austria-Czech Republic

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG A Austria-Czech Republic

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview needs and challenges	2
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	4
3 Indicators	7
3.1 Initial result and output indicators used in assessment	7
3.2 Proposed Key Territorial Indicators.....	11
4 Benchmarking.....	14
4.1 Gross Value Added of Knowledge Intensive Sectors	14
4.2 Innovation.....	17
4.3 Regional Scoreboards.....	20
5 Reference Analysis	22
5.1 Territorial specificity of the programme area.....	22
5.1.1 Smart Growth.....	22
5.1.2 Sustainable Growth.....	23
5.1.3 Inclusive Growth	25
5.1.4 Main Challenge and Needs.....	27
References	30

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	7
Figure 4.1: Regional Scoreboard.....	20

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	13
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	16
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors	19

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.....	11
Table 5.1: SWOT Analysis Smart Growth	22
Table 5.2: SWOT Analysis Sustainable Growth.....	23
Table 5.3: SWOT Analysis Inclusive Growth.....	25

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

The programme covers border regions between Austria and the Czech Republic. The region consists of large urban centres (such as Vienna, Linz, and Brno), and a large number of small and medium-sized villages and towns. The programme area covers approximately 6.3 million inhabitants (2013), concentrated in the large urban centres of Vienna (1.7 million) and Brno (379,000).

The border region features structurally underdeveloped regions, including relatively less competitive enterprises and traditional industries, in addition to dynamic regions with highly innovative and creative environment and competitive enterprises. Along the Austrian Czech border, disparities are visible in terms of the productivity of the regions: GDP per capita (at PPP 2010) is approach 135% of EU27 average in Austrian regions, whereas it approached 75% in Czech regions. The secondary sector strongly features traditional industries in rural areas, and more innovation-related and dynamic industries in urban centres. Expansions in the tertiary sector, in both rural and urban areas, are driving the expansion of economic output. In the border region, approximately 3 million people are employed.

The programme volume amounts to € 115,134,844, of which € 97,814,933 stems from ERDF contributions. The remaining € 6,447,627 and € 10,872,324 stem from national public and private co-funding, respectively.

2.2 Contribution to EU 2020 strategy & situation in the programme area

Under *smart growth*, the Austria-Czech programme contributes by promoting skill and innovation-oriented activities. In addition, institutional capacities are improved together with existing cooperation and communication structures.

Under *inclusive growth*, cross-border accessibility is promoted in terms of access to jobs, housing, and services. Legal and institutional frameworks are harmonised, which improves access to cross-border opportunities, be they job-related or seeking legal recourse.

Additionally, under *sustainable growth*, regional economies are strengthened in terms of their resilience towards risks stemming from climate change, as well as contributing to quality improvements of natural and cultural resources.

2.3 Overview needs and challenges

One of the territorial challenges is linked to demographic change, especially in peripheral regions that experience declining tendencies. The region is diversified in terms of economic structure and there can be many disparities observed. Next to dynamic, innovative and strong regions and industries there are also less competitive branches and sectors. Such differences

can be seen between not only between urban and rural areas but also between Czech and Austrian regions. For example secondary sector is still very prominent in rural and Czech areas.

Czech regions need to support innovativeness and competitiveness of their enterprises, implementation of S3 strategies, key enabling technologies, clusters, niches, institutions and research. In Austria, on the other hand, the need is to raise the share of technology and knowledge-based products and services in export activities, as well as the efficiency of governance. R&I investments are concentrated around centres on both sides of the border making it difficult for peripheral regions to benefit from them. Also, SMEs have difficulties with regards to innovation capacities and these are rather found in large companies. The potential role of clusters in the region has so far not been used in the cross-border dimension.

In the area of education and qualification regions on both side of the border aim to reduce school drop-out date. There is also a need for educated skilled personal according to the needs of the labour market and to reduce a gap between the education offered and needed skills. Austria also emphasizes the need for more inclusive employment, improving participation of older employees, women, migrants, young people as well as vulnerable groups. Cross-border cooperation between schools and universities should be strengthened.

As a challenge for the region, the consequences of climate change are identified, in terms of their impact on infrastructure, settlements, economic activities, energy production, and water supply. Water shortages may detrimentally impact urban areas and the agricultural sector. Additionally, despite improved flood protection measures, the risk of flooding continues to exist. Tourism needs to be linked with sustainability in an increased manner. Challenges include preserving natural and cultural resources, minimising the negative impact of tourism on local ecosystems, reducing the season-linked demand fluctuations, as well as increasing the accessibility of tourism, and improving the quality of jobs generated through tourism.

Related to regional governance, institutional and administrative capacities need to be strengthened, in addition to promoting good governance principles. This comes with a reduction of regulatory and administrative burdens, promotions of higher standards of transparency, integrity, and accountability. Challenges for regional cross-border governance systems are identified as bottlenecks impacted by factors such as the enabling environment, policy frameworks, organisational settings, and regulations.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1a: Improved and extended research and innovation capacities

Priority Axis 1: Strengthening research, technological development and innovation (TO1, IP 1a)

- *Brief justification:* selected as research and innovation activities are unequally divided across the region. Rural areas feature low rates of research and investment, while urban areas feature high rates
- *Main change sought:* Improvements in innovation systems due to jointly-used R&I capacity. Increased cooperation in the field of R&I between existing institutions. Economies of scale by sharing of existing capacities.
- *Expected activities:* measures (preparatory studies and planning) for investments in cross border R&I infrastructure, investments into shared cross facilities, support of joint cross border R&I activities
- *Beneficiaries:* public and private R&I institutions, universities and related academic institutions, enterprises, the non-profit sector, and the public sector

Specific objective 1b: Fostering the involvement of enterprises (primarily SMEs) in the innovation system

Priority Axis 1: Strengthening research, technological development and innovation (TO1, IP 1b)

- *Brief justification:* selected for similar reasons as SO1: research and innovation is concentrated on research institutions and similar, while SMEs invest little.
- *Main change sought:* Better integration of enterprises in regional innovation systems. Better connection between universities and research institutions and regional needs, with increased cooperation with enterprises. Increased regional and sectoral diffusion of R&D.
- *Expected activities:* an empowerment of enterprises to pursue innovation, a fostering of information and technical knowledge to improve the economic viability of business partners, integration of enterprises into regional innovation systems, and the promotion of institutional cross border networks
- *Beneficiaries:* public and private R&I institutions, universities and related academic institutions, enterprises, the non-profit sector, and the public sector, chambers and associations

Specific objective 2a: Valorising the region's cultural and natural heritage in a sustainable way

Priority Axis 2: Environment and Resources (TO 6, IP 6c)

- *Brief justification:* selected, as natural and cultural heritage impacts the local quality of living, and as such require adequate protection
- *Main change sought:* Better access, preservation, and protection of heritage sites. Strategic approach to heritage protection which balances economic, social, and environmental needs. Improvements in the potential of soft tourism.
- *Expected activities:* improving accessibility of heritage sites via infrastructure improvements, small-scale investments into tourism infrastructure, as well as measures to protect cross border and regional cultural and natural heritage, and common frameworks
- *Beneficiaries:* public authorities, non-profit actors, R&I institutions, universities and related academic institutions, and chambers and associations.

Specific objective 2b: Increase of ecological stability and improvement of ecosystem services

Priority Axis 2: Environment and Resources (TO 6, IP 6d)

- *Brief justification:* selected to account for increased land use, the negative impacts of climate change, and environmental challenges, such as risks of destabilisation of biodiversity
- *Main change sought:* Coordinated measures to counter landscape transformations. Safeguarding biodiversity via green infrastructure. Better protection of natural habitats. Awareness raising in the local population
- *Expected activities:* investments into green infrastructure, the implementation of NATURA 2000, and the preparation and implementation of joint cross border plans
- *Beneficiaries:* public authorities, non-profit actors, R&I institutions, universities and related academic institutions, and chambers and associations.

Specific objective 2c: Fostering the utilisation of eco-innovative potential of the region

Priority Axis 2: Environment and Resources (TO 6, IP 6f)

- *Brief justification:* selected to support environmentally friendly and efficient technologies
- *Main change sought:* Awareness of the general population and pilot projects and infrastructure in energy efficiency and waste management, as well as research findings on energy efficiency and waste management.
- *Expected activities:* supporting of mechanisms promoting cross-border eco-protection, cross-border projects focussing on energy efficiency, and projects implement and testing innovation in the field of eco-protection
- *Beneficiaries:* public authorities, non-profit actors, R&I institutions, universities and related academic institutions, and chambers and associations.

Specific objective 3a: Extension of common supply of education and qualification activities in order to utilize human resources potential in cross-border region

Priority Axis 3: Human resources development (TO 10, IP 10a)

- *Brief justification:* selected because of the importance of skills, policy, and qualifications play to foster growth and an inclusive environment
- *Main change sought:* Increased cooperation between education institutions and the economic sector, as well as increased integration of SMEs into qualification systems, and common frameworks for education and qualifications.
- *Expected activities:* changes to educational systems to better fit the needs of the joint region, the supporting of activities which further the harmonisation of vocational education systems, and the development of common systemic measures in the field of education
- *Beneficiaries:* educational institutions, universities and related academic institutions, public authorities, non-profit actors, and chambers and organisations

Specific objective 4a: Fostering cross-border cooperation of communities and institutions in joint regions

Priority Axis 4: Sustainable networks and institutional cooperation (TO 11, IP 11a)

- *Brief justification:* was selected to strengthen to existing cross border networks, as well as promoting new ones, in terms of cooperation between organisations, administrative sectors, and citizens
- *Main change sought:* Harmonisation, better coordination of services, planning and activities of administrative bodies and public service providers on both sides of the border. Fostering of intercultural exchanges to promote integration and cohesion.

- *Expected activities:* improved cooperation within the public sector between regional and local actors, as well as local cohesion activities, and the strengthening of local and regional networks.
- *Beneficiaries:* educational institutions, universities and related academic institutions, public authorities, non-profit actors, R&I institutions, and chambers and organisations

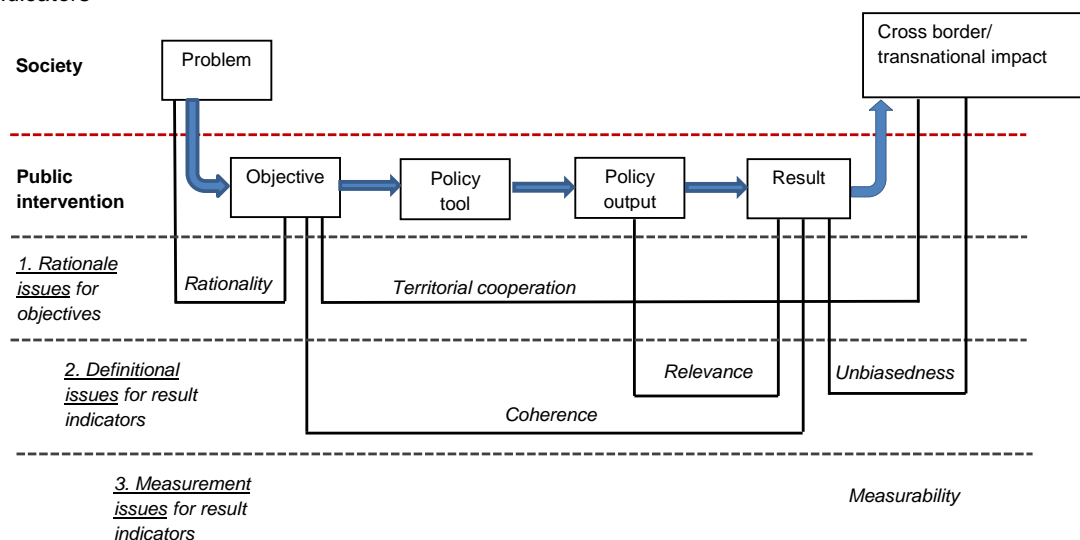
Synergies with other EU interventions: The programme is coordinated in Austria by the Austrian Conference on Spatial Planning (ÖROK) within the Federal Chancellery. Coordination of STRAT.AT 2020 also lies with the ÖROK, thus ensuring complementarity of Interreg AT-CZ with ESI fund-specific activities. A specific working group “Cross-Border-Cooperation” is organised by the ÖROK for the ERDF to assure links to other committees for structural funds.

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
1	Improved and extended research and innovation capacities	Research quota (%) The research quota is defined as the relation of R&I expenditure to the GDP	HIGH	HIGH	HIGH	MEDIUM - The definition of the result indicator is not clear	LOW - What is measured by the result indicator?	HIGH
1	Fostering the involvement of enterprises (primarily SMEs) in the innovation system	R&I expenditure in the business sector in % of GDP (%)	HIGH	HIGH	HIGH	HIGH	LOW - SMEs investments in innovation activities is influenced by several other factors (sectoral and functional specialization, etc.)	HIGH
6	Valorising the region's cultural and natural heritage in a sustainable way	Overnight stays in the region (Number)	HIGH	LOW - It is not fully clear how territorial cooperation will help achieving this result	LOW - Tourism could generate an excessive pressure on the cultural and natural heritage	HIGH	LOW - Tourism is influenced by several other factors (cultural and natural assets, physical accessibility, etc.)	HIGH
6	Increase of ecological stability and improvement of ecosystem services	Share of weighings for categorie 4 and 5 measuring the quality of environment and ecosystem services (%), created on the basis of a survey organised by the MA and the programme partners in February 2015.	MEDIUM - This objective is partially overlapping the previous one	LOW - It is not fully clear how territorial cooperation will help achieving this result	HIGH	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
6	Fostering the utilisation of eco-innovative potential of the region	Share of weighings for categorie 4 and 5) measuring the level of eco-innovation (%), created on the basis of a survey organised by the MA and the programme partners in February 2015.	HIGH	HIGH	MEDIUM - Among the objectives there is general awareness about waste management, which is not mirrored by the result indicator	MEDIUM - The definition of the result indicator is not clear	LOW - What is meant by "eco-innovation"?	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
10	Extension of common supply of education and qualification activities in order to utilize human resources potential in cross-border region	Joint education activities and qualification supply (Number)	HIGH	HIGH	HIGH	LOW - The result indicator is capturing an output rather than a result	HIGH	HIGH
11	Fostering cross-border cooperation of communities and institutions in joint regions	Share of weighings for categorie 4 (above average) and 5 (intensive) measuring the level of cooperation/ integration (%)	HIGH	HIGH	HIGH	MEDIUM - The definition of the result indicator is not clear	MEDIUM - Cooperation and integration could be influenced by other factors not under the control of the policy makers (national and supranational agreements, etc)	LOW - The level of integration and cooperation is difficult to be measured

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key social challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

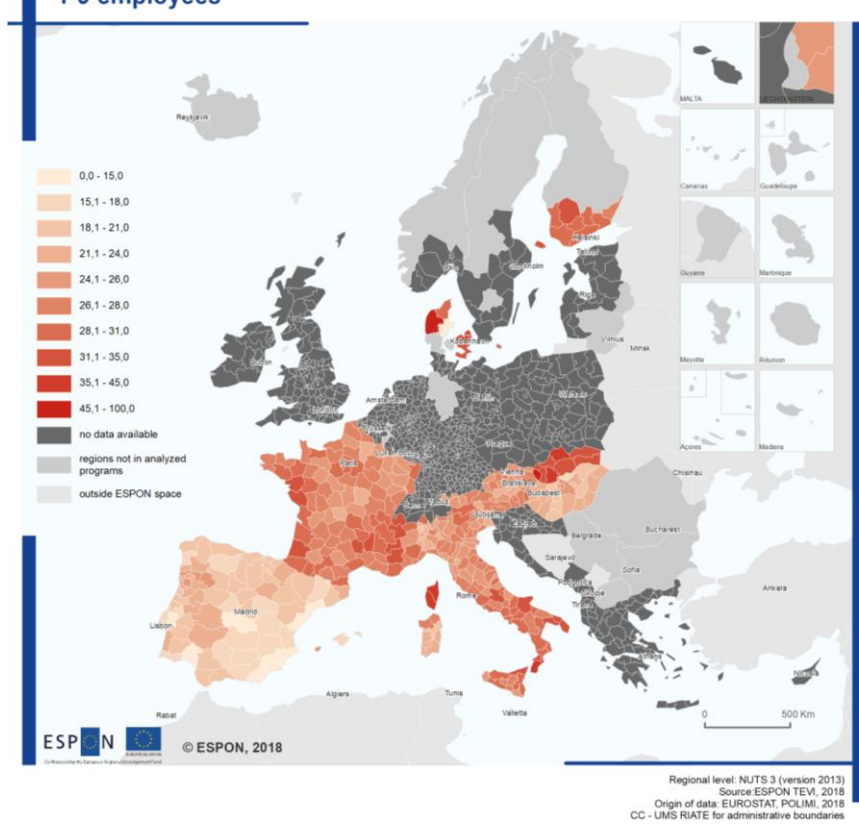
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Output indicator	Result indicator	Proposed result indicator
O1: Number of cultural/ natural heritage elements with improved attractiveness (Elements) O2: Number of cross-border mechanisms to ensure joint management of common heritage (Mechanism) O3: Number of newly built/ improved elements of public touristic infrastructure (Elements) OO1: Total length of reconstructed or upgraded roads (km)	Overnight stays in the region (Number)	Synthetic indicator: tourism presences + seasonality + Natural sites in good conditions
O1: Number of eco-innovations introduced in the cross-border area (Eco-innovations) O2: Number of cross-border mechanisms in the field of eco-innovations (Mechanism)	Share of weighings for categorie 4 and 5) measuring the level of eco-innovation (%), created on the basis of a survey organised by the MA and the programme partners in February 2015.	Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors
O1: Number of cross-border mechanisms to promote joint training and education (Mechanism) OO1: Number of participants in joint education and training schemes to support youth employment, educational opportunities and higher and vocational education across borders (Persons)	Joint education activities and qualification supply (Number)	Unemployment rates of highly-educated workers (to be controlled for other influential factors through DID)

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



4 Benchmarking

4.1 Gross Value Added of Knowledge Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined timeperiod. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. A minimum of 2.6 can be observed in Lower Austria along the Czech border. A corresponding maximum of 130.2 can be observed in Vienna. Maxima are found along urban centres, for example NUTS-3 regions Vienna, Brno and Linz. However, in the European context, the programme area, as many areas, does not stand out. This is due to high values observable in very few regions making less subtle difference in indicator value insignificant. Within the European context, developments in gross value added, as signified with increases in output (due technological development) and employment (in knowledge intensive sectors), is concentrated on urban regions, generally capital regions. Within this

⁶nama_10r_3gva

⁷nama_10r_3empers

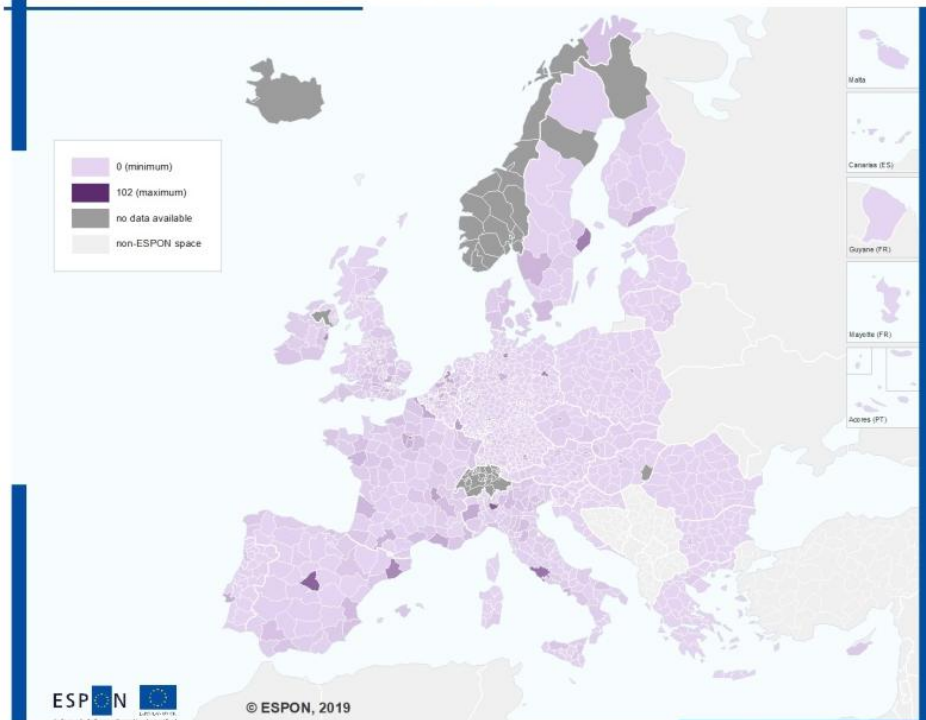
context, centres of excellence in the programme area (such as Vienna and Brno) do not strike out particularly, signalling that developments in technological progress within the economy have generally occurred in different regions in Europe.

Developments in terms of innovative capacity are heterogeneously allocated throughout the programme area. Key centres of innovative activities are found in relatively more urbanised areas of Brno, Vienna, and around Linz (Innviertel). These urbanised areas act as regional centres of excellence and amplify regional disparities by attracting relatively more investments. It is interesting to note that in these illustrations, the universities located in Brno and Linz do not provide the region with sufficient boosts to gross value added generation, illustrating that links between public research and development facilities (especially universities and related tertiary institutions) remains underdeveloped. The programme activities have largely been focussed on supporting research at tertiary education facilities, further illustrating the difficulty of involving SMEs and other private actors in R&D.

Recent developments in ICT services also play a significant role to explain the regional disparities observed between relatively more rural and urban areas within the programme area. Investments into ICT technologies are largely undertaken by relatively more successful companies, due to the costs associated with the investments. This can be exemplified by the Innviertel, which boasts a strong basis of SMEs and large companies (Amag, KTM Industries) which have undertaken significant investments over the past years. Additionally, urban centres attract significantly more investments into consumer tech services than rural areas, due to the concentration of potential consumers and existing ICT infrastructure. This is particularly observed in Vienna, which bolsters this process via a large consumer base.

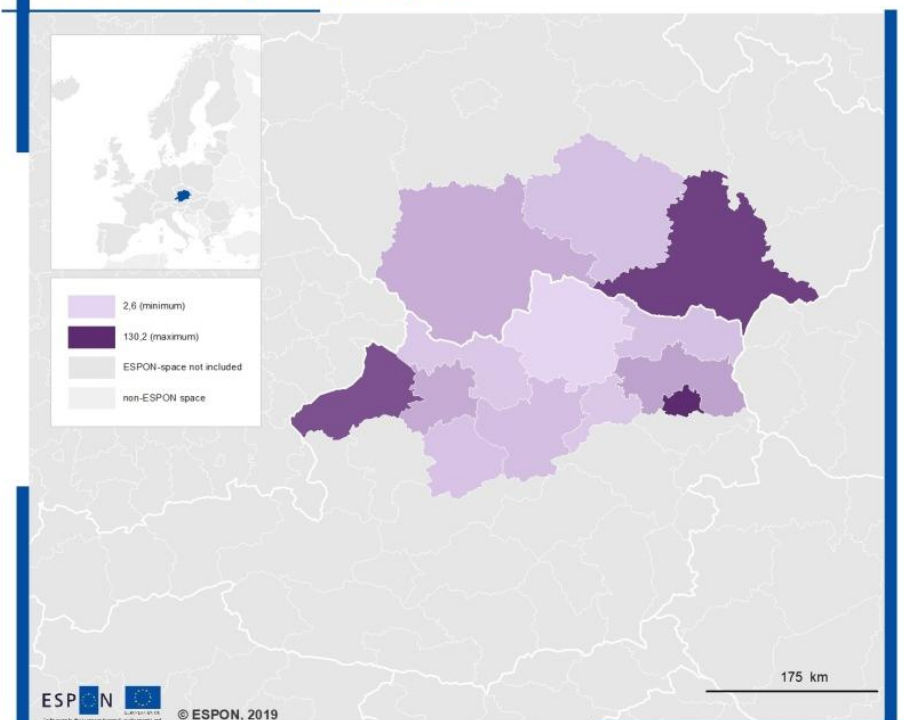
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR
 © UMS RIAE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR

4.2 Innovation

The maps below present the synthetic composite indicator *Innovation* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Innovation in the framework of the indicator is restricted to technical innovation via patent and trademark registration, thus not necessarily reflecting the status of social innovations. The composite indicator quantifies the innovation outputs undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework innovative economic activities. The indicator is calculated in the following manner:

$$Innovation = \frac{1}{2} * P_{i,t} + \frac{1}{2} * T_{i,t}$$

In which the variable $P_{i,t}$ represents normalised patent application values per NUTS-3 region to the European Patent Office in region i and at time t . Analogously, $T_{i,t}$ represents normalised trademark applications in a given region i and at time t . Thus, the indicator captures scientific and technical innovation, in addition to capturing process innovation via new products and similar by companies. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Trademark values on NUTS-3 level are obtained via the indicator European Union trade mark (EUTM) applications by NUTS 3 regions⁹.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 5 can be observed, with corresponding maximum of 105.1. Minima are found in Czech border regions and parts of Upper Austria. Maxima are found predominantly along the Austrian urban centres of Vienna and Linz. Similarly to the example above, these differences fade slightly in the European context which is probably due to high values of few outstanding regions. However, it is of note that the AT-CZ programme area displays a relatively uniform allocation of innovation outputs in comparison to the rest of Europe.

⁸ tgs00041

⁹ ipr_ta_reg

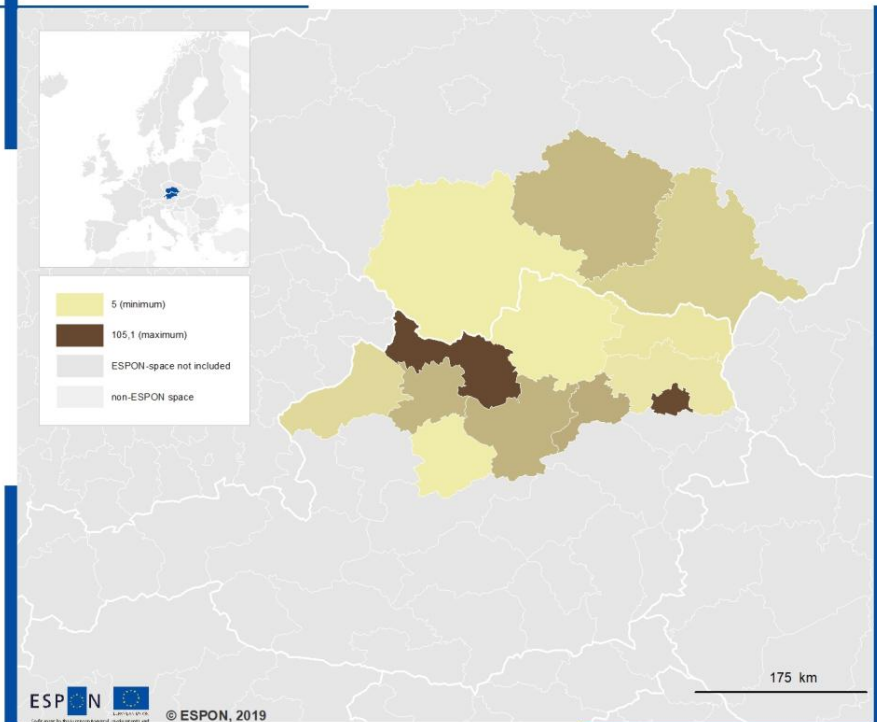
In the European context, innovation (measured by patent and trademark application) is concentrated along urban areas and clusters of R&D institutions. These regions tend to be relatively richly endowed in human capital with strong research institutions. Varying patterns can be identified. In some areas, a concentration of innovative activities to regional centres, generally capital cities, can be observed. This pattern is strongly observable on the Iberian peninsula with regional extrema in Madrid and Barcelona. Surrounding regions of these centres tend to feature a very low degree of innovative output. Another observable pattern are large clusters of regions, featuring moderate to high innovation output. These clusters generally rank in the mid-fields in terms of absolute indicator scores. Examples of these (sometimes large) clusters include Northern Italy (with a regional extrema in Milano and a surrounding cluster of moderately to well scoring regions), the Dutch region of Holland and Southern Germany.

Investigating the programme area in more detail, a higher degree of heterogeneity can be observed. Within the European context (Map 4.1) seems largely homogenous. The heterogeneity of the programme area only becomes apparent in Map 4.2, where the normalisation was undertaken across the programme area as opposed to across all European regions. Lower Austria is characterised by relatively low innovation output, as is Southern Bohemia. In the case of Lower Austria, the economic strength of Vienna, combined with a large number of universities and research institutes, amplifies a concentration of research activities on the capital city. The research landscape of South Bohemia is relatively newer and not as developed, with the University of Budweis only established in 1991. The regions of South Moravia and Vysočina rank in the midfield in the programme area, comparable to the Innviertel.

A second extrema is observable in the Mühlenviertel in Upper Austria with a relatively even distribution of innovation output in the surrounding NUTS-3 regions. This region is characterised with a relatively more homogenous allocation of SMEs and a healthy manufacturing sector. This regional cluster boasts innovative output especially in regards to product innovation.

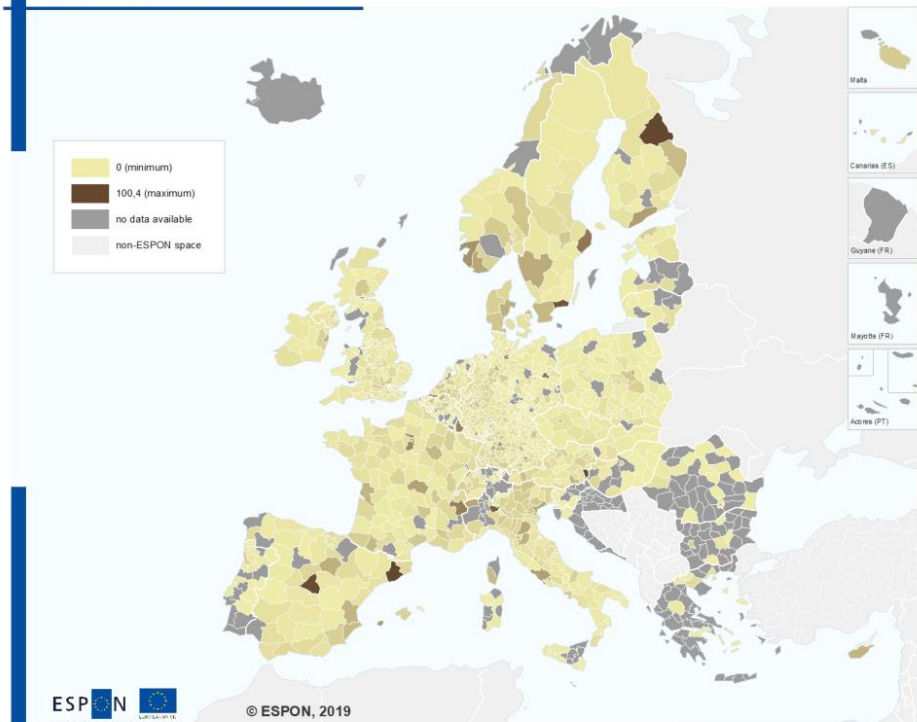
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Patelli, CIR

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors

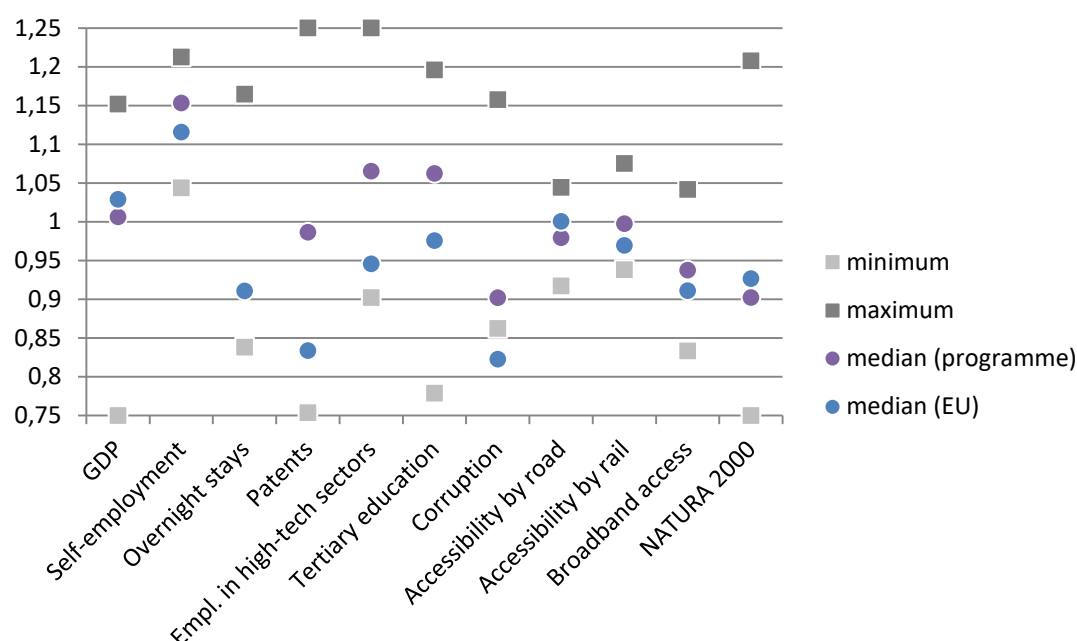


Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Patelli, CIR
© UMS RIATE for administrative boundaries

4.3 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The Austria-Czech Republic Programme Area performs relatively well in the self-employment, patent generation, employment in high-tech sectors, tertiary education, perception or lack of corruption and accessibility by rail, performing better than EU median in every case. In some cases, the Programme Area is performing worse than EU average, namely GDP, accessibility by road and number of NATURA 2000 sites. There is both high and low range of values across the programme regions is observed. High range of values is the case of overnight stays, patents, employment in high-tech sectors, tertiary education and number of NATURA

2000 sites. Lower range of values is apparent especially in self-employment, accessibility by road and rail as well as broadband access.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

	Strengths	Weaknesses	Opportunities	Threats
Research, technological development, innovation	<p>Innovative branches with high value added (biotechnology, nanotechnology, ICT, automotive industry)</p> <p>Programme area attractive to R&D investment: rapid growth of employment in sector</p> <p>High degree of innovative activities in urban centres; established centres of excellence</p>	<p>Insufficient technology transfer between SMEs and R&D actors</p> <p>Disproportionally more R&D spending occurs in urbanised areas than in rural areas.</p> <p>Significant imbalances in terms of R&D spending between Austrian and Czech programme area</p>	<p>Cross-border R&D infrastructure</p> <p>Relatively high percentage (in EU context) of workforce engaged in the high-tech sector, albeit with higher shares in more urbanised regions</p>	<p>Gender imbalances in R&D sector</p> <p>Disproportionally lower R&D expenditure (public and private) and employment on Czech part of programme area may hamper long-term development</p>
Access and quality of ICT	<p>Urban centres boast well developed infrastructure</p> <p>Strong demand for internet-based services from the side of the general population</p>	<p>Divide in broadband access: Austrian regions are lacking behind Czech counterparts</p>	<p>Digital solutions are being embraced by local authorities</p> <p>Effective SME/start-up support structures</p>	<p>Investment into the ICT sector lags behind European average</p> <p>Regional divide: Significantly more investment and employment in urban areas; Czech regions are lagging behind</p>
Competitiveness of SMEs	<p>High share of SMEs with strong sectoral diversity as stabilising factor of the regional economic system</p> <p>Relatively high foundation rate (birth rate) of companies</p> <p>Existence of regional and national support infrastructures for SMEs</p> <p>Generally good access to financing for SMEs across the programme area</p> <p>Well-connected SMEs via international supply chains (especially in secondary sector)</p>	<p>Insufficient involvement and access of SMEs in R&D</p> <p>Shortage of skilled personnel</p>	<p>Well-developed locations and competitive international enterprises</p> <p>High stock of human capital in programme area</p>	<p>Demographic change – aging society and negative impacts on human resources</p> <p>Sectoral transformation of retail sector: retailing is shifting onto online platforms.</p>

The programme area boasts with a healthy macro-economic climate, characterised by low unemployment and positive economic growth. SMEs form the backbone of the local economies, with a relatively high company formation rate across the programme area¹⁰. This improves the overall resilience of the programme area in regards to adverse economic shocks. The existence and formation of SMEs is supported by various national and regional support mechanisms (both from EU and national sources). This contributes to the overall viability of SMEs in the programme area. SMEs are also well-served by a high stock of human capital throughout the programme area.

Centres of excellence, generally in the urban centres of the programme area, feature significant innovation rates, as seen by relatively high inputs (R&D spending, employment in high technology sector) and outputs (e.g. patent registrations). R&D activities, however, are predominantly found in the urban centre of Vienna, painting a stark contrast with other parts of the programme area. Further, difference exist between the Czech and Austrian regions in terms of the extent of R&D activities, with a lower level observed in the Czech districts (Eurostat 2018). SMEs, despite their significant economic contributions to the programme area, generally feature constrained participation in R&D activities. Further, cross-border R&D networks remain limited, providing room for additional growth.

Investments into ICT infrastructure and sector is below the European average in the programme region. Again, a regional divide can be observed, with relatively higher investment and access to related services in the Czech districts than in the Austrian Bundesländer. Especially access to broadband is low in the Austrian part of the programme area, with a near complete penetration in the Czech programme area (Eurostat 2018).

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strengths	Weaknesses	Opportunities	Threats
Low carbon shift	GHG emissions in agricultural sector below European average High and growing share of renewable energy sources in electricity production	Framework for competition in the energy sector GHG emissions from renewable biofuels, particularly wood burning for heating Per capita energy consumption above EU average in programme area Rising electricity demand in parts of programme area	sustainable/low carbon mobility concepts and regional and national initiatives supporting e-mobility are gaining traction	Negative effects of the growing of biomass/energy plants on environment (soil, biodiversity, stability of landscape etc.) Environmental damage from wind and water electricity generation Relatively higher per capita GHG emissions than the European average

¹⁰ Source: EPSON SME

	Strengths	Weaknesses	Opportunities	Threats
Climate change adaptation	Well-developed risk management systems at national levels and experienced emergency services Increased investment in flood management measures.	Decreased accessibility to rescue services in the rural parts of the programme region Low stability of landscape with high potential to natural disasters Different institutional structures/competences: different rescue and risk management systems on both sides (equipment, legislative framework, etc.)	Experiences with joint activities and special projects Region faces overall similar risk profile in terms of natural disasters, thus increasing the efficiency gains from cooperation	Water flows within the programme area are deeply interlinked via downstream outlets. A flood disaster occurring in one part of the programme area, is likely to affect other parts as well. Increasing number of weather extremes recorded throughout the programme area, with more pronounced water supply issues during summer
Environment and resource efficiency	Natural heritage is well protected and relatively widespread (relatively high coverage of Natura 2000 sites). Relatively high ecological awareness of inhabitants and acceptance of renewable electricity sources	Insufficient infrastructure for effective promotion and use of natural and cultural resources Lower per capita recycling rate in Czech regions	Trends in eco-agriculture and preference of local, small producers – positive impact on environment Harmonisation in legal environmental frameworks (e.g. more widespread adoption of common definitions for natural heritage)	Above average levels of soil erosion in programme area, mainly due to intensive agricultural use Expansion rate of settled areas and related infrastructure well above regional population growth rates, especially in urbanised regions. Significant differences in terms of tourism attraction between regions. High rates of tourists may pose harm to natural and cultural heritage.
Sustainable transportation	Well-developed road network in central areas of the programme region Well-developed system of public transportation, especially rail services	Different national and regional strategies in infrastructure and transport policy and low level of coordination of operation of public transport in areas near the border Strong reliance on conventional automobiles as a means of transportation	More widespread adaptation of e-mobility solutions, as well as the provision of suitable infrastructure (charging stations)	Increased pressure on urban centres and conversely rural depopulation leads to transportation demand gaps in rural areas and overcrowding of infrastructure in urban centres.

The effects of climate change can increasingly be observed throughout the programme area. More weather extremes occur, especially heat-related throughout summer. In the long run, this may impact water supply during summer, especially for agro-businesses and industrial companies as large consumers of water. A higher likelihood of weather extremes also carries risks stemming from weather-related catastrophes, such as flooding. The programme area is

especially vulnerable to flooding due to large water masses flowing through the area via the Danube. Upstream flooding can, as such, be easily passed on and affect areas in the programme region. However, Czech and Austrian emergency services are well-trained in addressing the consequences of flooding-related natural disasters. Due to the region facing a relatively similar risk-profile, synergies can be gained from increased cooperation and institutional harmonisation.

The programme area features lower GHG emissions in the agricultural sector than the European average (Eurostat 2018). However, the intensity of the agricultural production may impact biodiversity in the long run. The danger of loss of biodiversity is heightened by an increasing sealing up of surface area, which is occurring at a relatively fast pace in the Austrian programme regions (ÖROK 2017). Even in thinly populated areas, as well as areas marked with population decline, increasing surface area is used up for construction projects (e.g. infrastructure, residential construction).

Renewable sources generate sizeable portions of the consumed electricity in the programme area. This mitigates the detrimental effect of slightly higher per capita energy consumption rates. However, the reliance on biofuels as part of the renewable energy mix contributes to the generation of GHG emissions, as well as pollution stemming from particulates. Electronic mobility solutions (such as electronic cars, electronic buses or electronic bikes/scooters) are growing in uptake, however, this trend is observed relatively more in urban centres. A major counteracting factor are bottlenecks in the infrastructure, namely a lack of coverage of re-charging stations.

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

	Strengths	Weaknesses	Opportunities	Threats
Employment and labour mobility	Well educated and mostly highly specialised labour force Relatively high level of labour productivity Regions at full employment, with steadily declining rates of (structural) unemployment noted in the programme area Institutional and legislative alignment in terms of labour mobility	Cross-border labour mobility hampered due to language barriers High and increasing need to commute to work, and increasing distance of commuting, Labour shortages and difficulties of obtaining skilled workers in many sectors, especially in rural regions	High level of competences of labour market institutions Arrival of working-age migrants may alleviate future demographic shortcomings Start-up funding for entrepreneurs	Ageing population due to demographic change further exacerbating future labour market developments Unemployment rates significantly higher on Austrian programme regions. Slightly higher unemployment observed among women in the Czech part of the programme area, vice versa for the Austrian programme area Shortages of workers with tertiary education in rural areas, due to emigration to urban centres

	Strengths	Weaknesses	Opportunities	Threats
Social inclusion	<p>Declining rates of poverty in programme area, albeit at still at higher levels in urbanised regions</p> <p>Specialised institutions and good standard of social and health services</p> <p>Generally good coverage and access to health and social services</p> <p>No significant income differences across regions in programme areas on each side of the border.</p>	<p>Insufficient cross-border knowledge about the social system and organisations and actors in the health and social care system</p> <p>Legal and institutional framework not harmonised</p> <p>Shortages of skilled personnel, further exacerbated by overall labour shortage</p>	<p>Electronic information sharing systems may reduce inefficiencies and personnel requirements</p>	<p>Rural emigration to urban centres putting more strain on service providers in urban centres</p> <p>Increasing regional differences in quality and accessibility of health and social services as a result of differences in personal incomes, public finance and the migration of capacities</p> <p>Higher share of population in urban centres at risk of social exclusion and poverty</p> <p>The influx of large amounts of immigrants starting in 2015 has put social services under strain. Further, population segments may experience a high degree of social alienation</p>
Human capital investments	<p>Highly developed education system and capacities of educational facilities of all levels</p> <p>Centres of academic excellence in programme area</p> <p>Widespread technical education capacities</p> <p>Educational institutions providing life-long learning services</p>	<p>Insufficient integration of labour market needs into tertiary education system</p> <p>Pronounced language barriers in Austrian programme area, with fewer persons speaking Czech, than German on the Czech side</p> <p>Incompatibility of curricula</p> <p>Low representation of women in technical studies</p> <p>Settlement structure as framework for the education infrastructure</p>	<p>Increasing interest of students in exchange programmes</p> <p>Increasing awareness of importance and interest in education – increasing level of education/qualification of human resources in the region</p> <p>Experience of tertiary educational institutions with cooperation, networking, sharing capacities and joint projects</p>	<p>Increasing rates of early school leavers, especially among men</p> <p>Urban/rural split in educational attainment: High rates of tertiary education attainment in urban centres, low attainment in rural areas.</p>

The Austrian-Czech labour force is generally well trained and highly specialised. Labour productivity is also relatively high, however, a gap between the Austrian and Czech parts of the programme regions persist, despite narrowing over recent years. Over recent years, the pro-

programme area reached full employment, with declining rates of structural unemployment noted (Arbeitsmarktservice Österreich 2018, CZSO 2018).

Labour market flows across the border are generally found to be one-sided, with relatively more individual crossing the border into Austria to work, than vice versa. Language and cultural differences may increase individual barriers to seek cross-border employment. Within the programme area, shortages of highly skilled workers are found in rural areas, with a conversely higher supply in urban areas. Internal migration pushes well-educated people away from rural areas, into urban centres, often denoted with slightly higher unemployment rates (e.g. Vienna).

Urban centres feature higher shares of the population at risk of social exclusion than rural regions. This trend has been exacerbated with the arrivals of migrants post 2015, as cities absorb relatively more of the arrivals. Across the programme area, increasing number of men leave school early. This trend has fastened in pace since the economic crises of the late 2000s. However, the education sector produces positive results, with several centres of excellence across the programme area.

5.1.4 Main Challenge and Needs

Strengths

The economic situation of the programme area is relatively healthy. The programme area boasts a low unemployment rates, especially in the Czech regions. Unemployment rates in 2018 vary between 1.2% and 2.3% in the Czech regions (CZSO 2018) and, with the exception of Vienna, generally below 6% in the Austrian regions. The relatively higher unemployment rate in Austria is counterbalanced by year-on-year rapid reduction in persons seeking unemployment (Arbeitsmarktservice Österreich 2018). The strong upswing in employment also carries stronger consumer spending and declining rates of poverty and population share at risk throughout the programme area.

Regions also feature a well-equipped education system and a relatively high stock of human capital, which makes the region attractive to investment and the formation of SMEs. Especially in urbanised regions is the formation rate of SMEs high. Similarly, urbanised regions attract the bulk of R&D spending and employment, and thus, also produce the majority of outputs. Patent registration remain high, especially in the urbanised Austrian regions (Eurostat 2018). SMEs generally have good access to financing throughout the programme area and remain competitive. The importance of SMEs as the backbone of economic life contributes to the resilience of the programme area against adverse macroeconomic shocks, by hedging economic risk.

The programme area features a well-developed system of public transportation, especially in regards to rail links connecting urban centres with sub-urban and rural regions. A significant portion of the consumed electricity is generated via sustainable sources, especially in the

Austrian regions (Eurostat 2018). Additionally, emergency services are well experienced in rescue operations stemming from natural disasters, especially flooding.

Weaknesses

Employment and participation rates for women remain relatively lower throughout the programme area than for men. This is also marked by a stagnant labour market participation rate, especially in Czech regions (CZSO 2018). Disposable income rising slowly and stagnating in some regions (Statistik Austria 2018, Eurostat 2018). This is further exacerbated by a rift in the programme area, namely significantly lower incomes in Czech regions than in Austrian. The overall high rate of employment also comes with downsides, namely a pronounced labour shortage of qualified personnel, which may hamper productivity. In terms of cross-border labour exchange, labour tends to flow from the Czech into the Austrian programme area, not generally vice-versa.

In terms of R&D spending, disparities between parts of the programme area are pronounced. Urban centres attract relatively more spending than rural regions, conversely the Czech regions lag behind in terms of expenditure (Eurostat 2018). Broadband coverage has increased significantly since the beginning of the programming of the OP, however, clear disparities are also noted in this area. Whereas near universal broadband coverage has been achieved in the Czech regions of the programme area, Austrian regions are still lagging behind the European average. The labour shortage observed across the region may affect both the R&D performance and the competitiveness of individual SMEs. The programme area consumes more electricity per capita than the European average. Furthermore, the reliance on renewable fuels emitting greenhouse gasses (such as wood), may negatively affect the environment.

Opportunities

Digital technologies are increasingly promoted and embraced by authorities in the programme area which can lead to efficiency gains. Especially in urban centres, effective start-up support structures exist which can further harness innovative processes. These structures also promote company formation in rural areas, if the framework conditions are met. The increased use of e-mobility solutions, such as electric cars and buses, may reduce traffic-related pollution in the programme area. However, the underlying infrastructure may require additional investment, as the density of charging stations outside of urban centres remains low.

The programme area maintains a generally healthy economic setting with a well-stocked pool of human capital and international locations for companies.

Threats

The programme area is characterised by relatively higher greenhouse gas emissions than the European average (Eurostat 2018), despite an above-average reliance on renewable energy sources. The consequences of climate change also pose a risk: weather extremes are increasing in frequency, especially in summer and winter seasons. Rural emigration to urban centres is putting both the existing infrastructure under relatively more strain, as well as con-

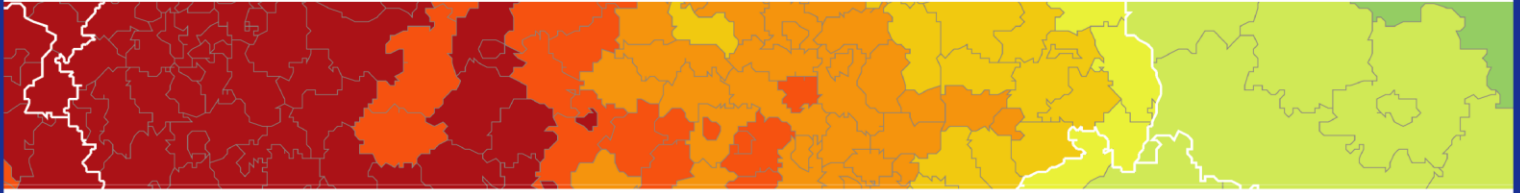
tributing to rural labour shortages, especially of workers with tertiary education. Urban centres conversely experience a relatively higher supply of persons with tertiary education. The immigration push towards urban centres poses additional challenges in regards to supplying accessible housing, employment, as well as increasing the strain on infrastructure networks.

This disparity is increased with the refugee inflows of 2015 and after, which are centred on urban regions. This puts a higher strain on social services, as well as increasing the demand for housing. The population groups emigrated to the programme area are also at risk of social alienation, due to cultural differences and poverty.

Tourists are disproportionally allocated in the programme area, with the majority of tourists visiting the urban centre of Vienna (Eurostat 2018). This unequal distribution of tourists can cause additional damage to natural and cultural heritage, as well as the environment, due to increased traffic and pollution. In addition, in the Austrian portion of the programme area, surface area is increasingly sealed up for housing, infrastructure, commercial and industrial activities. This trend can also be observed in less densely populated areas, as well as areas with declining population figures.

References

- Berichte und Auswertungen (2018), Arbeitsmarktservice Österreich, retrieved from:
<https://www.ams.at/arbeitsmarktdaten-und-medien/arbeitsmarkt-daten-und-arbeitsmarkt-forschung/berichte-und-auswertungen#oberoesterreich>
- Cooperation Programme AT-CZ 2014 – 2020 (2015). (Interreg V-A) AT-CZ – Austria-Czech Republic. Version: final
- Durchführungsbericht für das Ziel „Europäische Territoriale Zusammenarbeit“ (2017). (Interreg V-A) AT-CZ – Austria-Czech Republic. Version: 2016.0
- Durchführungsbericht für das Ziel „Europäische Territoriale Zusammenarbeit“ (2017). (Interreg V-A) AT-CZ – Austria-Czech Republic. Version: 2016.1
- Eurostat Database(2018), Eurostat, European Commission. Retrieved from:
<https://ec.europa.eu/eurostat/de/data/database>
- Jährliche Personeneinkommen (2017), Statistik Austria. Retrieved from:
https://www.statistik.at/web_de/statistiken/menschen_und_gesellschaft/soziales/personeneinkommen/jaehrliche_personen_einkommen/index.html
- Regional Statistics (2018), Czech Statistical Office, retrieved from:
https://www.czso.cz/csu/czso/regions_towns_
- Small and Medium-Sized Enterprises in European Regions and Cities (2017), ÖIR, KMU Forschung, VVA, Oxford Group, EUROREG
- ÖROK-Empfehlung Nr. 56: „Flächensparen, Flächenmanagement & aktive Bodenpolitik“ (2017), ÖROK



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

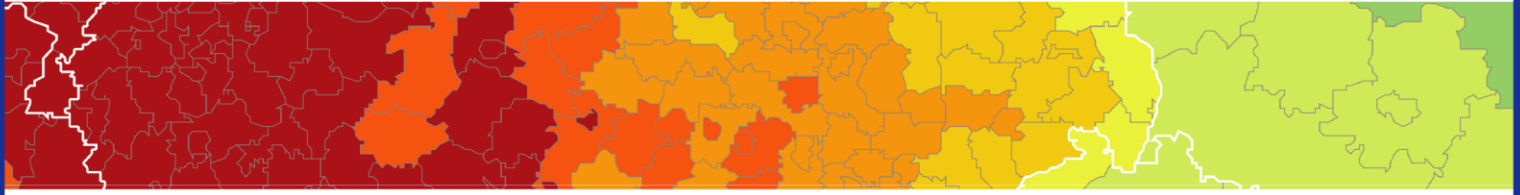
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG A Central Baltic

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG A Central Baltic

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview needs and challenges	2
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	3
3 Indicators	7
3.1 Initial result and output indicators used in assessment	7
3.2 Proposed Key Territorial Indicators.....	11
4 Benchmarking.....	15
4.1 Gross Value Added in Knowledge-Intensive Sectors	15
4.2 Human Capital in the Programme Area	18
4.3 Tourism and Sustainability.....	21
4.4 Regional Scoreboards.....	24
5 Reference Analysis	26
5.1 Territorial specificity of the programme area.....	26
5.1.1 Smart Growth	26
5.1.2 Sustainable Growth.....	27
5.1.3 Inclusive Growth	27
5.1.4 Main Challenge and Needs.....	28
References	31

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	7
Figure 4.1: Regional Scoreboard.....	24

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	14
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	14
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	17
Map 4.2: Synthetic indicator: Number of patents + employment in medium knowledge intensive sectors + employment in highly knowledge intensive sectors	20
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	23

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.	11
Table 5.1: SWOT Analysis Smart Growth	26
Table 5.2: SWOT Analysis Sustainable Growth.....	27
Table 5.3: SWOT Analysis Inclusive Growth.....	27
Table 5.4: SWOT Analysis Overall Challenges and Needs	28

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

Countries involved:

- *FI Finland/SUOMI*: Etelä-Karjala, Pirkanmaa, Satakunta, Päijät-Häme, Kanta-Häme, Kymenlaakso, Helsinki-Uusimaa, Varsinais-Suomi, Ahvenanmaa
- *EE Estonia/EESTI*: Põhja-Eesti, Lääne-Eesti, Kesk-Eesti, Kirde-Eesti, Lõuna-Eesti
- *LV Latvia/LATVIJA*: Kurzeme, Pierīga, Rīga, Vidzeme, Zemgale
- *SE Sweden/SVERIGE*: Gävleborg, Uppsala, Stockholm, Västmanland, Örebro, Södermanland, Östergötland, Gotland

Population in programme area: 10.5 million inhabitants (2% of total EU population)

Total Budget: EU support: € 122,360,390 (ERDF), national counterpart: € 37,916,232

2.2 Contribution to EU 2020 strategy & situation in the programme area

“The Programme supports projects in four priorities: Competitive economy, Sustainable use of common resources, Well-connected region and Skilled and socially inclusive region.”

Smart Growth: The programme focuses on strengthening the competitiveness of SMEs, promoting entrepreneurship and improving flows of goods and people.

Sustainable Growth: The support of sustainable tourism, reduction of pollution in the Baltic Sea and improvement of urban environments are goals of the programme.

Inclusive Growth: The programme focuses on vocational education and training schemes and to strengthen disadvantaged communities through small scale projects.

2.3 Overview needs and challenges

The Programme area includes coastal regions of Sweden, Finland, Estonia and Latvia, for whom the Baltic Sea plays an important economic and cultural role. It covers the capital cities of all four countries, but also peripheral and isolated islands and rural regions. Urban-rural disparities are identified as a joint challenge. The Programme aims to promote economic, social and territorial cohesion by supporting business creation, developing natural and cultural resources, improving small ports and strengthening local communities.

- **Population**: All regions are facing population ageing, and many also experience population decline, even though the population particularly in the capital areas has been growing strongly. To counteract processes of urbanisation, new employment opportunities have to be created in the rural areas. Population ageing creates pressures to increase productivity and exploit opportunities of the “silver economy”. Further integration of labour markets and work-related migration are potential solutions for regional mismatches of jobs and skills.
- **Education and research**: The region boasts a high proportion of people with tertiary education and host top-level universities. Internationalisation and cross-border cooperation could strengthen entrepreneurial activities and the competitiveness of the area.

- Labour market: The regions in the programme area have varying employment levels. Unemployment declined after the economic crisis, but challenges still exist to reduce the mismatch of skills and demands on the labour market and to lower youth unemployment.
- Economic development: Levels of economic development differ across the programme area. There are strong potentials to further develop already existing trade links between the Central Baltic countries. The export capacity of companies needs to be strengthened, and the “blue”, “green” and “silver” business areas further developed. Sectors with high potential in the area include ICT products and forestry, food production, logistics and chemical industry. The region is also a tourist destination, but this sector is challenged by seasonality.
- Gender equality: The number of women in employment and education is increasing. Gender gaps in salaries and employment are smaller than in many other EU countries. Nonetheless, gaps remain, with few women in decision-making positions, the private sector and research.
- Environment: The Baltic Sea suffers from eutrophication. It also warms up fast under current climate change conditions. Efficient marine space management across borders is needed to ensure that economic activities are carried out in a sustainable way.
- Natural/cultural heritage: The programme area boasts natural and cultural heritage sites, which are an asset for sustainable tourism and quality of living for residential populations.
- Transport: The programme area has a well-developed transport network (road, railway, sea, inland waterways and air routes), but rural and peripheral areas face poorer accessibility. All transport modes still depend on fossil fuel to a large extent, creating the need to further develop low-carbon, sustainable transport systems. Small ports are of particular relevance for the population in the programme area and important sources for tourism development.
- Communication infrastructure: The programme area has a comparatively well-developed ICT infrastructure and hosts globally competitive companies in the ICT sector, creating excellent business opportunities to develop tools and services for an ageing population.
- Social inclusion: Levels of social inclusion differ, resulting from differences in long-term unemployment, household incomes and youth unemployment. Better integrated labour markets could create new work opportunities and decrease social exclusion.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1.1: New Central Baltic knowledge intensive companies

Priority Axis 1: Competitive Economy (TO3, IP 1 of PA 1)

- *Brief justification:* The specific objective aims to target challenges related to the sustainability of the businesses operating in remote, rural and sparsely populated communities and those that are characterised by seasonality of traditional activities.
- *Main change sought:* Exploitation of the opportunities of the “green”, “silver” and “blue” economy. New business creation on the basis of ICT and low-carbon solutions. Creation of new joint Central Baltic enterprises and co-operation between new enterprises.
- *Expected activities:* Awareness raising, training, coaching, advisory services, networking, incubator services etc.
- *Beneficiaries:* Potential entrepreneurs and newly established enterprises contributing to the “green”, “low-carbon”, “blue” and “silver” economies, technology start-ups

Specific objective 1.2: More entrepreneurial youth

Priority Axis 1: Competitive Economy (TO3, IP 1 of PA 1)

- *Brief justification:* Use the potential of the young generation to make the Central Baltic region more entrepreneurial and competitive.
- *Main change sought:* Create more student companies (teams formed for business simulation under adult supervision)
- *Expected activities:* Awareness raising, training, internships, advisory services, networks, capacity building of teams and student firms, design of e-platforms and e-tools
- *Beneficiaries:* Students involved in basic and upper secondary education, business development organisations, youth organisations, education institutions

Specific objective 1.3: More exports by the Central Baltic companies to new markets

Priority Axis 1: Competitive Economy (TO3, IP 2 of PA 1)

- *Brief justification:* Use the potential of the young generation to make the Central Baltic region more entrepreneurial and competitive.
- *Main change sought:* Support Central Baltic SMEs to enter into new markets (outside EU/EFTA) with a focus on innovation, product development and internationalization.
- *Expected activities:* Development and adaptation of services and products in new markets, process development, branding, marketing, human resource development, market analysis, feasibility studies
- *Beneficiaries:* SMEs in business clusters, organisations and authorities responsible for cluster development and business development, business associations, regional development organisations

Specific objective 2.1: Natural/cultural resources developed into sustainable tourist attractions

Priority Axis 2: Sustainable use of common resources (TO6, IP 1 of PA 2)

- *Brief justification:* A balance should be found between preserving and developing natural and cultural resources.
- *Main change sought:* Improve attractiveness of living and visiting environments by developing cultural and natural resources into joint tourist attractions and products
- *Expected activities:* Identifying the potential use of natural and cultural resources, designing attractions, packaging tourist services, investments, marketing activities
- *Beneficiaries:* Visitors and local people, companies in the tourism sector, local and regional organisations for tourist development and the maintenance and development of natural and cultural heritage, local and regional authorities

Specific objective 2.2: Sustainably planned and managed marine and coastal areas

Priority Axis 2: Sustainable use of common resources (TO6, IP 1 of PA 2)

- *Brief justification:* Address joint challenges related to maritime spatial planning of exclusive economic zones of territorial waters and integrated coastal zone management.
- *Main change sought:* A more sustainable use of the fragile resources of the Baltic Sea and its coastal areas. Foster cooperation, mediate and find the balance between different sectors that have different interests using marine and coastal resources.
- *Expected activities:* Information collection, participatory processes, exchange events, seminars, manuals, guidelines, e-platforms for supporting participatory processes
- *Beneficiaries:* local people, visitors and companies interested in developing sea and coastal resources, organisations and authorities responsible for the planning of territorial waters and for specific sectors using marine and coastal resources

Specific objective 2.3: Better urban planning in the Central Baltic region

Priority Axis 2: Sustainable use of common resources (TO6, IP 2 of PA 2)

- *Brief justification:* The SO aims to target the challenges and opportunities related to improving the urban space.
- *Main change sought:* Improvement of urban planning.
- *Expected activities:* Information collection, surveys, seminars, trainings, preparatory activities of environment impact assessments, primary designs for brownfield regeneration, pilot investments, dissemination of good practice
- *Beneficiaries:* Inhabitants, visitors, developers of urban/sub-urban areas, organisations and authorities on local, regional and national level responsible for spatial planning

Specific objective 2.4: Reduced nutrients, hazardous substances and toxins inflows into the Baltic Sea

Priority Axis 2: Sustainable use of common resources (TO6, IP 3 of PA 2)

- *Brief justification:* The water quality of the Baltic Sea region should be improved.
- *Main change sought:* Reduce nutrients, hazardous substances and toxins inflows into the Baltic Sea from all types of land-based sources
- *Expected activities:* Information collection, surveys, development and implementation of methods and technologies to reduce nutrients, hazardous substances and toxins inflows, pilot investments
- *Beneficiaries:* People living in the Central Baltic region, visitors, organisations and authorities for environment protection and water treatment, research institutions

Specific objective 3.1: Improved transport flows of people and goods

Priority Axis 3: Well-connected region (TO7, IP 1 of PA 3)

- *Brief justification:* Different transport nodes are not optimally integrated; transport corridors in North-South and East-West directions should be improved.
- *Main change sought:* Reduce time in transportation for passengers and cargo and reduce CO₂ emissions. Improve existing transport corridors and create new transport corridors which have a significant potential.
- *Expected activities:* Plans for improving transport corridors and nodes, pilot investments, planning and investments into ICT solutions, marketing activities, joint seminars, visits, surveys, trainings for the implementation of new methods
- *Beneficiaries:* People and visitors, transport and logistics companies of the area, organisations and authorities on national, regional and local level responsible for planning and developing transport solutions, port authorities

Specific objective 3.2: Improved services of existing small ports to improve local and regional mobility and contribute to tourism development

Priority Axis 3: Well-connected region (TO7, IP 1 of PA 3)

- *Brief justification:* The mobility and transport opportunities in the Central Baltic are not optimal.
- *Main change sought:* Improve the services of small ports' network to boost mobility and improve travel opportunities for local people and visitors. The use of modern technologies leading to resource efficiency and use of renewable energy is supported.
- *Expected activities:* surveys, plans for improving port services, investments, planning and investing into ICT solutions, marketing activities

- *Beneficiaries:* Inhabitants using small ports, visitors, companies offering services to users of small ports, private companies operating/providing services for small ports, organisations and authorities responsible for development/maintenance of small ports

Specific objective 4.1: More people benefiting from stronger Central Baltic communities

Priority Axis 4: Skilled and socially inclusive region (TO10, IP 1 of PA 4)

- *Brief justification:* The region experiences some local level social problems related to health, minorities, safety, gender, elderly, low involvement in entrepreneurship.
- *Main change sought:* Strengthening social inclusion through joint educational and/or training activities through “people to people” projects.
- *Expected activities:* Surveys to identify and map problems, training, seminars, exchange events, network development, designing and creating ICT solutions
- *Beneficiaries:* People under risk of social exclusion, regional and local authorities and non-governmental organisations that deal with community development.

Specific objective 4.2: More aligned vocational education and training (VET) programmes in the Central Baltic region

Priority Axis 4: Skilled and socially inclusive region (TO10, IP 1 of PA 4)

- *Brief justification:* There is a need to enhance the competitiveness of VET programmes and align them more closely with the needs of the labour market.
- *Main change sought:* Development and further integration of the Central Baltic labour market, decrease of social exclusion.
- *Expected activities:* Surveys, develop new curricula and improve existing ones, pilot training/education activities, seminars, develop distance learning/e-learning platforms
- *Beneficiaries:* people in vocational education and training, companies, vocational education and training institutions, authorities responsible for developing vocational education and training, organisations representing employers and employees.

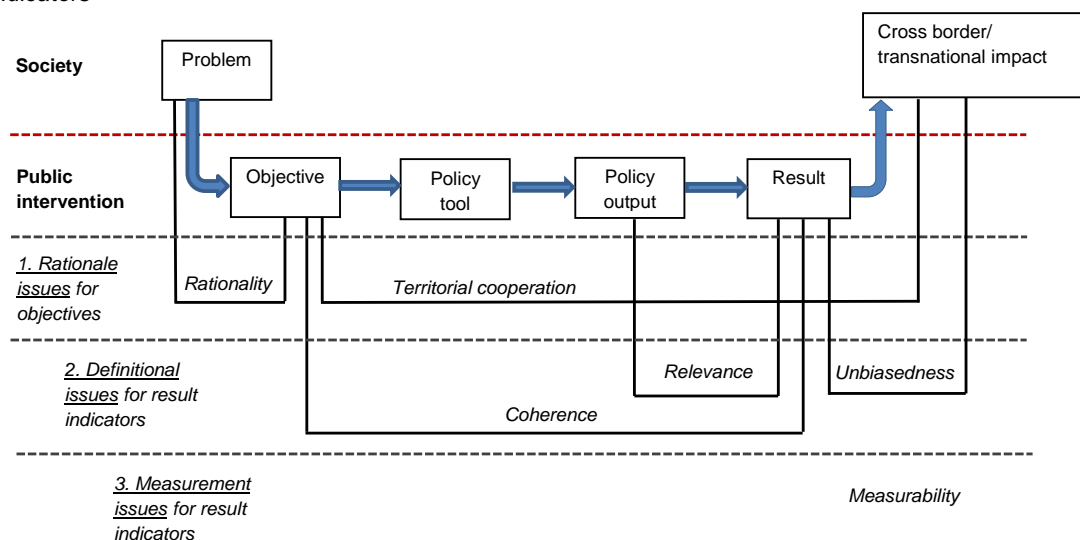
Synergies with other EU interventions: Synergies are expected especially with adjacent ENI programmes (South-East Finland-Russia and Estonia-Russia and Latvia-Russia). There has been some interest to include Russian actors in the Central Baltic Programme 2014-2020.

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
3	New Central Baltic knowledge intensive companies	Number of joint or cooperating knowledge intensive enterprises (number of enterprises)	HIGH	HIGH	MEDIUM - The number of firms does not capture their performance in terms, for instance, of employment and VA	HIGH	LOW - The number of new firms could be influenced by other factors (exogenous economic shocks, level of human capital, etc)	HIGH
3	More entrepreneurial youth	Number of established joint student companies (number of student companies)	HIGH	LOW - It is not fully clear how territorial cooperation will help achieving this result	HIGH	HIGH	HIGH	LOW - Official statistics do not provide these data, therefore comparability with other regions is limited
3	More exports by the Central Baltic companies to new markets	Number of cluster co-operations exporting to new markets (number of cluster co-operations)	HIGH	LOW - It is not fully clear how territorial cooperation will help achieving this result	MEDIUM - The objective is to increase exports, while the result indicator is measuring the co-operations	MEDIUM - The result indicator is measuring an intermediate element between output and result	HIGH	LOW - Official statistics do not provide these data, therefore comparability with other regions is limited
6	Natural and cultural resources developed into sustainable tourist attractions	More sustainable joint natural and cultural heritage based tourist attractions (number of attractions)	HIGH	HIGH	LOW - The number of attractions does not capture neither the sustainable management of cultural/natural resources nor their attractiveness for tourism	MEDIUM - The result indicator is measuring an intermediate element between output and result	HIGH	LOW - How is an "attraction" defined?
6	Sustainably planned and managed marine and coastal areas	Share of marine and coastal areas with improved management (% (share) of marine and coastal areas)	LOW - The objective is quite generally defined, which could be problematic as far as the definition of a result indicator is concerned	HIGH	MEDIUM - Due to the generality of the objective	HIGH	LOW - Environmental quality is influenced by several other factors (exposure to pollutants from other areas, economic activities etc.)	LOW - How is the "improved management" defined?
6	Better urban planning in the Central Baltic region	Share of urban areas covered with integrated urban management (%)	LOW - The objective is quite generally defined, which could be problematic as far as the definition of a result indicator is concerned	LOW - It is not fully clear how territorial cooperation will help achieving this result	MEDIUM - Due to the generality of the objective	HIGH	HIGH	LOW - Official statistics do not provide these data, therefore comparability with other regions is limited
6	Reduced nutrients, hazardous substances and toxins inflows into the Baltic Sea	Amounts of nutrients, hazardous substances and toxins inflows into the Baltic Sea (% consolidated, based on targeted and achieved reductions)	HIGH	LOW - It is not fully clear how territorial cooperation will help achieving this result	HIGH	HIGH	LOW - Sea pollution could be influenced by factors not under the control of policy makers (pollutant emissions from other areas, economic activities, etc.)	LOW - Official statistics do not provide these data, therefore comparability with other regions is limited
7	Improved transport flows of people and goods	Travel time of passengers (% of reduction of travel time)	HIGH	HIGH	MEDIUM - Reduction in travel time does not measure how many people will choose the fastest option	HIGH	HIGH	HIGH
7	Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Share of Central Baltic small ports with good services (%)	HIGH	HIGH	MEDIUM - The definition of the result indicator is not clear, what does "good services" mean?	HIGH	HIGH	LOW - What is meant by "good services"?
10	More people benefiting from stronger Central Baltic communities	Communities with improvements (Number of CB communities with improvements)	HIGH	LOW - It is not fully clear how territorial cooperation will help achieving this result	HIGH	HIGH	HIGH	LOW - How are "communities" and "improvements" defined?
10	More aligned vocational education and training (VET) programmes in the Central Baltic region	Share of aligned vocational education and training (VET) programmes in the Central Baltic region (Number of programmes)	HIGH	LOW - It is not fully clear how territorial cooperation will help achieving this result	HIGH	LOW - The result indicator is capturing an output rather than a result	HIGH	HIGH

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

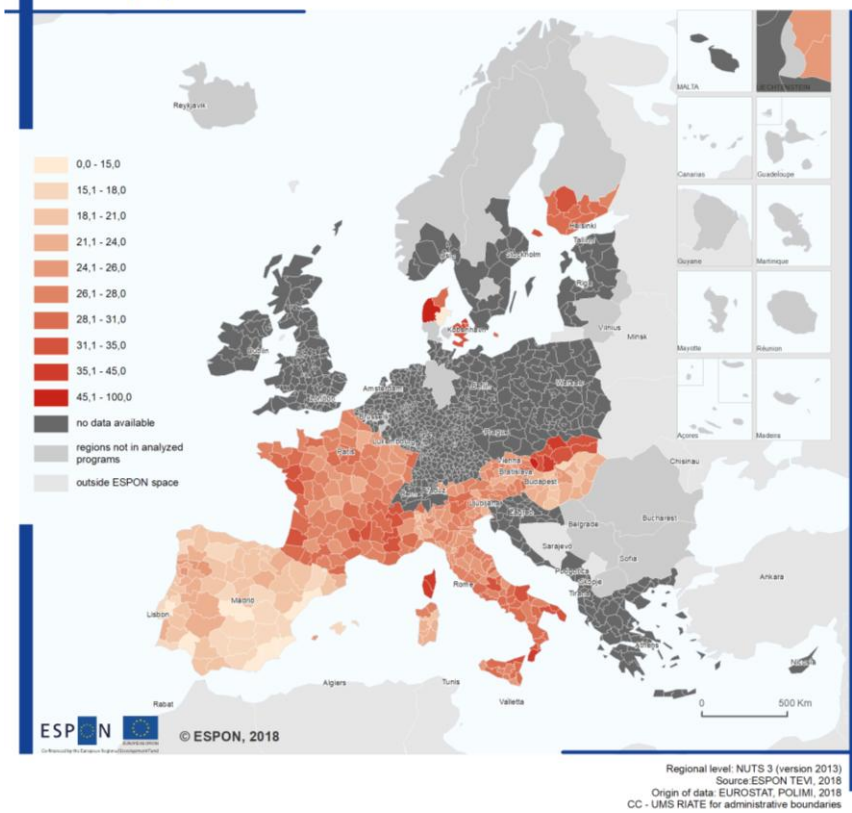
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Programme	ETC objective	Thematic objective	Specific objective	Output indicator	Result indicator	Proposed result indicator
Central Baltic (1)		3	New Central Baltic knowledge intensive companies	O1: Number of participating young people (Number of people) CO1: Number of enterprises receiving support (Enterprises) CO2: Number of new enterprises supported (Enterprises)	Number of joint or cooperating knowledge intensive enterprises (number of enterprises)	Synthetic indicator: number of start-up + people employed in knowledge intensive enterprises + VA of knowledge intensive enterprises + Framework programs
Central Baltic (3)		3	More exports by the Central Baltic companies to new markets	CO1: Number of enterprises receiving support (Enterprises) CO2: Number of enterprises receiving non-financial support (Enterprises) CO3: Number of enterprises supported to introduce new to the market products (Enterprises)	Number of cluster co-operations exporting to new markets (number of cluster co-operations)	Synthetic indicator: increase in export + share of export towards non EU/EFTA markets
Central Baltic (4)		6	Natural and cultural resources developed into sustainable tourist attractions	O1: Number of targeted joint attractions (Number) O2: Number of jointly targeted planning and management activities (Number) CO1: Increase in expected number of visits to supported sites of cultural and natural heritage and attractions (Visits/year)	More sustainable joint natural and cultural heritage based tourist attractions (number of attractions)	Synthetic indicator: tourism presences + seasonality + Natural sites in good conditions
Central Baltic (5)		6	Sustainably planned and managed marine and coastal areas	O1: Number of targeted joint attractions (Number) O2: Number of jointly targeted planning and management activities (Number) CO1: Increase in expected number of visits to supported sites of cultural and natural heritage and attractions (Visits/year)	Share of marine and coastal areas with improved management (% (share) of marine and coastal areas)	Coastal sites in good conditions (Natura 2000)
Central Baltic (9)		7	Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	O1: Number of developed and improved transport corridors and nodes (Number) O2: Number of ports with improved services (Number of ports)	Share of Central Baltic small ports with good services (%)	Synthetic indicator: number of tourists + index of concentration of tourists per port of arrival
Central Baltic (10)		10	More people benefiting from stronger Central Baltic communities	O1: Number of participating people corridors and nodes (Number of people) O2: Number of benefitting vocational education schools (Number)	Communities with improvements (Number of CB communities with improvements)	Index of social inclusion (Synthetic indicator: people under poverty threshold, long-term unemployment rate, etc.)
Central Baltic (11)		10	More aligned vocational education and training (VET) programmes in the Central Baltic region	O1: Number of participating people corridors and nodes (Number of people) O2: Number of benefitting vocational education schools (Number)	Share of aligned vocational education and training (VET) programmes in the Central Baltic region (Number of programmes)	Unemployment rate for low-skilled workers (to be controlled for other influential factors through DID)

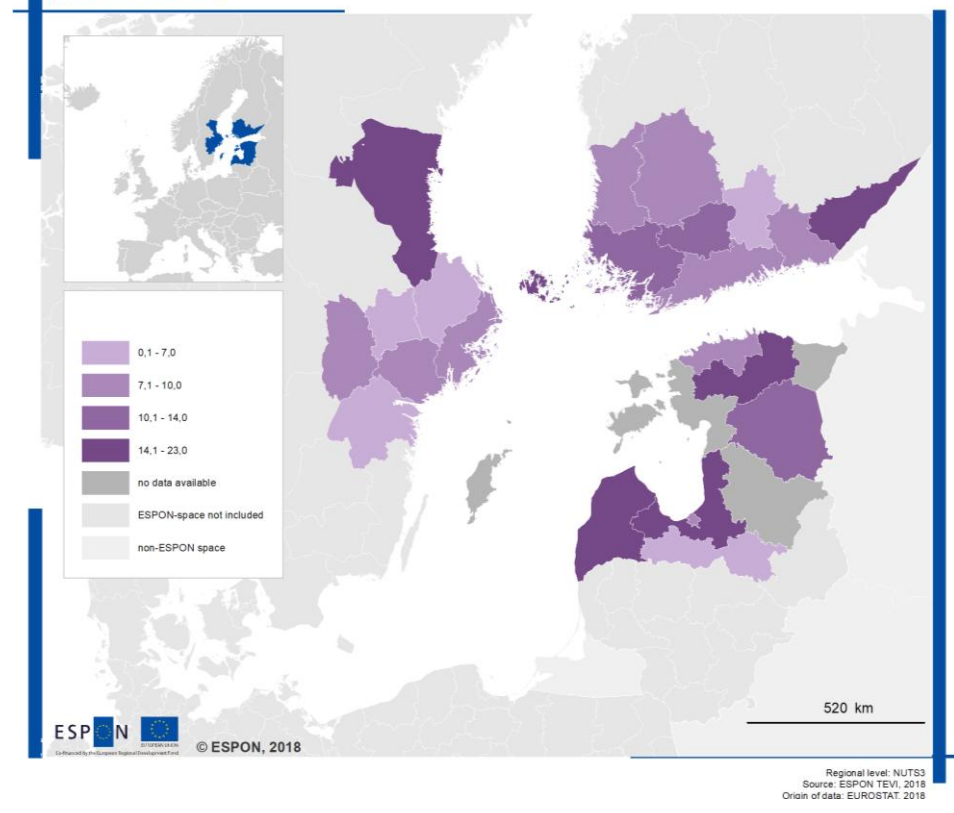
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)

Composite Indicator: patent applications + trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined timeperiod. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 0 can be observed, with corresponding maximum of 104. Minima are found in the more inland areas in the Baltics, as well as surrounding urban agglomerations of Stockholm, Helsinki, and Tampere.

The frontrunner regions displayed in the map are those with highly developed knowledge-intensive clusters, where businesses, universities and public authorities are linked by matured and closely-knit networks and initiatives. The Stockholm area remains a European-level innovation hub in many knowledge-intensive industries backed up by high-quality institutes of higher education. The Helsinki region follows closely, particularly in ICT-linked domains, also

⁶nama_10r_3gva

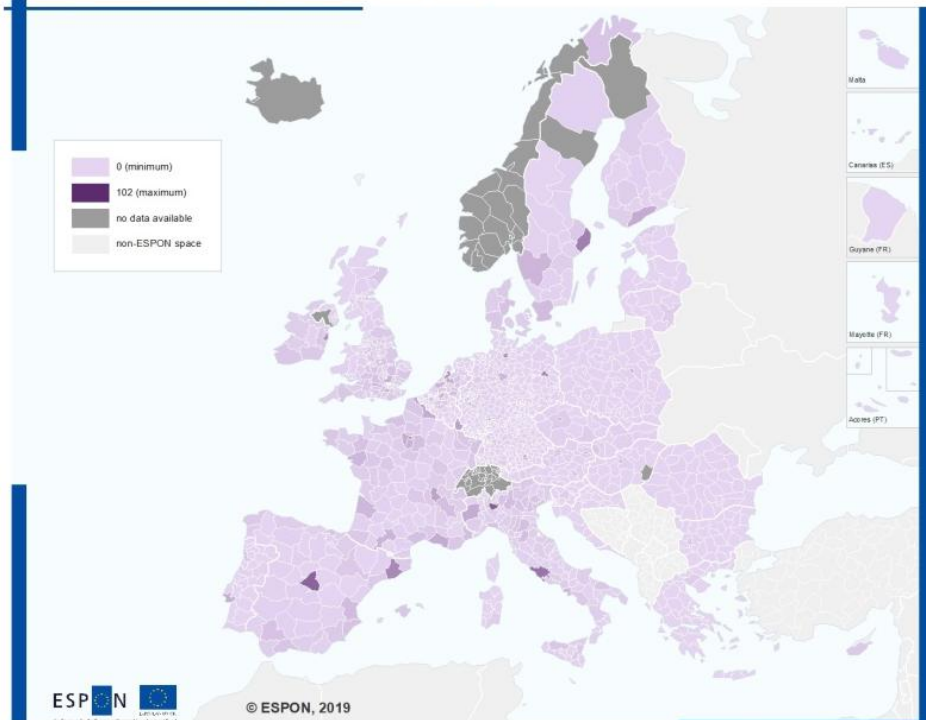
⁷nama_10r_3empers

with a strong and active engagement by universities and technical universities. Tallinn has in the previous years hosted an active and growing start-up scene. The Åland islands, while small in economic and population size, are held in high regard by other Nordic regions for the entrepreneurial spirit and the persistently low unemployment rate prevailing in the island chain. Turku and its surrounding Western Finnish towns, in turn, are seeing a positive trend in recent years, and investments in nearby car manufacturing and shipbuilding facilities are further enabling a network of smaller suppliers in knowledge-intensive fields.

While there is not an absence of industries or education facilities outside these urban regions, it is evident that they are not scoring equally well on the synthetic indicator. One probable cause for this is that the number of start-ups and other engaged entities are not enough to reach a critical mass in the region for a networked innovation system to emerge, which would support the further expansion of knowledge-intensive fields. In such situations, relocating or commuting to the metropolitan centres becomes the best option and economic activities in the neighbouring regions decline. That being said, there are several recent examples where smaller localities have successfully leveraged their local opportunities and human resources to create impressive initiatives and form local business and knowledge networks. Often these projects are supported by European-level funding, and in fact, smaller localities may often have more enthusiasm in seizing these funding and framework project opportunities than big metropolitan centres where venture capital, business networks and other crucial elements are already present and critical mass is formed and maintained.

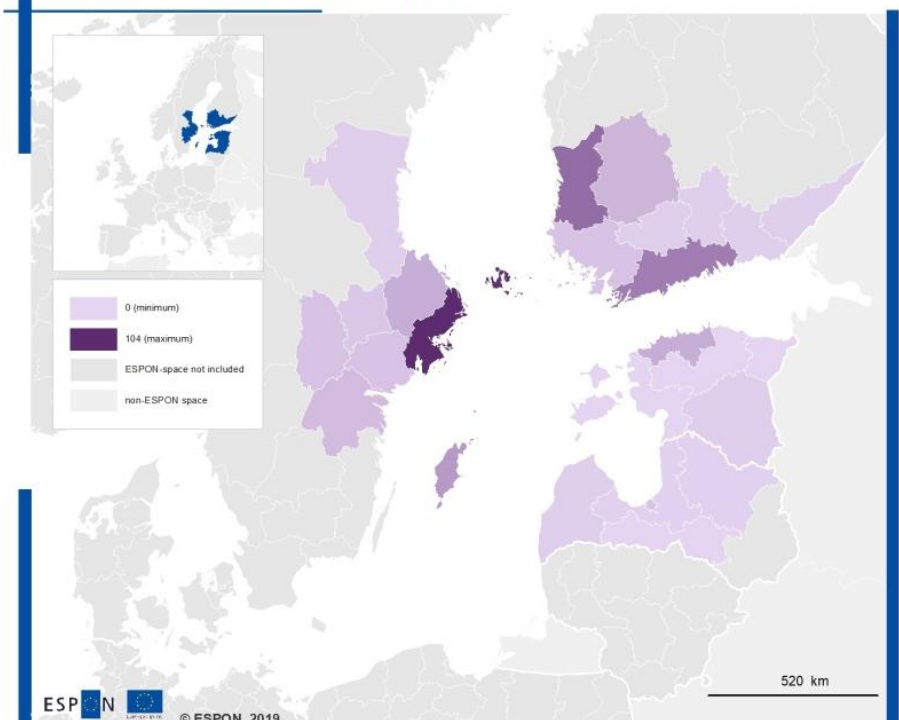
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PolMi, OIR
 © UMS RIATE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PolMi, OIR

4.2 Human Capital in the Programme Area

The maps below present the synthetic composite indicator *Human Capital in Knowledge-Intensive Areas* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Human capital refers to the stock of knowledge and abilities which are applied to produce goods and. The composite indicator reflects the stock of human capital and its distribution across the programme area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities and the necessary inputs. The indicator is calculated in the following manner:

$$HCAP_{i,t} = \frac{1}{3} * Y_{i,t} + \frac{1}{3} * E_{i,t} + \frac{1}{3} * P_{i,t}$$

In which the variable $L_{i,t}$ represents overall normalised employment in medium knowledge intensive industries (e.g. financial and real estate services) in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment specifically in highly knowledge intensive industries (e.g. R&D) in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Data on employment in knowledge intensive sectors was obtained from the NACE dataset.⁹

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 5.8 can be observed, with corresponding maximum of 158. Minima are found in relatively rural areas and inland, predominantly in Lithuania. Maxima are found along urban centres, for example NUTS-3 regions around Stockholm.

Much like the map on the previous synthetic indicator, the human capital measure is displaying particularly strong R&D-focus in those areas with mature innovation systems and strong universities. In Stockholm both established industries and start-ups are constantly expanding and engaging with the local skills-base. These innovative clusters are supported by Stock-

⁸ tgs00041

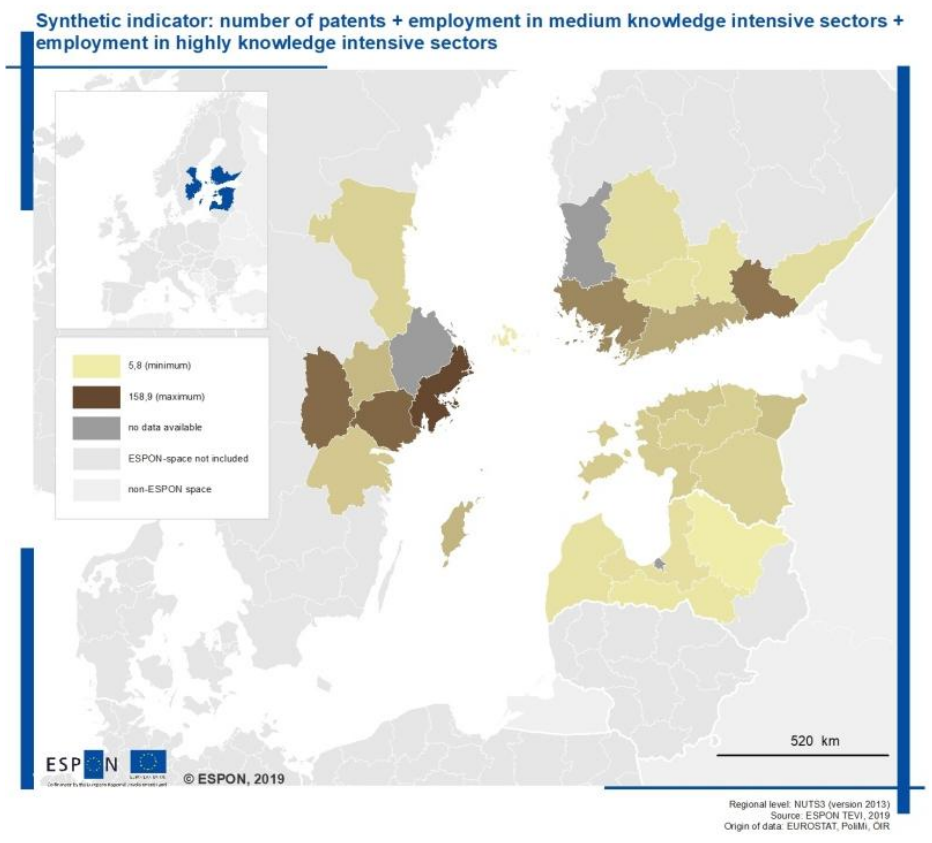
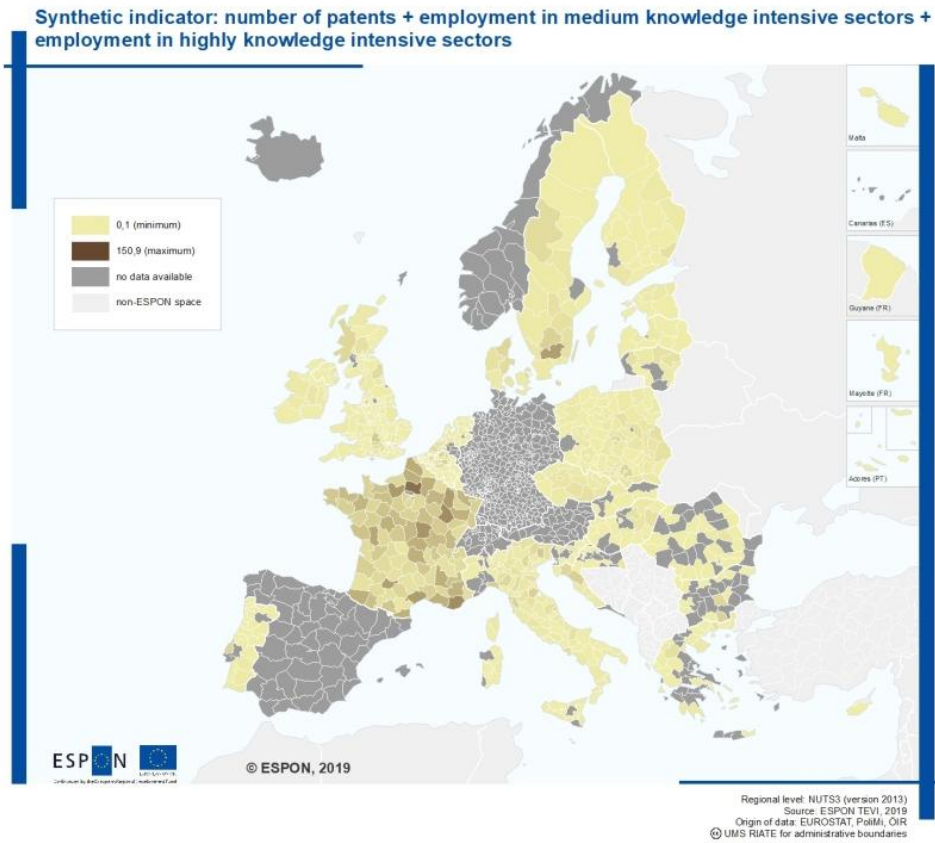
⁹ nama_10r_3empers K_M & M_N

holm's strong university base, with Karolinska, KTH and the Stockholm School of Economics collaborating on research and training in their respective fields. The Southern Finnish coast is likewise displaying engagement by industry-sectors by well-trained human capital resources – these Finnish industry centres have strong universities, industry laboratories, text centres and research facilities in an array of sectors.

The map further displays strong R&D focus also in a number of regions inland from Stockholm in Central Sweden. While critical mass formation and size of local innovation systems may not be as substantive as elsewhere, several smaller Swedish towns (e.g. Linköping, Örebro, Karlstad) host research-focused universities and other faculties of higher education that together with local industry have developed a diversity of research institutes and laboratories that attract highly-skilled workers from Sweden and abroad. This widespread R&D engagement in many parts of Sweden is also often linked to EU funding and framework programmes, as local authorities have been committed to retain and attract a skilled workforce and research in knowledge-intensive industries by connecting with European-wide networks and partnerships.

The European-level map is markedly homogeneous, especially in comparison with clear contrasts present in the case of many other synthetic indicators.

Map 4.2: Synthetic indicator: Number of patents + employment in medium knowledge intensive sectors + employment in highly knowledge intensive sectors



4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies the development in tourism and sustainability undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations. The indicator stems from Eurostat and is available in monthly intervals at national level¹⁰. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹¹ is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹². This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 0,2 can be observed with corresponding maximum of 2000. Minima are found in Lithuania and parts of Middle Sweden. Maxima are found predominantly in Finland.

It is remarkable to note that the Tampere region in Central Finland presents the highest score on this synthetic indicator among the regions in the programme area. The Helsinki region with its surrounding coastal areas area as well as Finnish Lapland are conventionally considered

¹⁰ tour_occ_nim

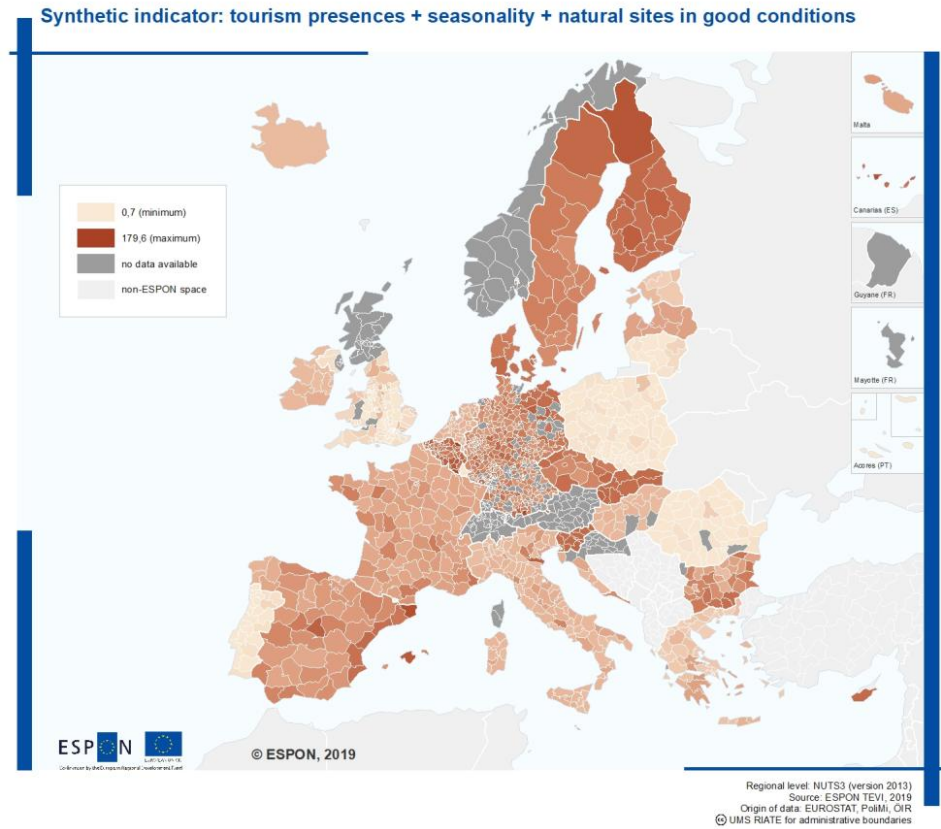
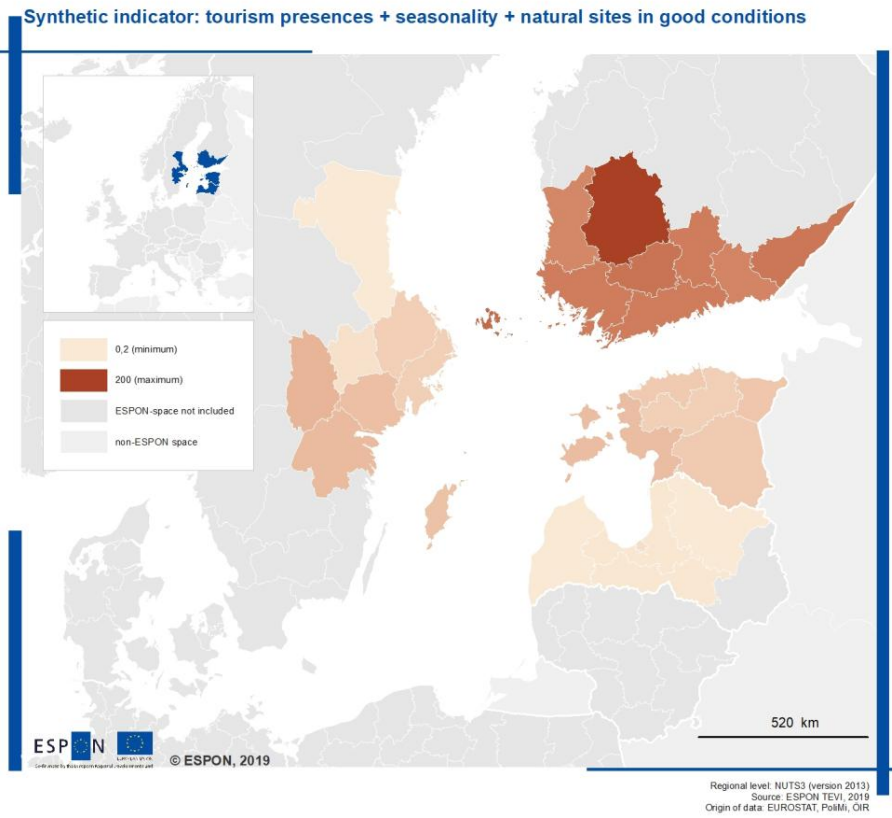
¹¹ Source: EEA, DG REGIO

¹² tour_occ_anor2

the main players in Finnish tourism, but Tampere would now appear to take steps to catch up with the tourism and sustainability appeal of those other regions. Tampere is situated among big lakes and forest areas, and also in general the Finnish regions performing well on this indicator at the European comparative level are characterised by vast natural heritage as well as local communities, businesses and regional authorities that are committed to preserving the natural conditions and prioritise sustainability in business operations and regional planning. The Tampere region is no exception in this and has been engaged in a number of collaborative initiatives and interregional networks that support tourism and sustainability.

While the Nordic (and partly the Baltic) countries score relatively highly in the European-level comparison, there are nonetheless some differences between the regions in the programme area. All Finnish regions score the highest, followed by Estonian regions and Swedish inland regions. Both of the latter are home to well-preserved natural heritage areas, for example the sizable lakes found in the Swedish inland.

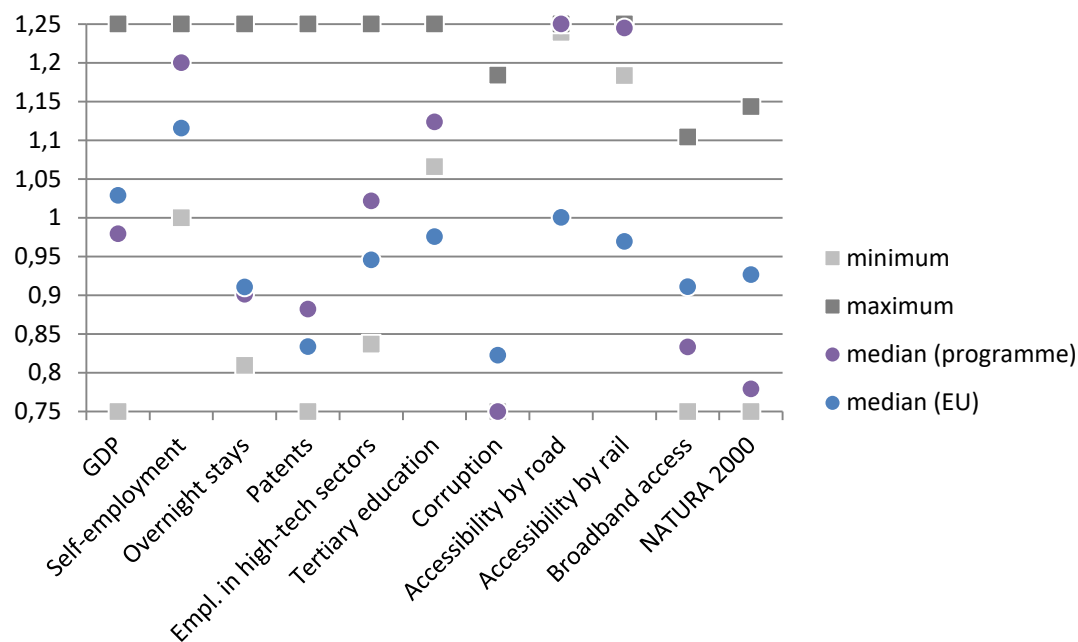
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions



4.4 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The Central Baltic Programme Area performs relatively well in accessibility by rail, self-employment, and employment in high technology industries. Some degree of variance is observed in terms of range of values across the programme regions across some presented indicators, indicating a certain degree of heterogeneity across the programme area. In some cases, the Programme Area is performing worse than EU average, namely in broadband access and share of NATURA 2000 sites.

The programme area scores remarkably highly on accessibility by both road and rail – the towns of central Sweden, Southern Finland and the Northern Baltics are linked together by well-developed infrastructure links. Coastal towns are also connected by popular ferry links across the Baltic sea – so much so that the port of Helsinki has become the world’s busiest passenger port – and the ferry companies have taken steps to develop the sustainability of their ships and operations.

Another score to grant particular mention is the indicator on tertiary education, on which the programme area scores very highly above the EU median value. This is not necessarily surprising: as already noted above, the programme area comprises a number of cities and towns with high-quality institutions of tertiary education. In Sweden Stockholm hosts three leading universities, and there are a number of quality universities in smaller towns. In Finland, the country’s leading education centres are in Helsinki, Turku and Tampere, with several high-quality universities both in terms of teaching and research, and this is supported by Finland’s already strong record on education levels at the primary and secondary level. Estonia and Latvia also host quality tertiary education, especially in their capital cities; recently Estonia has gained recognition for its strong focus on adapting the education system to fit and support people in the digital age.

One indicator where the programme area scores a surprisingly modest measure in comparison with the EU median is the broadband access – for example given the ICT-clusters present in different parts of the programme areas. It is nonetheless important to point out that especially Tallinn as well as the Finnish and Swedish regions have high-quality network infrastructure.

On the remaining indicators, the programme score is more or less similar than and slightly above the EU median values. For some indicators such as self-employment the spread of values is quite homogeneous, while for e.g. the scores on GDP and patents the range of scores is very wide between different parts of the programme area. This is quite well in line with the above-described character of the programme area as one with many leading clusters of knowledge-intensive innovation – societal and employment structures are roughly the same across the regions in the programme area, but the prevailing sectors and pace of technological and economic change may differ.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: Promoting entrepreneurship	Strong, innovative and competitive business environment	Regional differences in economic development and activity	Silver, blue and green economy offer excellent business opportunities	Population ageing could lead to declining local demand and entrepreneurial activities
Criterion 2: Supporting SMEs	Strong ties between CB regions, high economic growth rates	Differences in economic development in the CB region remain: Many rural regions are struggling, metropolitan areas are dominating.	Good conditions for regional cluster development and links between R&D and business.	Ageing and decreasing labour force, risk of brain drain in some regions
Criterion 3: Promoting innovative technologies for environmental protection and resource efficiency	CB sectors with high potential include ICT products and services, electric equipment and forestry	CB cities are stronger innovation drivers than outermost regions, Insufficient use of innovation potential in some regions	Create synergies and transfer innovation between metropolitan and remote/rural areas, combine Baltic entrepreneurial skills with Scandinavian engineering, marketing and financial strength	Regional mismatches of available jobs and skills, decreasing potential for innovation due to population ageing

The Central Baltic programme supports the Europe 2020 objective of “smart growth” especially through its priorities on promoting entrepreneurship and enhancing the competitiveness of SMEs. The goal to promote innovative technologies for environmental protection and resource efficiency can also be considered to contribute to smart growth. The Central Baltic area can build on a strong and innovative business environment. It is also one of the most connected areas in the world, which facilitates cooperation and knowledge exchange across borders. Nonetheless, innovation potential and economic development is concentrated in the metropolitan areas while many rural and remote regions lag behind. Synergies and knowledge transfers between different types of regions could help to close these gaps. The blue, green and silver economies offer business opportunities that also more remote areas could profit from. Population ageing and regional mismatches of jobs and skills provide challenges that should be addressed.

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: Conserving and promoting natural and cultural heritage	The CB region includes many recognised natural and cultural heritage sites, distinctive wildlife, rich scenery etc.	The Baltic Sea is challenged by eutrophication. Climate change poses challenges for many natural sites.	(Sustainable) tourism is an important and growing sector for all CB regions and offers potentials for cross-border cooperation.	Competition for marine space which requires integrated planning and management. However, the implementation of joint actions is challenging.
Criterion 2: Development of environmentally-friendly transport systems	The transport network is well developed and links the CB regions to each other and the rest of Europe.	Accessibility to transport is a challenge for remote and rural areas. Dependency on fossil fuels is high.	Green and blue growth offers potentials for business development.	Increases in shipping transport need to be monitored to ensure that they do not counteract environmental goals (especially with regard to pollution levels in the Baltic Sea). Low demand may make it difficult to sustain transport options to isolated areas.

In relation to sustainable growth, the Central Baltic programme focuses on conserving and promoting natural and cultural heritage and the development of environmentally-friendly and low-carbon transport systems. The programme area has many renowned heritage sites and is already well-connected by multimodal transport networks. Weaknesses include in particular the environmental state of the Baltic Sea, which suffers from ongoing eutrophication and the effects of climate change. With regard to transport, the reliance on fossil fuels remains high and the connectedness of more isolated areas is an ongoing challenge. Sustainable tourism and the green and blue economy offer high potentials for business development and cooperation, but implementing joint actions and plans is difficult. Population decline in rural areas may make it difficult to sustain transport networks, while increasing traffic in urban areas, particularly in ports, may endanger the fulfilment of environmental goals.

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: Investing in joint education and training schemes	Share of people with tertiary education is high and CB region has top-level universities	Involvement rates of adults in education differ across the CB region, youth unemployment is high in some regions	Long migration histories provide preconditions for further integration of CB education and labour markets	Regional differences in availability of high quality education institutions

In the area of inclusive growth, the Central Baltic programme particularly invests in joint education, vocational training and training schemes. The region boasts a high share of people with tertiary education and hosts top-level universities and other educational institutions. Weaknesses include low rates of educational enrolment of the adult population in some regions, slowing down efforts to promote lifelong learning. Parts of the programme area also have relatively high youth unemployment rates. The strong interconnectedness of the region provides ample opportunities to strengthen joint educational programmes and links between labour markets. There is a threat, however, that not all regions will equally profit from such a closer cooperation, since high quality educational institutions are clustered in certain areas.

5.1.4 Main Challenge and Needs

Table 5.4: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	Strong, innovative and competitive business environment with high growth rates and strong ties between regions.	Regional differences in economic activity, entrepreneurship and innovation potential	Blue, green and silver economies offer business opportunities Strong links between the regions and different sectors offer opportunities for synergies and cooperation	Population decline, ageing and regional mismatches between skills and jobs
Sustainable growth	Large range of renowned heritage sites and well-developed transport system	Continuing dependency on fossil fuels in many transport sectors Accessibility challenges for rural regions Environmental status of the Baltic Sea	Green and blue economies and sustainable tourism offer joint business potentials	Decreases in demand may further challenge sustainability of transport networks in rural areas Environmental challenges (especially concerning the Baltic Sea) require coordinated action which are difficult to achieve
Inclusive growth	Share of people with tertiary education is high and CB region has top-level universities	Involvement rates of adults in education differ across the CB region Youth unemployment is high in some regions	Long migration histories provide preconditions for further integration of CB education and labour markets	Regional differences in availability of high quality education institutions

The above table summarizes the main strengths, weaknesses, opportunities and threats in each strategy pillar. The region can draw from a strong economy, a range of outstanding natural resources and a highly educated population. Regional differences in accessibility, economic potential and population density provide challenges. The blue, green and silver economy as well as the development of sustainable tourism may benefit rural areas and help to reduce some of these disparities. This potential may, however, be threatened by population decline, ageing and brain drain from certain areas.

Strengths

The Central Baltic programme area has recovered well from the European debt crisis and is currently experiencing high growth and robust employment. This growth has been sustained by low interest rates, domestic demand and successful cooperation across the Baltic Sea Region. A highly educated population also gives this region an advantage when it comes to innovation, entrepreneurship and the introduction of new technologies. The rich scenery, multifaceted natural and cultural heritage sites offer business opportunities while strong transport connections facilitate cooperation across borders (see Ketels, Pedersen and Olsson 2017).

Weaknesses

Rural, remote and isolated areas in the Central Baltic programme area continue to lag behind metropolitan areas when it comes to economic development, employment rates, entrepreneurship and innovation potential. These regional disparities are partly driven by demographic differences and differences in accessibility and quality of transport (Rispling et al. 2016). Pollution remains high in parts of the Central Baltic area. The Baltic Sea in particular continues to be challenged by eutrophication, caused by high levels of shipping, industry, agriculture and municipal sewage. Car travel continues to account for a large share of all passenger trips in the Baltic Sea region. A shift to more sustainable transport modes is necessary to meet environmental goals on emissions and air quality (Rispling et al. 2016).

Opportunities

The blue, green and silver economies as well as sustainable tourism offer interesting business opportunities for the Central Baltic programme area. Strong links between the regions and across sectors offer potentials for synergies, knowledge sharing and cooperation that also more rural and remote areas could profit from. The programme area also has good conditions for regional cluster development and further development of links between R&D and businesses. Strong links between the Central Baltic countries and long migration histories also offer good opportunities to further integrate education and labour markets for a better alignment of jobs and skills and a reduction of social exclusion. A focus could also be set on increasing participation rates in lifelong learning programmes and developing entrepreneurial attitudes in the population already at young ages (Alamets and Plesanova 2013).

Threats

As in other parts of Europe, the population in the Central Baltic programme area is expected to age during the coming years, and in many rural and remote regions, the population is also expected to decline (Alamets and Plesanova 2013). These demographic trends have a range of implications. For instance, declining population numbers may lead to a shortage of labour force in certain areas and/or sectors and to a reduction in demand for public transport, making it difficult to uphold transport networks in remote areas (Rispling et al. 2016). Population ageing could impact consumption, entrepreneurial activities and innovation capacities. In addition to demographic trends, the introduction of new technologies and changing patterns of globalisation may influence employment, environment and social cohesion in the Central Baltic

programme area. The nature of these developments and their potential impacts are, however, not yet fully understood (see Ketels, Pedersen and Olsson 2017, Böhme et al. 2016).

Climate change may have severe impacts on the Central Baltic environment, but also on the economy. These challenges require coordinated action across borders and regions, but this may be difficult to achieve in practice. Shipping transport on the Baltic Sea is expected to increase further in the future. This needs to be closely monitored to ensure that increased traffic does not counteract environmental goals (especially with regard to pollution levels in the Baltic Sea).

References

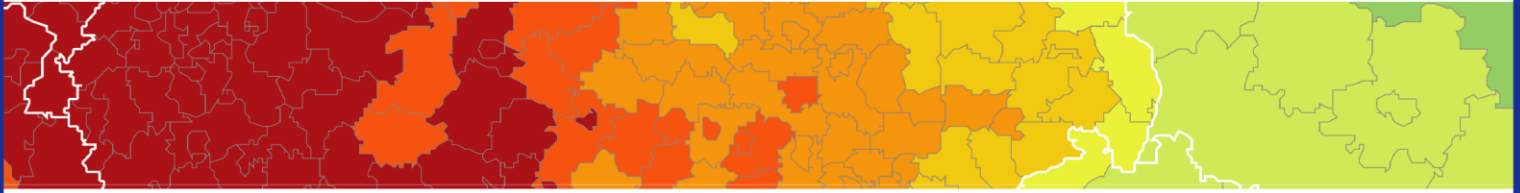
Alamets and Plesanova (2013): Central Baltic Regional Analysis, Central Baltic Programme: Turku.

Böhme, Zillmer, Hans, Antikainen and Pyykkonen (2016): Looking towards 2030: Preparing the Baltic Sea Region for the future, European Strategy for the Baltic Sea Region (EUSBSR), Swedish Agency for Economic and Regional Growth: Stockholm.

Bürger et al. (2011): RES-H-Policy – Policy development for improving RES-H/C penetration in European Member States, IEE project.

Ketels, Pedersen and Olsson (2017): State of the Region Report 2017: The top of Europe – A competitive Baltic Sea Region ready for the Future?, Baltic Development Forum: Copenhagen.

Rispling et al. (2016): Trends, challenges and potentials in the Baltic Sea Region, European Strategy for the Baltic Sea Region (EUSBSR) Swedish Agency for Economic and Regional Growth: Stockholm.



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

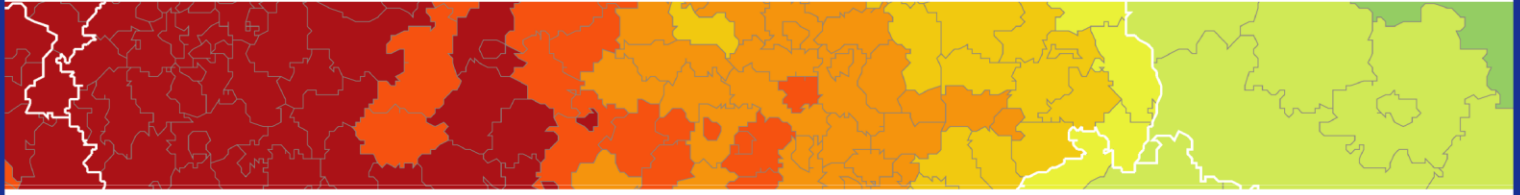
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG B Central Europe

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG B Central Europe

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	3
2.3 Overview needs and challenges	4
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	5
3 Indicators	11
3.1 Initial result and output indicators used in assessment	11
3.2 Proposed Key Territorial Indicators.....	15
4 Benchmarking.....	19
4.1 Gross Value Added in Knowledge-Intensive Sectors	19
4.2 Innovation.....	22
4.3 Tourism and Sustainability.....	25
4.4 Regional Scoreboards.....	28
5 Reference Analysis	29
5.1 Revised SWOT Analyses per Thematic Objective.....	29
5.2 Main Challenge and Needs.....	33
References	35

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	11
Figure 4.1: Regional Scoreboard.....	28

List of Maps

Map 2.1: Location of the area of INTERREG CENTRAL EUROPE	2
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	18
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	18
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	21
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors	24
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	27

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.	15
Table 5.1: SWOT Analysis	29
Table 5.4: SWOT Analysis Overall Challenges and Needs	33

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

Geographical location & territorial characteristics: Covering an area of over 1 million square km the Interreg CENTRAL EUROPE Programme is home to about 146 million people. A detailed territorial analysis of the central Europe area was carried out in 2012, showing that the programme area is highly heterogeneous in geographical terms as well as in economic and social terms. (p. 5) The central Europe area is characterised by a significantly uneven distribution of economic strength, which is rooted in the historical economic development (east-west divide) as

well as in structural differences between regions (urban and industrialised areas vs. rural and peripheral areas). Research and development (R&D) as well as investments are concentrated in few, mostly urban growth poles including capital city agglomerations like War-

Map 2.1: Location of the area of INTERREG CENTRAL EUROPE



Source: INTERREG CENTRAL EUROPE Programme, 2014

saw, Prague, Berlin, Vienna, and Budapest (...). As a consequence, rural and peripheral areas often show a lower competitiveness combined with significant brain-drain. The level of skills and knowledge in these regions suffers accordingly. [Interreg CENTRAL EUROPE Cooperation Programme p. 6]

Countries involved, total budget, Funds: Nine EU Member States cooperate in the Programme, including all regions from Austria, Croatia, the Czech Republic, Hungary, Poland, Slovakia and Slovenia, as well as eight Länder from Germany and nine regions from Italy¹. In total, the programme area is made up of 76 statistical NUTS 2 regions.

¹ AT Austria/ÖSTERREICH (Burgenland, Niederösterreich, Wien, Kärnten, Steiermark, Oberösterreich, Salzburg, Tirol, Vorarlberg); CZ Czech Republic/ČESKÁ REPUBLIKA (Praha, Střední Čechy, Jihozápad, Severozápad, Severovýchod, Jihovýchod, Střední Morava, Moravskoslezsko); DE Germany/DEUTSCHLAND (Freiburg, Stuttgart, Karlsruhe, Tübingen, Oberbayern, Niederbayern, Oberpfalz,

The budget for the Programme is allocated through the European Regional Development Fund. EU budget is € 231,786,426.00 (including technical assistance: € 246,581,112.00); total budget is: € 279,260,535.00 (including technical assistance: € 298,987,026.00). [keep.eu]

2.2 Contribution to EU 2020 strategy & situation in the programme area

With the objective of supporting economic, social and territorial cohesion, the overall goal of the Interreg CENTRAL EUROPE Programme is defined as “Cooperating beyond borders in central Europe to make our cities and regions better places to live and work.” The overall programme goal is further detailed in the following technical description: “Transnational cooperation in central Europe is the catalyst for implementing smart solutions answering to regional challenges in the fields of innovation, low-carbon economy, environment, culture and transport. It builds regional capacities following an integrated bottom-up approach involving and coordinating relevant actors from all governance levels.”

Strengthening capacities is related to creating an enabling environment through improved:

- policy frameworks as well as legal and economic frameworks
- institutional and human resources development
- managerial systems

The specific characteristics of the transnational cooperation programme (CP) Interreg CENTRAL EUROPE is taking into account common challenges and needs shared by most or all regions involved in the programme area and can thus contribute better to social, economic and territorial cohesion than national endeavours alone. The programme strategy seeks to reduce barriers of development by promoting sustainable and integrated territorial approaches. It aims to strengthen existing or to make use of yet untapped potentials to support territorial integration, which will ultimately result in smart, sustainable and inclusive growth directly contributing to the Europe 2020 goals:

- *TO 1:* Strengthening research, technological development and innovation
- *TO 4:* Supporting the shift towards a low-carbon economy in all sectors
- *TO 6:* Preserving and protecting the environment and promoting resource efficiency
- *TO 7:* Promoting sustainable transport and removing bottlenecks in key network infrastructures

[Interreg CENTRAL EUROPE Cooperation Programme p.12]

Oberfranken, Mittelfranken, Unterfranken, Schwaben, Berlin, Brandenburg, Mecklenburg-Vorpommern, Dresden, Chemnitz, Leipzig, Sachsen-Anhalt, Thüringen); HR Croatia/HRVATSKA (Jadranska Hrvatska, Kontinentalna Hrvatska); HU Hungary/MAGYARORSZÁG (Közép-Magyarország, Közép-Dunántúl, Nyugat-Dunántúl, Dél-Dunántúl, Észak-Magyarország, Észak-Alföld, Dél-Alföld; IT Italy/ITALIA (Piemonte, Valle d'Aosta/Vallée d'Aoste, Liguria, Lombardia, Provincia Autonoma di Bolzano/Bozen, Provincia Autonoma di Trento, Veneto, Friuli-Venezia Giulia, Emilia-Romagna); PL Poland/POLSKA (Łódzkie, Mazowieckie, Małopolskie, Śląskie, Lubelskie, Podkarpackie, Świętokrzyskie, Podlaskie, Wielkopolskie, Zachodniopomorskie, Lubuskie, Dolnośląskie, Opolskie, Kujawsko-pomorskie, Warmińsko-mazurskie, Pomorskie); SI Slovenia/SLOVENIJA (Vzhodna Slovenija, Zahodna Slovenija); SK Slovakia/SLOVENSKO (Bratislavský kraj, Západné Slovensko, Stredné Slovensko, Východné Slovensko)

The overall programme strategy is formulated in direct response to the EU 2020 strategy of smart, sustainable and inclusive growth. Expected impacts:

- *Smart Growth*: to improve sustainable linkages among actors of the innovation systems for strengthening regional innovation capacity and to improve skills and entrepreneurial competences for advancing economic and social innovation; the programme will contribute to a more inclusive and cohesive development by means of stimulating activities (in the fields of accessibility, knowledge and skills, social innovation etc.) that address the needs of disadvantaged groups in order to allow them to better integrate into the labour market. This will facilitate their full participation in society as well as social inclusion and foster the integration of people facing particular difficulties on the labour market, such as older workers, people with disabilities, minorities etc. as laid down in the EU green paper on equality and non-discrimination
- *Sustainable Growth*: To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructures; to improve territorially based low-carbon energy planning strategies and policies supporting climate change mitigation ; to improve capacities for mobility planning in functional urban areas to lower CO₂ emissions; the programme will direct investments towards the most resource-efficient and sustainable options, avoid investments that may have a significant negative environmental or climate impact and to support actions to mitigate any remaining negative effects, take a long-term perspective when “life-cycle” costs of alternative options for investment are compared and encourage the use of green public procurement; the programme aims at Including environmental criteria in procurement procedures (e.g. green procurement procedures), giving preference to environmentally-friendly mobility options for short travel distances; adopting to the possible extent measures for the organisation and implementation of conferences and events in a sustainable way (e.g. reducing printing and using recyclable materials, using video conference facilities); considering resource efficiency and the use of renewable energy to the possible extent, making use of regional supply chains (reducing supply chain length and CO₂ emissions)
- *Inclusive Growth*: The programme will be Integrating equal participation of women and men and actively promoting gender mainstreaming

[Interreg CENTRAL EUROPE Cooperation Programme pp.115-118]

2.3 Overview needs and challenges

The Programme indicates 4 Thematic Objectives (TO);

- *TO1: Strengthening research, technological development and innovation*. Challenges for this objective: concentration of R&D on a few growth poles, low level of R&D activities in rural/peripheral regions, brain drain occurrences and deterioration of competitiveness and risk of unemployment, on-going labour market transformation. Disparities in education and employment. Needs addressed: improved framework for innovation, economic specialisation based on regional potentials, enhanced technology transfer between research, education and business, improved skills and knowledge in the field of innovation throughout central Europe, stronger links and networks between regions and innovation actors.
- *TO4: Supporting the shift towards a low-carbon economy in all sectors*. Challenges for this objective: high dependency on fossil fuels, low gross inland consumption of renewable energy, still increasing energy consumption, inefficient energy use especially in the housing and the public sector, not efficiently exploited potential of renewable energy.

Needs addressed: improved energy efficiency in all sectors (public and private), reduced increase of the energy consumption, increased use of the existing renewable energy potentials.

- *TO6: Protecting the environment and promoting resource efficiency.* Challenges for this objective: natural/semi-natural environment under pressure, natural and cultural heritage endangered through unsustainable use air, water and soil pollution, conflicting land use, high level of land consumption & fragmentation, urban sprawl. Needs addressed: careful use of natural and cultural heritage and resources while maintaining an intact environment, improved quality of life in urban areas, reduced land consumption & prevention of further landscape fragmentation.
- *TO7: Promoting sustainable transport and removing bottlenecks in key network infrastructures.* Challenges for this objective: low accessibility of peripheral regions, new MS transport systems suffer from reduced public transport services, stronger reliance on individual transport leading to social and environmental problems, exhausted public transport infrastructure capacity. Needs addressed: tackle regional accessibility disparities, improve accessibility of cities & regions outside the metropolitan areas and TEN-T corridors, promote environmentally friendly and intelligent public transport systems, focusing on public transport & multi-modal transport systems.

[Interreg CENTRAL EUROPE Programme: Annex 04: Table on the justification for selection or non-selection of thematic objectives]

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1.1: To improve sustainable linkages among actors of the innovation systems and strengthening regional innovation capacity in Central Europe

Priority Axis 1: Strengthening research, technological development and innovation (TO1, IP1b)

- *Brief justification:* There is an uneven distribution of R&D activities over central Europe, significant R&D activities in urban and intermediate regions serve as seed-bed and anchor of innovation in central Europe. There is a high potential for mobilisation of synergies between business and research and investments in product and process innovations but linkages are not sufficiently established. The better linkage of advanced regions will support the competitiveness of transnational and regional clusters in central Europe against changes in world market conditions and the inclusion of horizontal challenges (e.g. globalisation, gender issues). The improvement of framework conditions for R&D and innovation will support the characteristics of the CENTRAL EUROPE programme area being a potential destination for foreign investments and capital flows. The fostering of links between business and research increases competitiveness and decreases the risk of brain drain in the CENTRAL EUROPE programme area. The improvement of skills and knowledge of human capital and of entrepreneurs is an important factor for increased innovation capacity in the CENTRAL EUROPE programme area.
- *Main change sought:* Increased and more sustainable linkages of actors in the innovation systems achieved through transnational cooperation strengthening the innovation capacity within the central European regions.
- *Expected activities:* To improve sustainable linkages among actors of the innovation systems for strengthening regional innovation capacity in central Europe.

- *Beneficiaries:* all legal personalities that can contribute to increasing economic and social innovation and entrepreneurial capacity. They comprise amongst others: local, regional and national public authorities, regional development agencies, chambers of commerce, enterprises (including SMEs), cluster organisations, universities, associations, technology transfer institutions, research institutions, centres of R&D excellence, NGOs, innovation agencies, business incubators, cluster management bodies, financing institutions, education and training organisations as well as social partners and labour-market institutions.

Specific objective 1.2: To improve skills and entrepreneurial competences for advancing economic and social innovation in central European regions

Priority Axis 1: Strengthening research, technological development and innovation (TO1, IP1b)

- *Brief justification:* The promotion of innovation potentials in rural regions encourages impulses for a sustainable and balanced territorial development and will foster economic and social cohesion. The promotion of skills and competences in peripheral and shrinking regions – being targeted from long-term (demographic) transformation processes – may reduce the increasing lagging behind of peripheral, badly accessible regions. Fostering additional knowledge and skills in the field of economic and social innovation (with a specific focus on SMEs) will increase the entrepreneurial spirit within the regions and improve the endogenous economic potential thus reducing out-migration in peripheral regions.
- *Main change sought:* Improved capacities of the private and public sector for skills development of employees and entrepreneurial competences achieved through transnational cooperation driving economic and social innovation in central European regions.
- *Expected activities:* To improve skills and entrepreneurial competences for advancing economic and social innovation in central European regions.
- *Beneficiaries:* see SO 1.1

Specific objective 2.1: To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructures

Priority Axis 2: Environment and Resources (TO 4, IP4c)

- *Brief justification:* There is a need for increase of renewable energy production, especially in eastern central Europe. Efficient use of energy can contribute to decreasing central Europe's energy import dependence and mitigating climate change. The promotion of endogenous resources and energy technologies is a high potential but capacities are often limited. The sectors housing, public services and transport are among the biggest energy consumers – especially in urban areas. Their energy use is still wasteful in many regions in central Europe. Potential new green jobs contribute to increase the competitiveness of regions and to reduce unemployment. The implementation of low-carbon strategies supports the reductions of greenhouse gas emissions and of central Europe's existing dependency on fossil energy.
- *Main change sought:* Improved capacities of the public sector and related entities for increased energy efficiency and renewable energy use of public infrastructure in central Europe achieved through transnational cooperation.
- *Expected activities:* To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructures.
- *Beneficiaries:* actors that can contribute to an increase of energy efficiency of public infrastructures. They comprise among others local, regional and national public authorities

and related entities, regional development agencies, energy suppliers, energy management institutions and enterprises, the construction sector, regional associations, regional innovation agencies, NGOs, financing institutions, education and training centres as well as universities and research institutes.

Specific objective 2.2: To improve territorially based low-carbon energy planning strategies and policies supporting climate change mitigation

Priority Axis 2: Environment and Resources (TO 4, IP4e)

- *Brief justification:* The use of available knowledge on renewable energy of some central European regions is a great potential for lagging regions. There is the need for increasing the capacity of the public sector for energy efficiency measures.
- *Main change sought:* Improved capacities of the public sector and related entities for territorially based low carbon energy planning and policies in central European regions achieved through transnational cooperation.
- *Expected activities:* To improve territorially based low-carbon energy planning strategies and policies supporting climate change mitigation.
- *Beneficiaries:* all legal personalities that can contribute to improved energy and low-carbon mobility planning. They comprise among others local, regional and national public authorities, regional development agencies, energy operators, energy management institutions, enterprises including SMEs, public transport operators, associations, innovation agencies, NGOs, financing institutions, education and training organisations as well as universities and research institutes.

Specific objective 2.3: To improve capacity for mobility planning in functional urban areas to lower CO₂ emissions

Priority Axis 2: Environment and Resources (TO 4, IP4e)

- *Brief justification:* Promoting more environment friendly and sustainable low-CO₂ urban transport systems contributes to tackle air quality problems (including high concentrations of particulate matters and ozone) and fosters the regional quality of life as well as economic conditions especially around urban nodes.
- *Main change sought:* Improved capacities of the public sector and related entities for low carbon mobility planning in central Europe's functional urban areas achieved through transnational cooperation.
- *Expected activities:* To improve capacities for mobility planning in functional urban areas to lower CO₂ emissions.
- *Beneficiaries:* see SO 2.2.

Specific objective 3.1: To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources

Priority Axis 3: Human resources development (TO6, IP6c)

- *Brief justification:* The richness of central Europe's natural and cultural resources needs to be preserved and their management improved. The sustainable use of natural and cultural resources serves as important location factor but they are often not sufficiently used.
- *Main change sought:* Improved integrated environmental management capacities of the public sector and related entities for the sustainable use of natural heritage and resources in central Europe achieved through transnational cooperation.
- *Expected activities:* To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources.

- *Beneficiaries:* all legal personalities that can contribute to an improved management and sustainable use of natural and cultural heritage and resources. They comprise among others local, regional and national public authorities, regional development agencies, enterprises (in particular SMEs within the cultural and creative industry as well as the environmental sector), associations, regional innovation agencies, special interest groups, NGOs, financing institutions, education and training organisations as well as universities and research institutes.

Specific objective 3.2: To improve capacities for the sustainable use of cultural heritage and resources

Priority Axis 3: Human resources development (TO6, IP6c)

- *Brief justification:* Transnational cooperation can help to coordinate sustainable management of natural and cultural resources. Natural and cultural heritage sites are not sufficiently linked. Pressures on natural and cultural resources endanger the use potentials.
- *Main change sought:* Improved capacities of the public and private sector and related entities for the sustainable use of cultural heritage and resources in central Europe achieved through transnational cooperation.
- *Expected activities:* To improve capacities for the sustainable use of cultural heritage and resources.
- *Beneficiaries:* see SO 3.1

Specific objective 3.3: To improve environmental management of functional urban areas to make them more livable places

Priority Axis 3: Human resources development (TO6, IP6e)

- *Brief justification:* The environmental challenges of air, water and soil pollution, climate, land consumption and land use conflicts and negative spill-over effects in agglomeration areas are development barriers. Negative external effects of urban areas (agglomeration disadvantages, resulting in e.g. low air quality, etc.) are a major challenge for central.
- *Main change sought:* Improved integrated environmental management capacities of the public sector and related entities in central Europe's functional urban areas achieved through transnational cooperation for making them more liveable places.
- *Expected activities:* To improve environmental management of functional urban areas to make them more livable places.
- *Beneficiaries:* all legal personalities that can contribute to improved environmental management of functional urban areas. They comprise among others local, regional and national public authorities, regional development agencies, enterprises, environmental facilities and infrastructure operators and owners, associations, regional innovation agencies, special interest groups, NGOs, financing institutions, education and training organisations as well as universities and research institutes.

Specific objective 4.1: To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks

Priority Axis 4: Sustainable networks and institutional cooperation (TO7, IP7b)

- *Brief justification:* Weak regional and local accessibility exists outside of central Europe's agglomerations. There is a notable accessibility gap between peripheral rural regions and economic centres and to the TEN-T network. Disparities in multimodal accessibility lower the competitiveness of many regions in central Europe. The promotion of the quality of rural-urban connections (as well as regiopolises and surrounding areas) may reduce the gap between peripheral areas and centres. Better regional accessibility con-

tributes to increase the involvement of peripheral, regions into the development process and to reduce regional shrinkage.

- *Main change sought:* Improved and coordinated planning capacities of the public sector and related entities for regional passenger transport systems in central Europe linked to national and European transport networks achieved through transnational cooperation.
- *Expected activities:* To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks.
- *Beneficiaries:* all legal personalities that can contribute to improved regional passenger transport. They comprise among others local, regional and national public authorities, regional development agencies, enterprises, public transport operators, infrastructure providers, regional associations, regional innovation agencies, NGOs, financing institutions, education and training organisations as well as universities and research institutes.

Specific objective 4.2: To improve coordination among freight transport stakeholders for increasing multimodal environmentally-friendly freight solution

Priority Axis 4: Sustainable networks and institutional cooperation (TO7, IP7c)

- *Brief justification:* The implementation of environment-friendly and low-carbon freight transport systems and logistics will contribute to the 2020 targets of reduction of greenhouse gas emissions and increase in energy efficiency. Increasing transport volumes reinforce the need for environmental-friendly and low-carbon freight transport systems. Disparities exist in multimodal accessibility for freight transport in central Europe
- *Main change sought:* Improved coordination among freight transport stakeholders for increasing multimodal environment-friendly freight solutions in central Europe achieved through transnational cooperation.
- *Expected activities:* To improve coordination among freight transport stakeholders for increasing multimodal environmentally-friendly freight solutions.
- *Beneficiaries:* all legal personalities that can contribute to improving freight transport. They comprise among others local, regional and national public authorities, regional development agencies, enterprises, transport operators including operators of multimodal logistics hubs, infrastructure providers, transport associations, regional innovation agencies, NGOs, financing institutions, education and training organisations as well as universities and research institutes.

Programme coordination and synergies with the ESI Funds and other EU instruments

ESI Funds: the programme has potential for facilitating the implementation of national and regional programmes supported by the ERDF, ESF, Cohesion Fund, EAFRD and EMFF by allowing stakeholders to tackle common challenges and needs beyond administrative borders. Coordination and complementarity with other ESI funds is key, especially in terms of investment planning and preparation which can be accomplished at regional and local levels based on operations supported by the Interreg CENTRAL EUROPE Programme. Already in the 2007-2013 period transnational cooperation operations demonstrated their ability to prepare ground for medium to large-scale investments, not only in terms of development of technical specifications for investments but also in terms of building knowledge and capacity, mobilising critical mass as well as creating and strengthening ownership. Regarding coordination with other ESI funds, special attention will be given to the possibility of coordination with other programmes of the European Territorial Cooperation (ETC) objective. In this regard the Inter-

reg CENTRAL EUROPE Programme will seek exchanges with the managing authorities of other, geographically overlapping ETC programmes.

Other Union instruments: coordination between ETC programmes and other Union instruments has the potential to raise the impact of Union policies at national and regional level supporting local, regional and national investments that effectively contribute to the Europe 2020 strategy. (Horizon 2020, COSME, LIFE, TEN-T, Connecting Europe Facility, Creative Europe and Erasmus)

ENI and IPA: the programme will seek coordination with the external policy instruments of the European Union: the Pre-Accession Instrument (IPA) and the European Neighbourhood Instrument (ENI). Even if the programme does not benefit of IPA and ENI funding, spreading and following up on outputs and results of Interreg CENTRAL EUROPE operations in bordering candidate countries and non-European countries could contribute both to their accession process (applicable to Serbia, Montenegro and Bosnia Herzegovina) and to a harmonious neighbourhood (applicable to Ukraine and Belarus).

Relevant national funding instruments: transnational operations supported by the programme have the potential to improve the implementation of national, regional and local policies and of the related funding instruments. In this respect, potentials for coordination and complementarity can be seen in preparing investment to be realised with national funding, as well as in applying national incentives in the thematic sectors addressed by the programme (e.g. de-taxation of expenditure and other incentive mechanisms applied at national level for R&D initiatives by enterprises and/or for energy efficiency and renewable energy usage interventions of enterprises and households).

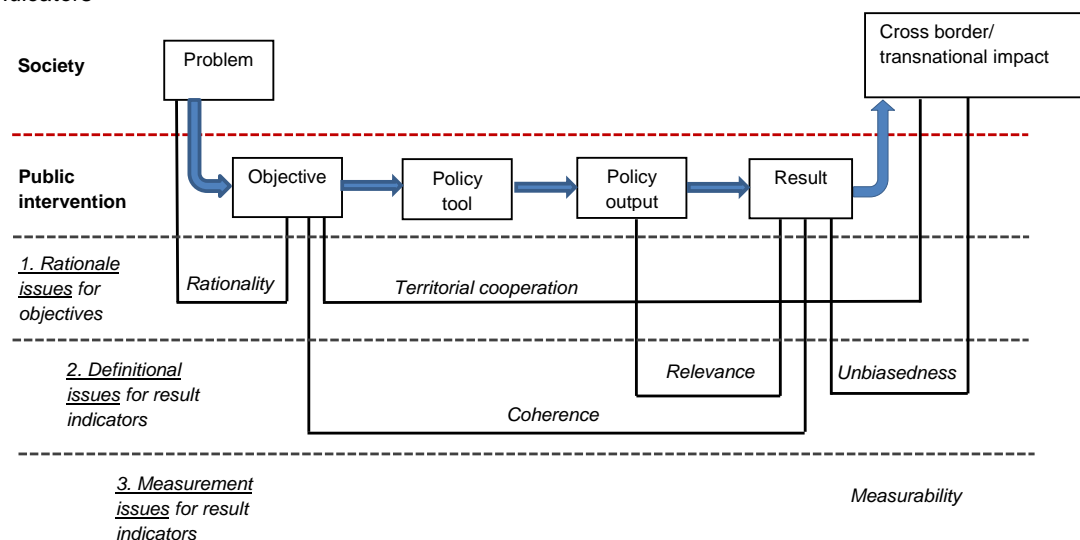
EIB: Preparation of large-scale investment represents a relevant share of outputs delivered by operations within the Interreg CENTRAL EUROPE Programme. Transnational cooperation can therefore contribute to making results of operations ready for benefitting of instruments of the European Investment Bank (EIB), both in terms of technical preparation and execution of large-scale investment (i.e. make them “bankable”). (E.g. JASPERS, JESSICA, ELENA, JEREMIE)

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.²

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.³ In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

² This framework was discussed in details in section 2.2 of the Inception Report.

³ Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*⁴:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

⁴ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁵ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁵ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
1	To improve sustainable linkages among actors of the innovation systems for strengthening regional innovation capacity in central Europe	Status of linkages among actors of the innovation systems achieved through transnational cooperation in central European regions (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document) -> SURVEY + FOCUS GROUP	HIGH	HIGH	LOW - The result indicator does not capture innovation capacity but how the stakeholders perceive it	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
1	To improve skills and entrepreneurial competences for advancing economic and social innovation in central European regions	Status of capacities of the public and private sector for skills development of employees and entrepreneurial competences achieved through transnational cooperation driving economic and social innovation in central European regions (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	HIGH	HIGH	LOW - The result indicator does not capture the achievement of the objective but how the stakeholders perceive it	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
4	To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructures	Status of capacities of the public sector and related entities for increased energy efficiency and renewable energy use in public infrastructures achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	MEDIUM - The social problem is the necessity to reduce renewable energy consumption and efficient energy use. The objective is only partially addressing this issue.	LOW - It is not fully clear how territorial cooperation will help achieving this result	LOW - The result indicator does not capture the achievement of the objective but how the stakeholders perceive it	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
4	To improve territorially based low-carbon energy planning strategies and policies supporting climate change mitigation	Status of capacities of the public sector and related entities for territorially based low-carbon energy planning and policies achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	MEDIUM - The social problem is the necessity to reduce renewable energy consumption and efficient energy use. The objective is only partially addressing this issue.	LOW - It is not fully clear how territorial cooperation will help achieving this result	LOW - The result indicator does not capture the achievement of the objective but how the stakeholders perceive it	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
4	To improve capacities for mobility planning in functional urban areas to lower CO2 emissions	Status of capacities of the public sector and related entities for low-carbon mobility planning in functional urban areas achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	MEDIUM - The social problem is the necessity to reduce CO2 emissions. The objective is only partially addressing this issue.	HIGH	LOW - The result indicator does not capture the achievement of the objective but how the stakeholders perceive it	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
6	To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources	Status of integrated environmental management capacities of the public sector and related entities for the protection and sustainable use of natural heritage and resources achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - The social problem is the sustainable management of natural resources. The objective is only partially addressing this issue. In addition, there is a potential overlapping with the next objective	LOW - It is not fully clear how territorial cooperation will help achieving this result	LOW - The result indicator does not capture the achievement of the objective but how the stakeholders perceive it	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
6	To improve capacities for the sustainable use of cultural heritage and resources	Status of capacities of the public and private sector for the sustainable use of cultural heritage and resources achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - The social problem is the sustainable management of natural resources. The objective is only partially addressing this issue. In addition, there is a potential overlapping with the previous objective	HIGH	LOW - The result indicator does not capture the achievement of the objective but how the stakeholders perceive it	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
6	To improve environmental management of functional urban areas to make them more liveable places	Status of integrated environmental management capacities of the public sector and related entities in functional urban areas achieved through transnational cooperation for making them more liveable places (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - The social problem is the environmental quality in cities. The objective is only partially addressing this issue.	LOW - It is not fully clear how territorial cooperation will help achieving this result	LOW - The result indicator does not capture the achievement of the objective but how the stakeholders perceive it	HIGH	LOW - How is "liveability" defined? Different stakeholders might have a different perception of the issue	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
7	To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks	Status of coordinated planning capacities of the public sector and related entities for regional passenger transport systems linked to national and European transport networks achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	MEDIUM - The social problem is the necessity to increase passengers' accessibility. The objective is only partially addressing this issue.	HIGH	LOW - The result indicator does not capture the achievement of the objective but how the stakeholders perceive it	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)
7	To improve coordination among freight transport stakeholders for increasing multimodal environmentally-friendly freight solutions	Status of coordination among freight transport stakeholders for increasing multimodal environmentally-friendly freight solutions achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology as described in annex 08 in cooperation programme document)	MEDIUM - The social problem is the necessity to reduce pollutant emissions generated by freight transport. The objective is only partially addressing this issue.	HIGH	LOW - The result indicator does not capture the achievement of the objective but how the stakeholders perceive it	HIGH	HIGH	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁶ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁶ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

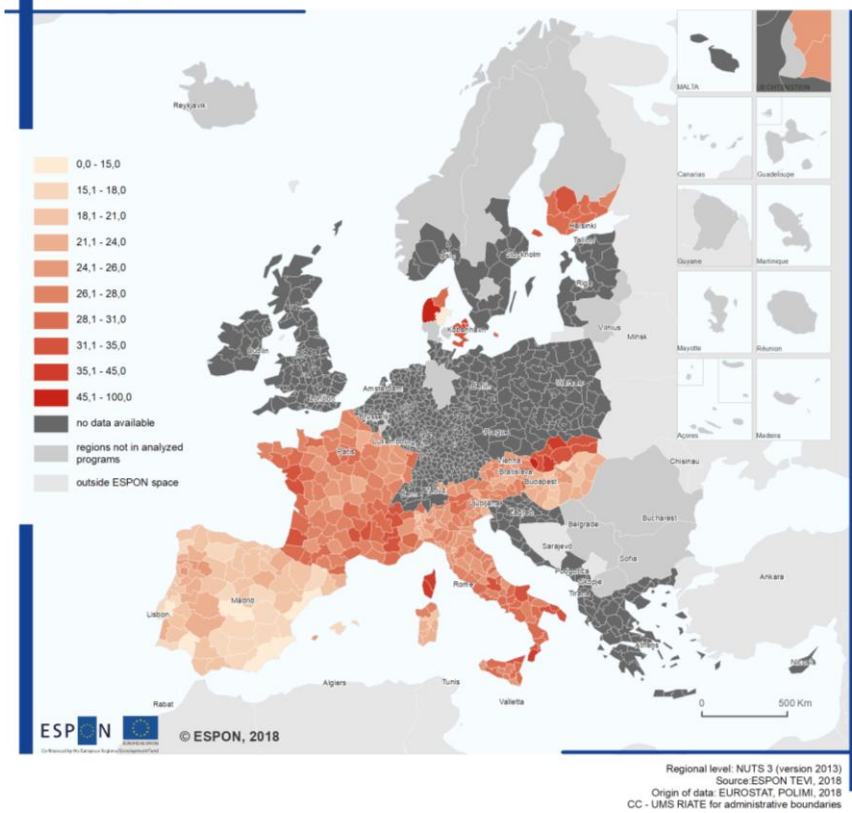
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Programme	ETC objective	Thematic objective	Specific objective	Result indicator	Measurability	Proposed result indicator
Central Europe (1)		1	To improve sustainable linkages among actors of the innovation systems for strengthening regional innovation capacity in central Europe	Status of linkages among actors of the innovation systems achieved through transnational cooperation in central European regions (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document) -> SURVEY + FOCUS GROUP	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)	Number of scientific products (patents, papers) co-authored by cross-border actors (to be controlled for other influential factors through DID)
Central Europe (2)		1	To improve skills and entrepreneurial competences for advancing economic and social innovation in central European regions	Status of capacities of the public and private sector for skills development of employees and entrepreneurial competences achieved through transnational cooperation driving economic and social innovation in central European regions (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)	Synthetic indicator: number of start ups + employment in skilled professions
Central Europe (3)		4	To develop and implement solutions for increasing energy efficiency and renewable energy usage in public infrastructures	Status of capacities of the public sector and related entities for increased energy efficiency and renewable energy use in public infrastructures achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)	Energy consumption in public buildings (kWh/ m ²) (to be controlled for other influential factors through DID)
Central Europe (5)		4	To improve capacities for mobility planning in functional urban areas to lower CO ₂ emissions	Status of capacities of the public sector and related entities for low-carbon mobility planning in functional urban areas achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)	Amount of CO ₂ emissions (source: OECD) (to be controlled for other influential factors through DID)
Central Europe (6)		6	To improve integrated environmental management capacities for the protection and sustainable use of natural heritage and resources	Status of integrated environmental management capacities of the public sector and related entities for the protection and sustainable use of natural heritage and resources achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)	Per capita number of Natura 2000 sites
Central Europe (7)		6	To improve capacities for the sustainable use of cultural heritage and resources	Status of capacities of the public and private sector for the sustainable use of cultural heritage and resources achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)	Synthetic indicator: tourism presences + seasonality of tourism + Natural sites in good conditions
Central Europe (8)		6	To improve environmental management of functional urban areas to make them more liveable places	Status of integrated environmental management capacities of the public sector and related entities in functional urban areas achieved through transnational cooperation for making them more liveable places (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)	Level of satisfaction with services of general interest in cities (source: Flash Eurobarometer) (to be controlled for other influential factors through DID)
Central Europe (9)		7	To improve planning and coordination of regional passenger transport systems for better connections to national and European transport networks	Status of coordinated planning capacities of the public sector and related entities for regional passenger transport systems linked to national and European transport networks achieved through transnational cooperation (Semi-quantitative (Likert scale) see methodology in annex 08 in cooperation programme document)	LOW - Survey studies and focus groups are difficult to be replicated (high costs), not comparable with other areas (lack of data)	Travel time to the nearest national and EU transportation hubs

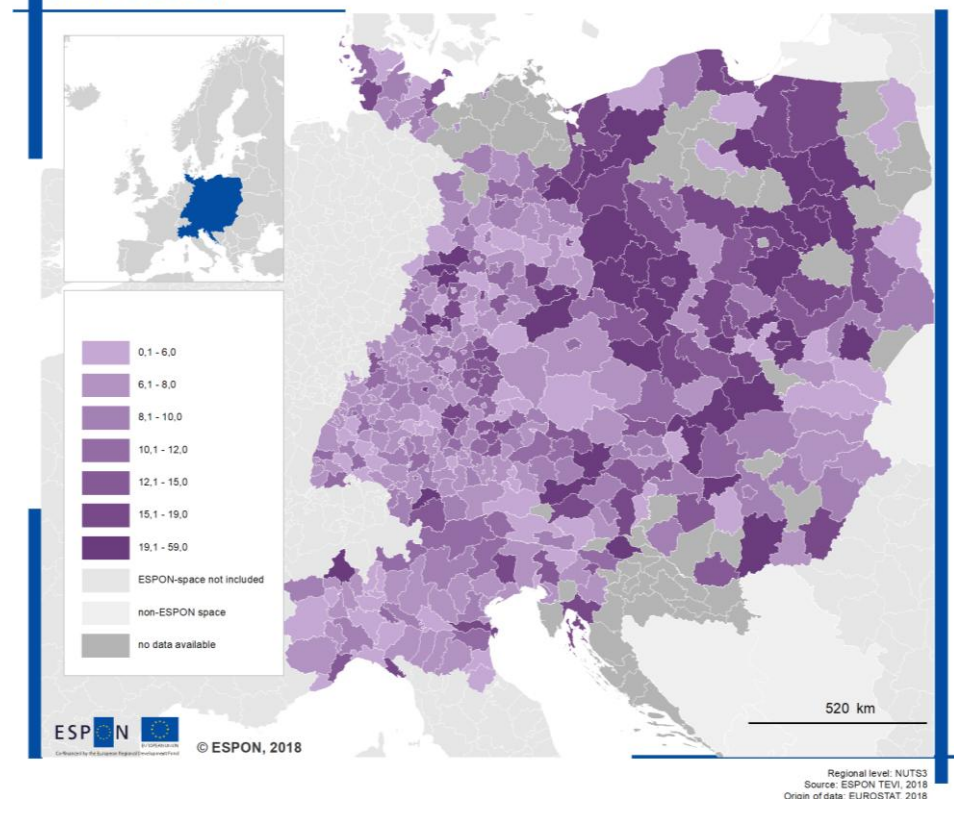
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)

Composite Indicator: patent applications + trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined timeperiod. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁷ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁸

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. A minimum of 0.2 can be observed, with corresponding maximum of 200. Minima are found mostly in rural areas with a slightly higher concentration in parts of Eastern Germany, Eastern Poland and Hungary. Maxima are found along urban centres, for example NUTS-3 regions around Berlin, Munich and Milano.

Increases in value added, in comparison with the European context, remain relatively low. Certain economically more successful sets of regions (for example Northern Italy and Southern Germany) stand out in the European context. For the largest part, added value generation patterns follow European wide trends, with significant generation in urban centres and a lim-

⁷nama_10r_3gva

⁸nama_10r_3empers

ited degree of (generally urbanised) clusters. In the European context, added value growth has been especially low in the Western Poland and Eastern Germany, pointing to a larger degree of stagnation within the programme area.

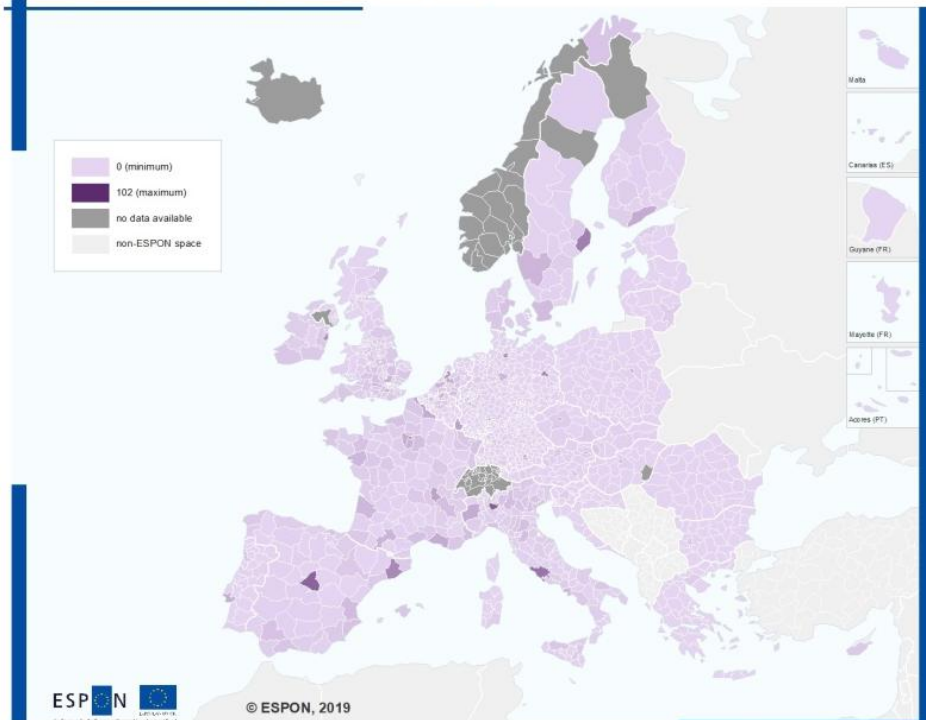
The pattern of dispersion of value added generation in knowledge intensive sectors around Europe is primarily city-driven. Generally, urban centres generate sizeably more value added growth in knowledge intensive sectors, than rural and peri-urban regions. This is especially visible on the western flank of the programme area, with region concentration in the metropolitan areas of Berlin and Munich. Surrounding areas generally feature relatively lower rates of growth, pointing towards the existence of hinterlands which primarily supply urban areas with labour, as opposed to housing knowledge intensive industries or services themselves. These commuter belts can also be observed in other parts of the programme area, e.g. around Budapest and Prague.

Another identified pattern is the existence of groups of regions with moderate to high growth in value added in knowledge intensive sectors. These are predominantly found in Northern Italy around Milan, Bologna and Torino. Similar patterns can also be observed in the German state of Baden Württemberg.

Large tracts of the programme area feature reduced value added growth. This is particular visible in corridors around regional maxima (such as around Berlin and Carinthia). Especially in the eastern regions of the programme area, entire countries feature low to medium growth, with little variance. Eastern Hungary, Slovakia, as well as significant parts of central Poland and Croatia are characterised by this phenomenon. Border regions tend to also feature relatively low growth in value added, in line typical industrial characteristics border regions.

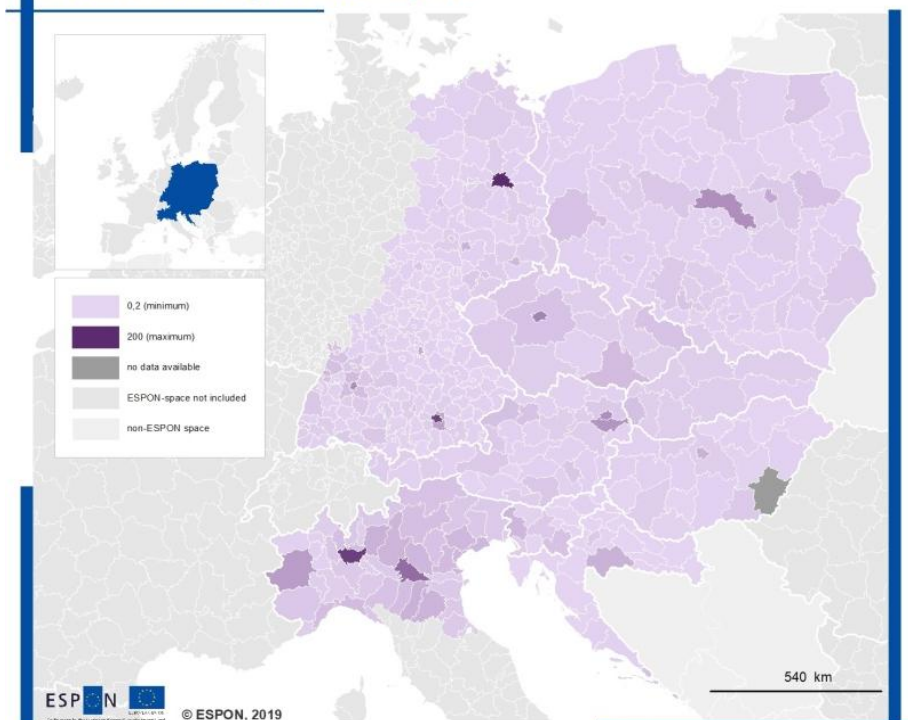
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR
 © UMS RIAE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR

4.2 Innovation

The maps below present the synthetic composite indicator *Innovation* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Innovation in the framework of the indicator is restricted to technical innovation via patent and trademark registration, thus not necessarily reflecting the status of social innovations. The composite indicator quantifies the innovation outputs undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework innovative economic activities. The indicator is calculated in the following manner:

$$Innovation = \frac{1}{2} * P_{i,t} + \frac{1}{2} * T_{i,t}$$

In which the variable $P_{i,t}$ represents normalised patent application values per NUTS-3 region to the European Patent Office in region i and at time t . Analogously, $T_{i,t}$ represents normalised trademark applications in a given region i and at time t . Thus, the indicator captures scientific and technical innovation, in addition to capturing process innovation via new products and similar by companies. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁹ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Trademark values on NUTS-3 level are obtained via the indicator European Union trade mark (EUTM) applications by NUTS 3 regions¹⁰.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. A minimum of 0.1 can be observed, with corresponding maximum of 103.7. Minima are found in rural hinterlands, generally clustered around large urban agglomerations. Maxima are found in urban centres, for example NUTS-3 regions around Berlin and Milano, as well as with a relatively higher density in Northern Italy and Southern Germany.

In the European context, innovation (measured by patent and trademark application) is concentrated along urban areas and clusters of R&D institutions. These regions tend to be rela-

⁹ tgs00041

¹⁰ ipr_ta_reg

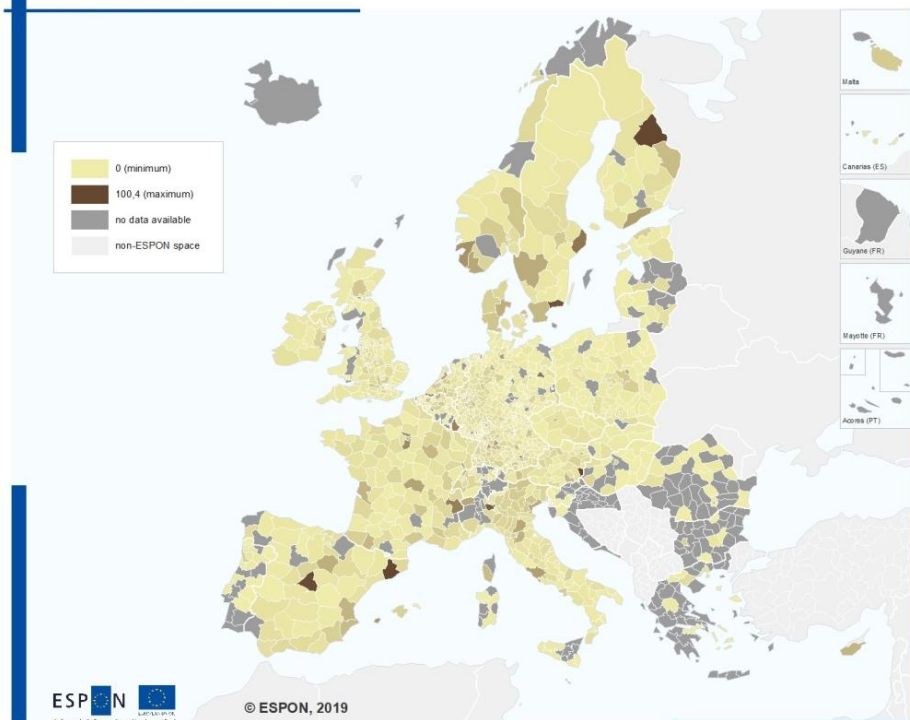
tively richly endowed in human capital with strong research institutions. Varying patterns can be identified. In some areas, a concentration of innovative activities to regional centres, generally capital cities, can be observed. This pattern is strongly observable on the Iberian peninsula with regional extrema in Madrid and Barcelona. Surrounding regions of these centres tend to feature a very low degree of innovative output. Another observable pattern are large clusters of regions, featuring moderate to high innovation output. These clusters generally rank in the mid-fields in terms of absolute indicator scores. Examples of these (sometimes large) clusters include Northern Italy (with a regional extrema in Milano and a surrounding cluster of moderately to well scoring regions), the Dutch region of Holland and Southern Germany.

The programme area features a significant number of innovation clusters which also stand out on the European scale in terms of their raw innovative output. On a more regionalised scale, these clusters (i.e. Northern Italy and Baden Württemberg, the Munich cluster) retain their relatively strong performance. Smaller scale clusters are observable in Upper Austria and around Warsaw. Localised extrema can also be observed, generally in highly urbanised areas with strong R&D infrastructure. Relevant examples are Vienna and Berlin, both featuring a high degree of innovative output growth, with a corresponding lower performing residential belt surrounding them.

Innovative output growth is correspondingly lower in the eastern regions of the programme area. Romania, Slovakia and Hungary feature homogenous low growth. In the Czech Republic and Poland, mild polarisation in and around the capital cities of Prague and Warsaw can be observed. Poland stands out with many regional anomalies: in the cases of the urban agglomerations of Lodz and Poznan, innovation output growth is relatively higher in the belts of the cities, than in the urban centres themselves.

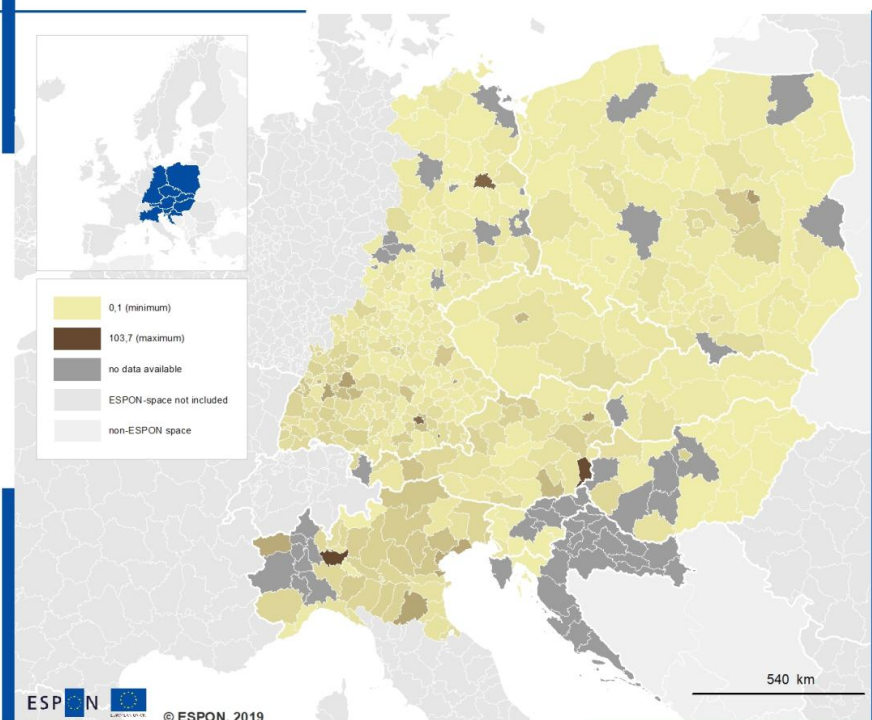
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoIMI, OIR
 © UMS RIATE for administrative boundaries

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoIMI, OIR

4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies developments in tourism and sustainability undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations and inverted. The indicator stems from Eurostat and is available in monthly intervals at national level¹¹. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹² is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹³. This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 1 can be observed with corresponding maximum of 103.3. Minima are found to a large extent in Poland and Hungary, as well as parts of Northern Italy. Maxima are concentrated along the German Baltic Sea coast, parts of the Czech Republic, as well as large parts of Slovenia and Slovakia.

As the indicator *sustainability* measures both increases in tourism, as well as its detrimental impacts (via potential changes to the environment, measured by the annual seasonality of

¹¹ tour_occ_nim

¹² Source: EEA, DG REGIO

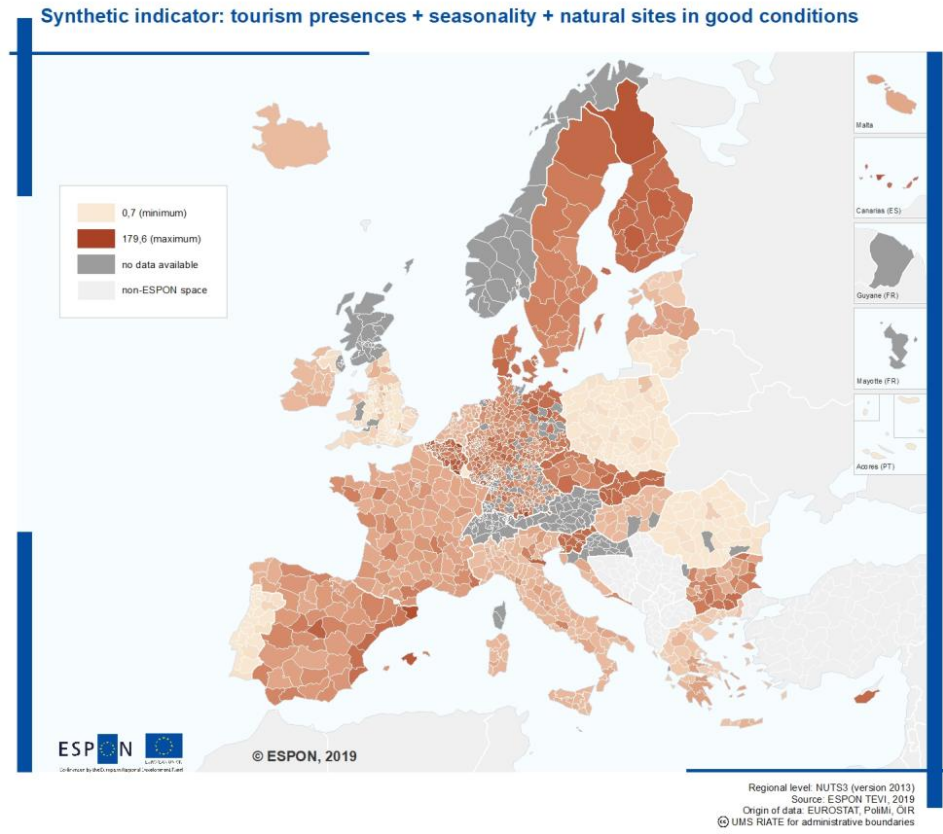
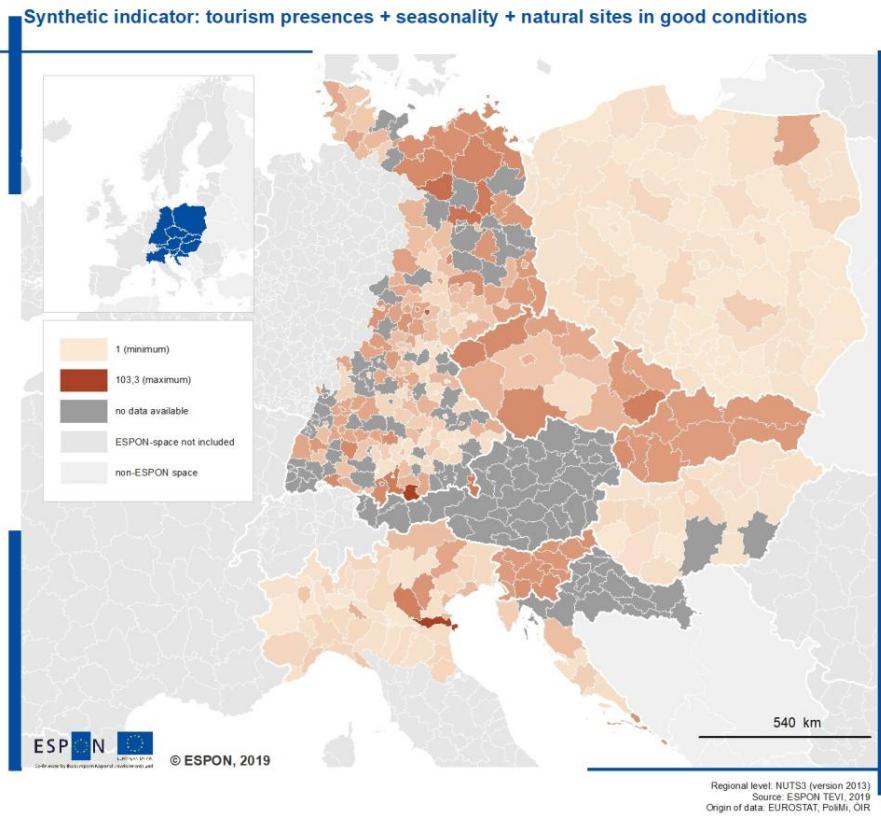
¹³ tour_occ_anor2

tourism and changes in NATURA 2000 sites), a higher scoring region is not necessarily a region which is attracting substantially more tourists, but may shine in other aspects (e.g. low seasonality of tourism). This can be observed in the maps below on European scale and across the programme area.

On European scale, several kinds of well performing regions can be identified: regions with predominantly low seasonality of tourism (e.g. regions within Belgium), regions with a large NATURA 2000 surface area in relation to their size (particularly Northern Sweden and Finland) and regions attracting a large degree of tourists (South-eastern Spain and Balearic Isles). Vice versa, there are also substantially many regions which may perform relatively well in one area (e.g. tourism), however, with a relatively low rating due to significant underperformance in other factors (e.g. concentrated seasonality around summer months). An example of this is Portugal. Most regions in the middle ground across Europe feature a combination of one of the factors outlined above with a relatively low rating in one of the other factors. An illustration of this phenomenon is Northern Italy, which boasts high popularity in terms of overnight stays, however, concentrated along summer months.

In the programme area, especially Northern Italy, Poland in its near entirety, Hungary and Southern Croatia stand out as relatively worse ranked. As outlined above, both the regions of Northern Italy and Croatia feature a large number of overnight stays with a very high degree of seasonality. Polish and Hungarian regions feature a relatively low influx of tourists, thus placing them on the bottom of the list. However, in both cases, per-urban regions tend to outperform their urban peers. Slovenian regions boast a relatively large influx of overnight stays in combination with a large relative NATURA 2000 surface area. This can also be observed along the German-Czech and Austrian-Czech border regions, which experienced growth in tourism in combination with a relatively large NATURA2000 surface area. Urban centres generally feature medium range scores, due to very low ranking in terms of NATURA 2000 surface area despite generally performing relatively better in terms of seasonality and attractiveness to visitors.

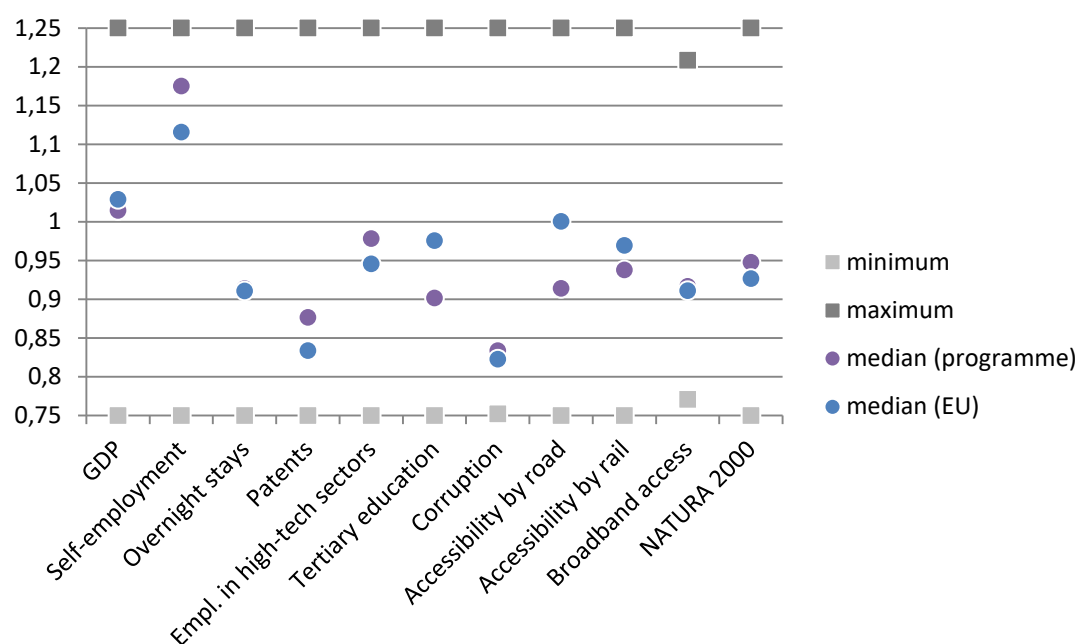
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions



4.4 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The Central Europe Programme Area performs relatively well in patent generation, self-employment, and employment in high technology industries. A relative large range of values across the programme regions is observed across all presented indicators, indicating a large degree of heterogeneity across the programme area. In some cases, the Programme Area is performing worse than EU average, namely in share of persons with completed tertiary education and accessibility by rail.

5 Reference Analysis

5.1 Revised SWOT Analyses per Thematic Objective

Table 5.1: SWOT Analysis

	Strength	Weaknesses	Opportunities	Threats
TO 1 Research, technological development and innovation	<p>Growth in business-related services, cross-sectorial and technology-oriented industries</p> <p>High expenses in R&D in urban regions, attractive labour markets for highly skilled workers</p> <p>Some rural and intermediate areas show significant R&D activities ("islands of innovation")</p> <p>High level of experience and know-how in high-tech services</p> <p>Support of several clusters by different national strategies</p>	<p>Low level of R&D in several (rural) regions</p> <p>Insufficient technology transfer and lack in the access to R&D-results especially for SMEs</p> <p>Strong economic disparities between central European regions, comparably lower levels of R&D in New Member States</p> <p>Inequalities in GDP between peripheral and central areas</p>	<p>Promotion of innovation and an attractive investment climate</p> <p>Positive influence of growth poles</p> <p>Policy support for cooperative economic activities, development of clusters and networks</p>	<p>Increasing gaps between advanced regions and regions with innovation deficits</p> <p>Brain drain of young and creative talents from peripheral regions</p> <p>Increasing (labour) market competition with other global regions (China, India) and pressure on economic productivity</p>
TO 2 ICT	<p>Most of the capital regions in central Europe and the southern Germany boast high levels of high-speed internet connections</p> <p>Frog-leaping of technological progress in terms of ICT-quality in some regions (broadband implementation)</p>	<p>Sectorial and spatial inequalities of ICT-infrastructure</p> <p>Broadband coverage in thinly populated areas generally lags behind that in densely populated ones</p> <p>Increasing gaps between well connected regions and those with ICT deficits</p>	<p>Mobile technologies can play a key role in closing the gap of ICT coverage between thinly and densely populated areas</p>	<p>Expensive infrastructure investments for broadband extension</p>
TO 3 Competitiveness of SMEs	<p>In some regions local enterprises/SMEs show high levels of innovation</p> <p>SMEs are the seedbed for technological innovation and in combination with good education levels, entrepreneurs may act as regional innovation motors</p>	<p>Strong economic regional disparities</p> <p>Access to finance still remains fragmented and out of line with current needs, especially for start-ups</p> <p>Deficits in "green" employment forms, creative industries and cooperative SMEs (clusters, networks)</p>	<p>Expansion of action radii due to enlargement processes</p> <p>Enhancement of competitiveness and deregulation for triggering SME development</p> <p>Globalisation and EU enlargement as a means for accessing new markets and capital</p>	<p>Over-regulation in some policy fields (e.g. national market protection, social security, labour markets)</p> <p>Lack of availability of a sufficiently trained workforce as reason for losing the ground in competitiveness in a globalized world</p>
TO 4 Low-carbon economy in all sectors	<p>High level of experience and know-how in renewable energy</p> <p>Increase of clean energy production (wind, solar, biomass, hydro-</p>	<p>Increasing energy demand and lack of energy corridors and power lines especially for renewable</p>	<p>Increasing prices for fossil fuels open up opportunities for the use of renewable energy resources</p>	<p>Existing lifestyles in "mature" economies and catching up processes in new MS lead to increased</p>

	Strength	Weaknesses	Opportunities	Threats
	<p>power, geothermal energy)</p> <p>High percentage of biomass production in some regions</p> <p>Existing geothermal energy potentials</p> <p>Use of energy saving technologies (infrastructure/housing) in some regions</p>	<p>energy</p> <p>High level of energy import dependency and imports from countries vulnerable to economic or political instability</p> <p>Use of renewable energy resources still low in new MS (e.g. Czech Republic, Poland, Slovakia)</p> <p>Low energy efficiency in regions of Eastern and South-Eastern Europe and in public institutions</p> <p>High energy intensive transport</p>	<p>and the creation of new sources of income and employment</p>	<p>energy demand</p> <p>Transport is the fastest growing sector in terms of energy use, with the strongest reliance on fossil fuel</p>
<p>TO 5</p> <p>Climate change adaptation, risk prevention and management</p>	<p>Existing flood prevention measures and hazard zoning, especially in Alpine regions</p>	<p>High water dependency of some regions due to intensive agriculture or hydro-power use</p> <p>New MS are more vulnerable to a significant climate change impact on summer tourism</p> <p>High probability of floods along river basins (most vulnerable: Germany, Western Poland)</p>	<p>Increasing awareness about climate change effects and adaptation measures</p>	<p>Increasing occurrences of natural hazards and floods</p> <p>Increase of average air temperature (e.g. continuous reduction of blanket of snow)</p> <p>Climate change affecting nature (e.g. extinction of species; geographical shift of crops) and increasing aridity in some regions as well as strongly increasing the number of tropical nights in urban areas</p> <p>Risk of hydro-geological instability</p>
<p>TO 6</p> <p>Environment and resource efficiency</p>	<p>Richness and diversity of landscape, natural and cultural heritage (important location factors)</p> <p>Use of endogenous potential to strengthen regional identity</p> <p>Italy, Hungary and Slovenia have a higher share of protected areas than the EU-27 average</p> <p>Waste water treatment capacity is very high in Slovakia, Slovenia, Austria and Germany</p>	<p>Fragmentation, loss and diminishing diversity of natural areas, missing ecosystem-networks</p> <p>Land use pressure leading to user conflicts, landscape fragmentation and biodiversity loss</p> <p>Low air quality and high particular matter & ozone concentration in cities</p> <p>Bad water quality</p>	<p>Integrated management of natural and cultural resources contributes to sustainable long-term socio-economic development of regions</p> <p>Establishment of a high proportion of protected areas through EU funds and policies</p> <p>Cohesion Policy focusing on environmental infrastructure, includ-</p>	<p>Increasing unsustainable use of environmental resources due to economic activities</p> <p>On-going (sub)urbanisation processes causing land use conflicts and urban environmental challenges</p>

	Strength	Weaknesses	Opportunities	Threats
		<p>of rivers and lakes in some regions (eutrophication)</p> <p>Lack of quality and quantity of environmental infrastructure in some regions (waste and water treatment)</p> <p>Deteriorating cultural heritage</p>	<p>ing clean drinking water supply, waste management and waste water treatment</p> <p>Growth potential of "green" economy</p>	
<p>TO 7</p> <p>Sustainable transport and key network infrastructures</p>	<p>High accessibility by rail around city hubs (nodes) and along corridors of high-speed rail lines</p> <p>Ongoing activities to promote sustainable transport</p> <p>High-speed projects in Southern Germany led to improved accessibility</p>	<p>Lack of integrated transport systems and multimodality especially in the new Member States</p> <p>Core-periphery disparities in accessibility:</p> <p>Core: regions of Germany, Austria and Northern Italy; periphery: the Eastern and Southern European regions</p> <p>Weak regional and local accessibility (railways, motorways and airports) especially outside of agglomeration areas and in the New Member States</p> <p>Low quality of public transport, decreasing share of public transport as well as missing road links and border-crossings in many peripheral regions</p> <p>Lack of accessibility of urban centres from some peripheral regions</p>	<p>On-going investments in connections of long-distance transport TEN-T networks/high potential multimodal accessibility in capital regions and in the western central Europe regions</p> <p>Increasing accessibility in Europe also strengthens accessibility of central European regions</p> <p>Economic development of industrialised areas is closely linked to the multimodal exchange of goods and efficient freight transport</p>	<p>Disparities in multimodal accessibility lower the competitiveness of regions</p> <p>Eastern countries are in a catching up process and motorized individual transport is on the rise</p>
<p>TO 8</p> <p>Employment and labour mobility</p>	<p>Economic migration across borders and high quality of cross-border labour markets</p> <p>Existing labour market cooperation</p>	<p>Strong economic disparities between regions in old and new MS</p> <p>Insufficient access to services and employment in regions dominated by small villages and sparsely populated areas</p> <p>High unemployment rate in eastern German</p>	<p>A more flexible labour market and support of alternative employment through EU legislation</p> <p>Exchange of knowledge and cultural values promoting a flexible creative workforce</p>	<p>Increasing (labour) market competition with other global regions (China, India, ...) and pressure on economic productivity</p> <p>Accelerating brain drain of young and creative talents from peripheral regions</p> <p>Decrease of em-</p>

	Strength	Weaknesses	Opportunities	Threats
		regions, border regions in the north-east of Hungary and Central-Eastern Slovakia Unidirectional workforce migration from new to old MS		ployment in the primary and secondary sector due to market transformation
TO 9 Social Inclusion and combating poverty	Diverse population, as e.g. ethnic diversity and presence of linguistic minorities Respect of gender equality Public interventions for the provision of equal opportunities	High polarisation in terms of income, education, health care, demographics, and employment Increasing gaps in quality and conditions of public services (east-west divide) Marginalisation of peripheral areas Risk of poverty for different population groups (e.g. women, migrants)	Equal opportunities as a horizontal theme in the programme life-cycle Promotion of social innovation can facilitate social inclusion	Ageing population Shrinking peripheral regions Increasing social diversity and polarisation
TO 10 Education, Skills and lifelong learning	Higher education levels leading to increased flexibility of people Increasing female education participation Employment growth through qualified and flexible workforce Highest share of population with tertiary education located around major cities	Education deficits in south-eastern regions Decrease in the proportion of the population with tertiary education in the old MS	Exchange of knowledge and cultural values promoting a flexible creative workforce Increase of knowledge and skills will contribute to respond to manage challenges such as those deriving from demographic change, migration and brain drain Maturity of European knowledge society (Bologna process; Student exchange programs)	Increasing competition between regions (labour market and population)
TO 11 Institutional capacity and efficient public administration	Connected top-down and bottom-up initiatives with the help of multi-level governance including e.g. participatory elements Tradition of inter-regional, transnational and cross-border cooperation on institutional, political and administrative level and within projects (e.g. strengthening of identities, economic cooperation, labour market migration)	Low levels of public e-administration Lack of a cross sectorial (integrated) approaches	Connectivity to macro-regional strategies such as the Baltic Sea Strategy, the Danube Strategy and forthcoming strategies Traditional administration accompanied by e-administration	Increasing gap between regulation and implementation; capacity needs (know-how, human resources) for administrations Over-regulation in some policy fields (e.g. national market protection, social security, labour markets)

5.2 Main Challenge and Needs

Table 5.2: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	Growth in business-related services, cross-sectorial and technology-oriented industries High expenses in R&D in urban regions, attractive labour markets for highly skilled workers	Low level of R&D in several (rural) regions Insufficient technology transfer and lack in the access to R&D-results especially for SMEs	Increasing accessibility in Europe also strengthens accessibility of central European regions Economic development of industrialised areas is closely linked to the multimodal exchange of goods and efficient freight transport	Brain drain of young and creative talents from peripheral regions Increasing (labour) market competition with other global regions (China, India) and pressure on economic productivity
Sustainable growth	Richness and diversity of landscape, natural and cultural heritage (important location factors)	High water dependency of some regions due to intensive agriculture or hydropower use New MS are more vulnerable to a significant climate change impact on summer tourism	Increasing awareness about climate change effects and adaptation measures Integrated management of natural and cultural resources contributes to sustainable long-term socio-economic development of regions	Increasing unsustainable use of environmental resources due to economic activities On-going (sub)urbanisation processes causing land use conflicts and urban environmental challenges
Inclusive growth	Higher education levels leading to increased flexibility of people Increasing female education participation Employment growth through qualified and flexible workforce	High polarisation in terms of income, education, health care, demographics, and employment Increasing gaps in quality and conditions of public services (east-west divide)	Equal opportunities as a horizontal theme in the programme lifecycle Promotion of social innovation can facilitate social inclusion	Ageing population Shrinking peripheral regions Increasing social diversity and polarisation

Strengths

The strengths of the programme area are in the area in the field of competitiveness and R&D advances is pronounced. Significant growth has occurred over the span of the programming period in the service sector and moderate to high value production chains. Especially urban centres act amplify this trend by attracting a large stock of highly-skilled individuals and increasing rates of female employment. These cities usually feature well-functioning and efficient public transportation (light and heavy rail) systems. Labour market flows are historically strong in the region, leading to cross-border cooperation and harmonisation of labour market regimes. ICT infrastructure is comparably well-built out, with significantly higher broadband connectivity rates in the accession states.

Weaknesses

Clear disparities can be observed within the programme area. Due to its size, it covers a territorially diverse area, with varying structural characteristics. The western regions in the programme area (primarily in Germany, Austria, Italy, Slovenia and Czechia) outperform their peers in terms of macro-economic performance. On the territorial level, other disparities can be observed: the highest share of population with tertiary education is generally located around major cities with increased marginalisation of rural and periphery areas. Labour exchange, while well-functioning, is unidirectional and oriented towards the West. The urban-rural split is also pronounced in terms of infrastructure and accessibility, with rural areas increasingly difficult to reach. This is further amplified in newer Member States, in which large infrastructure (rail, motorway) remains underdeveloped. Due to labour migration from rural areas, the coverage of services of general economic interest is low in parts of the programme area, further increasing migratory pressures.

Opportunities

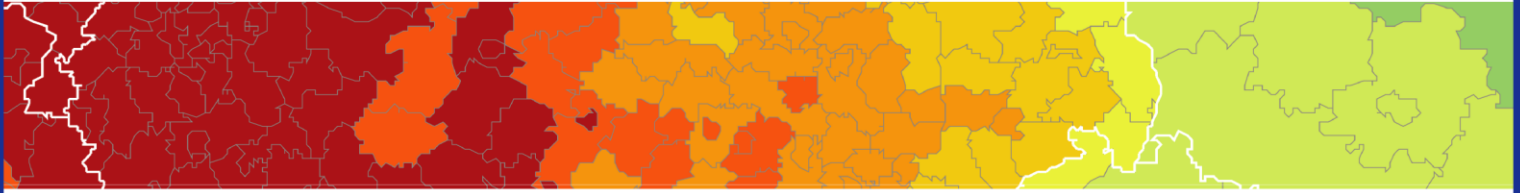
Economic migration across borders and the high quality of cross-border labour markets can be further built-upon by deepening existing forms of (cross-border) labour market cooperation. Further policy support for cooperative economic activities, development of clusters and networks can lend hand in making SMEs in the newer Member States of the programme area more competitive, where SMEs cooperate to a lower extent. Increasing accessibility in Europe also strengthens accessibility of Central European regions, which can be undertaken with the continuation of on-going investments in connections of long-distance transport TEN-T networks. There is potential high multimodal accessibility in capital regions and urbanised clusters in the western Central Europe regions.

Threats

The brain drain of young and creative talents from peripheral regions remains a consequence of the pronounced disparities between the programme area. As incomes rise and the regional economy develops (especially in less-developed regions in the programme area), regions face more pressure to shift to higher value segments of European production chains, as wage pressure from industrialising countries outside of the EU becomes stronger. Due to migratory pressures from eastern to western regions and urban centres, rural areas are becoming increasingly depopulated. The increased levels of urbanisation cause land use conflicts and urban environmental challenges.

References

Bürger et al. (2011) RES-H-Policy – Policy development for improving RES-H/C penetration in European Member States, IEE project.



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

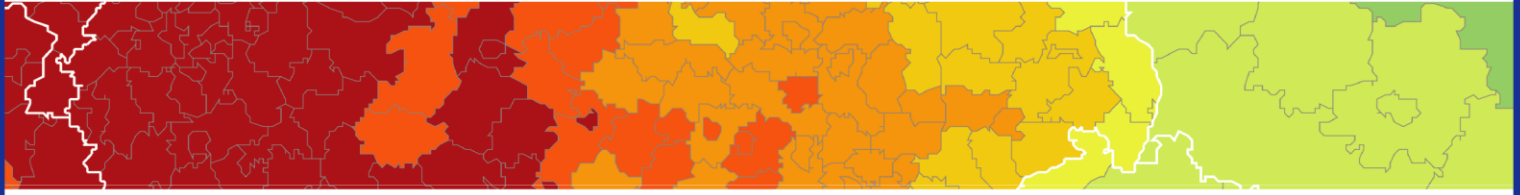
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG A Deutschland-Niederland

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG A Deutschland-Niederland

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview needs and challenges	3
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	4
3 Indicators	7
3.1 Initial result and output indicators used in assessment	7
3.2 Proposed Key Territorial Indicators.....	11
4 Benchmarking.....	15
4.1 Gross Value Added in Knowledge-Intensive Sectors	15
4.2 Innovation.....	18
4.3 Tourism and Sustainability.....	21
4.4 Regional Scoreboards.....	24
5 Reference Analysis	26
5.1 Territorial specificity of the programme area.....	26
5.1.1 Smart Growth	26
5.1.2 Sustainable Growth.....	28
5.1.3 Inclusive Growth	28
5.1.4 Main Challenge and Needs.....	28
References	30

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	7
Figure 4.1: Regional Scoreboard.....	24

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	14
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	14
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	17
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors	20
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	23

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.	11
Table 5.1: SWOT Analysis Smart Growth	26
Table 5.2: SWOT Analysis Sustainable Growth.....	28
Table 5.3: SWOT Analysis Overall Challenges and Needs	28

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

Geographical location & territorial characteristics: The programme area of the 2014-2020 Cooperation Programme INTERREG V A Germany-Netherlands is stretching along the roughly 460 km long North-South border between Germany and the Netherlands, from the North Sea coast to the Lower Rhine Valley. An analysis of its territorial characteristics has been carried out in 2012 to, among others, inform the programme in the 2014 – 2020 period (Buck Consultants International and MCON Consulting, 2012).

In 2012 the programme area had a population of about 14.3 million people, concentrated in the southern part of the area. By then population was estimated to grow with 1% until 2020. Population change was expected to differ across the area. Strongly shrinking areas were located in the rural North-East but also in few urbanized regions, e.g. around Duisburg. In 2010 there were around 760.000 businesses located in the area. Most of these (99%) were small and medium sized. In the same year there were a total of 5.396.572 jobs, relatively many in the sectors manufacturing and energy supply (16%) and public administration, public services and health (30%). In 2011 Southern and North-Eastern parts of the area had an, in respect to EU average, high percentage of unemployment. GDP in Dutch regions and regions around medium-sized German cities resembled or exceeded EU average. GDP in rural regions, particularly in Germany, were below average. There were a large number of ecologically valuable areas in the program area, with more than 100 NATURA 2000 territories.

Countries involved, budget, and funds: The programme area of the Cooperation Programme INTERREG V A Germany-Netherlands covers 51 NUTS 3 regions. 30 of these are located in Germany and 21 in the Netherlands. The total EU budget (excluding technical assistance) is € 417,659,598.00. In March 2018 funding of € 266,262,507 (including outstanding funding) has been allocated (Keep). All funds were provided via ERDF instruments.

2.2 Contribution to EU 2020 strategy & situation in the programme area

The overarching aims of the current programming period of the Cooperation Programme INTERREG V A Germany-Netherlands are embodied in the header “A new INTERREG-programme for a smart, sustainable and inclusive region” (Interreg Deutschland Nederland, 2015, p.4). A central mean to achieve this broadly defined agenda is in support for small and medium-sized businesses in specific sectors (Agribusiness/Food, Health & Life Sciences, High Tech Systems & Materials (HTSM), and Logistics). Support is intended to foster the formation of economic clusters that stretch across national boundaries. Strategic (business) initiatives are to simultaneously reduce CO₂ emissions and energy use and thus support the transition of energy systems towards a more efficient and sustainable use of natural resources. The strengthening of socio-cultural ties across the border and territorial cohesion are seen as prerequisites to achieve objectives.

More detailed contributions to the EU 2020 strategy are formulated from the perspective of countries, taking into account achievements already realized in 2011, during the earlier funding period of the programme (Interreg Deutschland Nederland, 2015, p.8).

- *Smart Growth*: Increase in the Gross Domestic Product (GDP) that is invested in education, research & development (Germany: 3%, Netherlands: 2.5%).
- *Sustainable Growth*: Reduction of greenhouse gas emission in respect to 2005 (Germany: 40%; Netherlands: 20%); Increase in energy consumption from renewable resources (Germany: 18%, Netherlands: 14%); Rise in energy efficiency (Netherlands: 16%, Germany: not specified).
- *Inclusive Growth*: Increase of population, age 20-64 years, with a job (Germany: 77%, Netherlands: 80%); Reduction of the amount of early school leavers (Germany: not specified; Netherlands: smaller than 8%); Increase of population, age 30-34 years, that has concluded tertiary education (Germany: 42%, Netherlands: larger than 45%); Reduction of the amount of people in the EU that are threatened by poverty of exclusion (Germany: 20% reduction of long-term unemployed, Netherlands: 100.000 fewer jobless households).

2.3 Overview needs and challenges

A strategic analysis of the programme area, titled *Strategic Analysis INTERREG V A-programme Germany-Netherlands 2014-2020*, has been carried out to inform the building of a common strategic framework for the 2014-2020 Cooperation Programme INTERREG V A Germany-Netherlands (Buck Consultants International and MCON Consulting, 2012). The analysis has considered conditions in the programme area, experiences from the earlier programme period, goals of single INTERREG partners and EU perspectives on the results of cross-border cooperation (smart, sustainable, and inclusive growth). The analysis is referred to in the cooperation programme document; distinct needs and challenges are emphasized by mentioning their importance for regional and national partners. In addition a collaborative approach that has led to a refined selection of economic sectors is described in the main document. The approach, *Smart Specialisation Strategies*, has focused attention on the sectors Agribusiness/Food, Health & Life Sciences, High Tech Systems & Materials (HTSM), and Logistics.

The below listed needs and challenges are adopted from the strategic analysis (Buck Consultants International and MCON Consulting, 2012, p. 25-36):

Smart Growth: A lack of innovation capacity in SMEs due to limited connection between knowledge institutes and the business community, low growth ambitions and limited competences within companies; Limited internationalization of SMEs; Restrictions in human capital, partly due to shrinkage and poor connection between education and the labour market, resulting in deficits on the one hand and unemployment and the brain drain of the higher educated on the other; Many practical obstacles to working and studying across borders.

Sustainable Growth: More efficient use of natural resources (via bio based and low-carbon economy); Part of the environmental problems (i.e. air and water pollution) play at the supra-

regional level/do not stop at borders; Conservation of biodiversity requires large, contiguous areas and cross-border nature development.

Inclusive Growth: Lack of exchange and joint activities (among others, aimed at young people and entrepreneurs); A lacking integration of the labour markets/a lack of qualified staff (both in growing and shrinking regions) and job opportunities; Current cross-border mobility is too limited to facilitate integration; Young people are not prepared for a cross-border labour market, in technical professions particularly; Cross-border mobility of students is impeded by bottlenecks in connection and recognition of certificates; A lack of cooperation between police and fire brigade to combat safety issues; Despite long-term efforts, cross-border language skills do not develop in the desired direction.

Integrated approach to territorial development: The cooperation programme document refers to an integrated approach to territorial development, via priority axes. The approach is deducted from the strategic analysis mentioned above (using the method of *Smart Specialisation Strategies*), experiences from the previous funding period, objectives in European Union and national strategies, objectives of the regional partners and results of stakeholder conferences and consultations. New integration instruments (ITI, CLLD) are not used.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1: More product and process innovations in the sectors that are relevant for the program area;

Priority Axis 1: Increasing the cross-border capacity for innovation (TO 1, IP 1b)

- *Brief justification:* A lack of innovation capacity and internationalization in SMEs; restrictions in human capital, partly due to shrinkage and poor connection between education and the labour market, obstacles to working and studying across borders.
- *Main change sought:* the number of product and process innovations has increased; the percentage of SMEs introducing product and/or process innovations has increased.
- *Expected activities:* The Cooperation Programme names four generic measures to achieve main change sought, notably (1) raising awareness and giving specific advice; (2) stimulating entrepreneurship; (3) the promotion of knowledge and technology transfer and open innovation and (4) the promotion of internationalization. Next to these generic measures, the document sets out a long list of activities related to the specific economic sectors under attention (Agribusiness/Food, Health & Life Sciences, High Tech Systems & Materials (HTSM), and Logistics).
- *Beneficiaries:* Technology, innovation and start-up centres; Companies (especially SMEs and their potential employees); Local and regional organizations and governments (for instance related to economic development, Chamber of Commerce, Chambers of Craft); Universities, colleges, research institutes and institutions supporting technology transfer; Educational institutions or other institutions that offer qualification programmes.

Specific objective 1: More product and process innovations in the field of CO₂-reducing technologies.

Priority Axis 1: Increasing the cross-border capacity for innovation (TO 4, IP 4f)

- *Brief justification:* use of natural resources is inefficient, environmental problems play at the supra-regional level, conservation of biodiversity requires large, contiguous areas and cross-border nature development.
- *Main change sought:* the number of product and process innovations in the field of CO₂ reduction has increased; The percentage of SMEs that introduce product and/or process innovations in the field of CO₂ reduction has increased;
- *Expected activities:* The Cooperation Programme lists 24 measures to achieve main change sought. In a brief summary these concern the stimulation of innovation in the field of CO₂ and energy-saving technologies through the exchange of knowledge and best practice, the creation of experimental settings (e.g. pilot projects), the building cross-border value chains and clusters (including companies, schools and knowledge institutes), the support to the building of new business models, the fostering of co-operation and the use of such technologies for a broad range of purposes (e.g. mobility, building, production).
- *Beneficiaries:* Technology, innovation and start-up centres; Companies (especially SMEs and their potential employees); Local and regional organizations and governments (for instance related to economic development, Chamber of Commerce, Chambers of Craft); Universities, colleges, research institutes and institutions supporting technology transfer; Educational institutions or other institutions that offer qualification programmes.

Specific objective 1: Reducing the barrier effect of the border for citizens and institutions.

Priority Axis 2: Socio-cultural and territorial cohesion (TO 11, IP: Promoting legal and administrative cooperation and cooperation between citizens and institutions (see VO (EU) No 1299/2013, Article 7 (1) (a) (iv);

- *Brief justification:* Lack of exchange and joint activities, lacking integration of the labour markets, insufficient cross-border mobility, young people are not prepared for a cross-border labour market, barriers to cross-border mobility of students, a lack of cooperation to combat safety issues, underdeveloped cross-border language skills.
- *Main change sought:* the attitude towards the neighbouring country has changed in a positive way; cross-border relations have been intensified; the inhabitants of the program area see the border as an opportunity rather than a barrier.
- *Expected activities:* The Cooperation Programme sets out measures in four thematic fields notably (1) working, education, culture, (2) nature, landscape and environment; (3) structure and demography and (4) network development at local and regional level. Each field is refined through a list of five to eight topics. Also these topics are broadly defined though. They include, for instance, accessibility, health services, natural and cultural heritage, social inclusion, tourism, and internal security.
- *Beneficiaries:* Citizens, associations; Regional and local organizations and governments (e.g. employers' and employees' organizations, insurers, social partners, cultural institutes and organizations, social institutes, municipalities); Nature and environmental organizations, nature park managers; Companies (especially SMEs and their potential employees); Hospitals, universities, research institutions, organizations in the field of health care; Employees, students, students, job seekers and trainees; Schools, universities and colleges, other educational institutes.

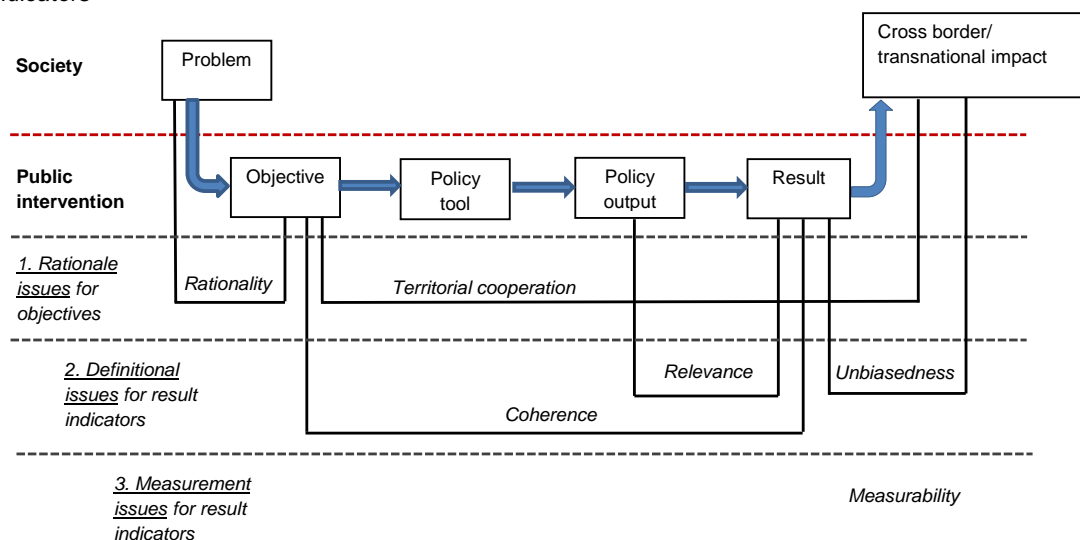
Programme coordination and synergies with the ESI Funds and other EU instruments: The 2014-2020 Cooperation Programme INTERREG V A Germany-Netherlands uses ERDF funding only. It mentions a broad range of other trajectories that can produce synergies and require coordination. These are the ERDF programs North, East and South Netherlands, Nordrhein-Westfalen and Niedersachsen, the Euregion INTERREG A programmes Meuse-Rhine and Flanders-Netherlands; the INTERREG B programmes North West Europe and North Sea, Horizon 2020, LIFE +, POP3, and ESF.

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
1	Increase in the product and process innovations in sectors relevant for the border region.	Share of SMEs implementing product or process innovations (Percentage)	HIGH	LOW - It is not evident how cross-border synergies will contribute to the achievement of the result	HIGH	HIGH	LOW - Several other factors are influencing the decision of firms to innovate (sector of specialization, human capital in the region, etc.)	HIGH
4	Increase in product and process innovations in the field of CO2 reduction and sustainable energy.	Share of SMEs implementing product or process innovations (Percentage)	HIGH	MEDIUM - Compared with the previous case, it is more evident the cross-border dimension (cross-border value-chains and clusters)	LOW - This specific objective concerns innovation in a narrow field (the environment and CO2 emissions), while the result indicator captures a more general propoensity to innovate	HIGH	LOW - Several other factors are influencing the decision of firms to innovate (sector of specialization, human capital in the region, etc.)	HIGH
11	Reducing the barrier effect of the border for citizens and institutions	Perception of the German-Dutch border as a barrier (Score)	HIGH	HIGH	HIGH	HIGH	LOW - Perception could be influenced by other factors not under the control of the policy makers (international frictions, other events, etc.)	MEDIUM - Survey data provide a good measurement but they are available at high costs

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

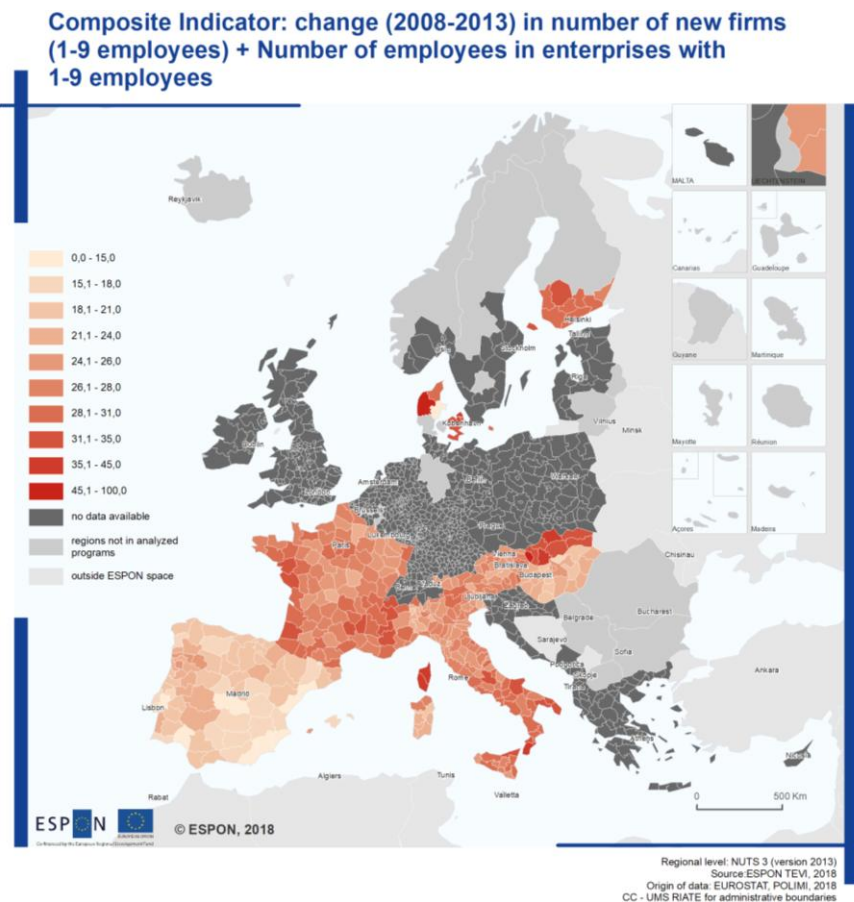
Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

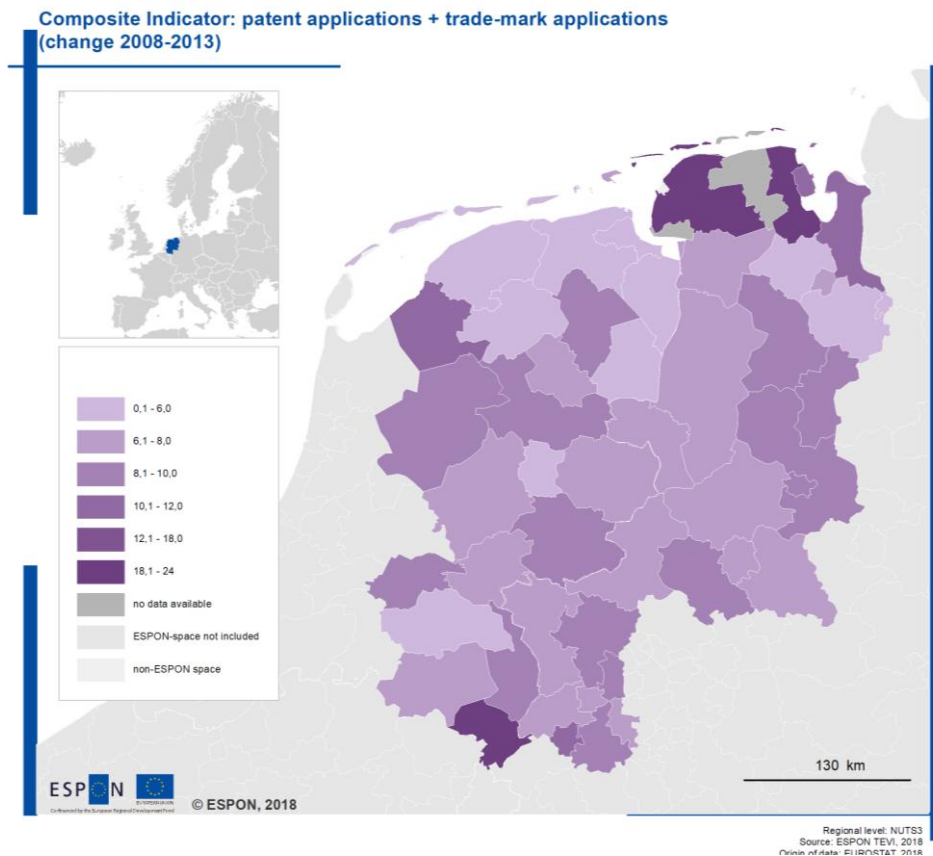
Going one step further from the assessment conducted under the table below and the short-listed result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Programme	Thematic objective	Specific objective	Output indicator	Result indicator	Proposed result indicator
DE-NL(1)	1	Increase in the product and process innovations in sectors relevant for the border region.	<p>O1 : Number of supported cross border innovation oriented cooperation activities (Number of measures)</p> <p>O2: Number of SMEs receiving support (Number of enterprises)</p> <p>O3: Percentage of SMEs that participated in innovation oriented INTERREG V projects and introduced product or process innovations (Percentage)</p> <p>CO1 1: Number of enterprises receiving support (Enterprises)</p> <p>CO1 2: Number of enterprises receiving grants (Enterprises)</p> <p>CO1 3: Number of enterprises receiving non-financial support (Enterprises)</p> <p>CO1 4: Private investment matching public support to enterprises (grants) (EUR)</p> <p>CO1 5: Private investment matching public support in innovation or R&D projects (EUR)</p> <p>CO1 6: Employment increase in supported enterprises (FTE)</p> <p>CO1 7: Number of new researchers in supported entities (FTE)</p> <p>CO1 8: Number of enterprises participating in cross-border, trans national or interregional research projects (Enterprises)</p> <p>CO1 9: Number of enterprises cooperating with research institutions (Enterprises)</p> <p>CO1 10: Number of research institutions participating in cross-border, transnational or interregional research projects (Organisations)</p> <p>CO1 11: Number of enterprises supported to introduce new to the market products (Enterprises)</p> <p>CO1 12: Number of enterprises supported to introduce new to the firm products (Enterprises)</p> <p>CO1 13: Number of participants in joint local employment initiatives and joint training (Persons)</p>	Share of SMEs implementing product or process innovations (Percentage)	Synthetic indicator: number of trademark application + numer of patent applications (by sector)
DE-NL(2)	4	Increase in product and process innovations in the field of CO2 reduction and sustainable energy.	<p>O1 : Number of supported cross border innovation oriented cooperation activities (Number of measures)</p> <p>O2: Number of SMEs receiving support (Number of enterprises)</p> <p>O3: Percentage of SMEs that participated in innovation oriented INTERREG V projects and introduced product or process innovations (Percentage)</p> <p>CO1 1: Number of enterprises receiving support (Enterprises)</p> <p>CO1 2: Number of enterprises receiving grants (Enterprises)</p> <p>CO1 3: Number of enterprises receiving non-financial support (Enterprises)</p> <p>CO1 4: Private investment matching public support to enterprises (grants) (EUR)</p> <p>CO1 5: Private investment matching public support in innovation or R&D projects (EUR)</p> <p>CO1 6: Employment increase in supported enterprises (FTE)</p> <p>CO1 7: Number of new researchers in supported entities (FTE)</p> <p>CO1 8: Number of enterprises participating in cross-border, transnational or interregional research projects (Enterprises)</p> <p>CO1 9: Number of enterprises cooperating with research institutions (Enterprises)</p> <p>CO1 10: Number of research institutions participating in cross-border, transnational or interregional research projects (Organisations)</p> <p>CO1 11: Number of enterprises supported to introduce new to the market products (Enterprises)</p> <p>CO1 12: Number of enterprises supported to introduce new to the firm products (Enterprises)</p> <p>CO1 13: Number of participants in joint local employment initiatives and joint training (Persons)</p>	Share of SMEs implementing product or process innovations (Percentage)	Synthetic indicator: number of trademark application + numer of patent applications (by theme)

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined timeperiod. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 0.6 can be observed, with corresponding maximum of 200. Maxima are found along urban centres, for example NUTS-3 regions around the Rhur, as well as bordering the region of Holland. These values fade considerably in the European context against best performing regions such as Madrid, Barcelona, Milano, Rome, Stockholm. In the context of the programme, Dutch regions have higher indicator values than German regions. Regions in the North on both sides of the border, and especially in North-eastern part of the German programme area have lower indicator values.

⁶nama_10r_3gva

⁷nama_10r_3empers

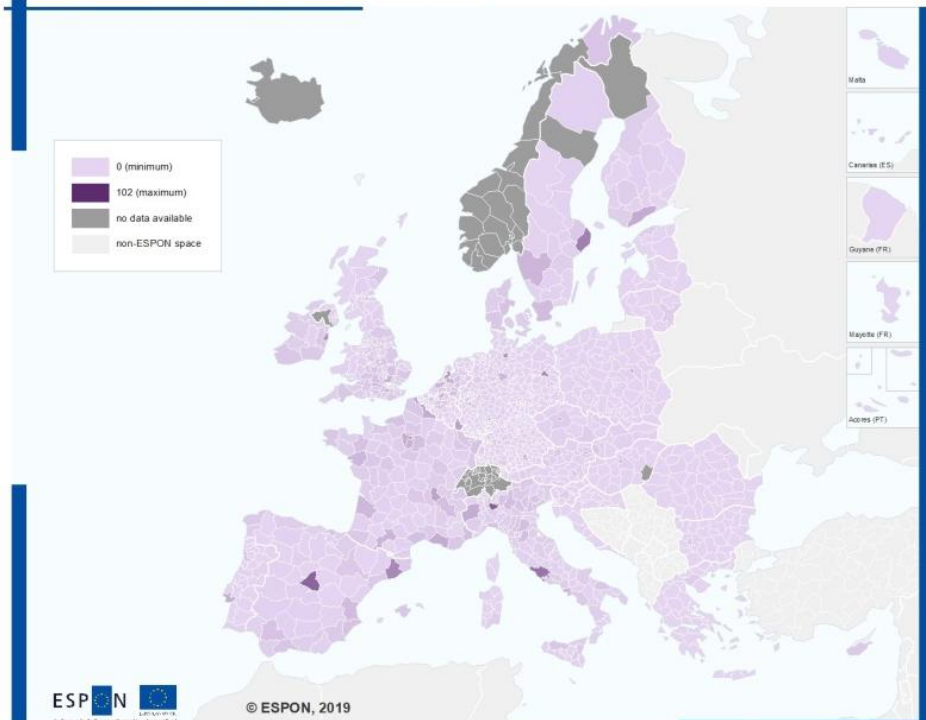
Increases in value added, in comparison with the European context, remain pronounced. Certain economically more successful sets of regions (for example Düsseldorf and East Netherlands) stand out in the European context. For the largest part, added value generation patterns follow European wide trends, with significant generation in urban centres and a limited degree of (generally urbanised) clusters. In the European context, added value growth has been relatively lower in North Netherlands and Lower Saxony.

The pattern of dispersion of value added generation in knowledge intensive sectors around Europe is primarily city-driven. Generally, urban centres generate sizeably more value added growth in knowledge intensive sectors, than rural and peri-urban regions. This is especially visible on the western and eastern flanks of the programme area, with region concentration in the metropolitan areas of Düsseldorf and Flevoland with its proximity to the Amsterdam-Rotterdam cluster. Surrounding areas generally feature relatively lower rates of growth, pointing towards the existence of hinterlands which primarily supply urban areas with labour, as opposed to housing knowledge intensive industries or services themselves. These urban-regional divides can be observed in Lower Saxony, with pronounced differences between Oldenburg and surrounding regions.

Another identified pattern is the existence of groups of regions with moderate to high growth in value added in knowledge intensive sectors. These are predominantly found in the Dutch regions of the programme area, especially on its western flank closer to the Amsterdam-Rotterdam cluster and in Northern Brabant. German regions perform significantly more heterogeneously in that regard, with more concentrated patterns along regional centre points.

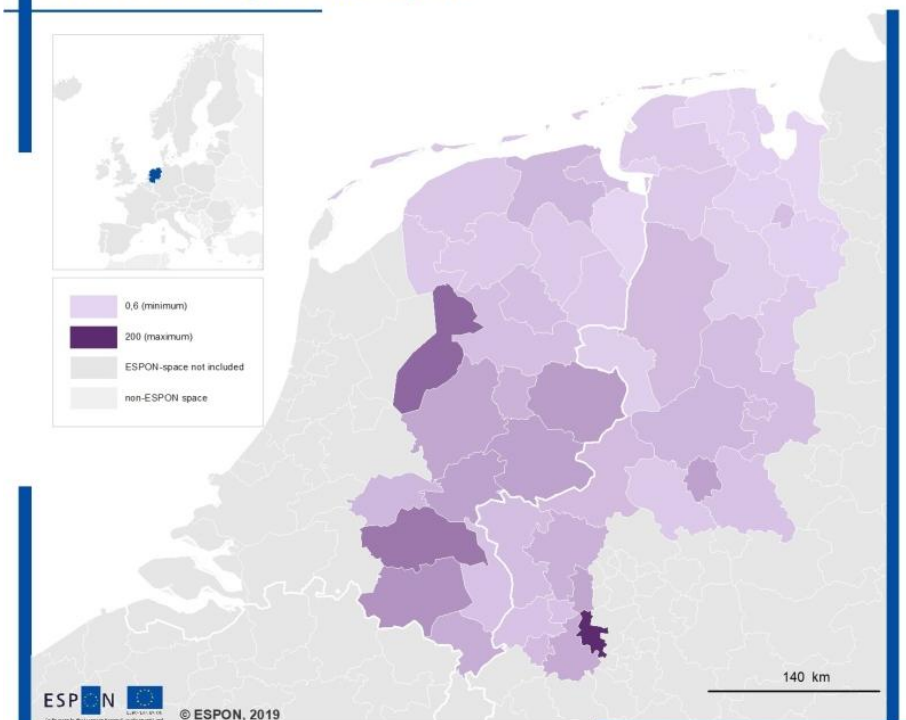
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR
 © UMS RIATE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR

4.2 Innovation

The maps below present the synthetic composite indicator *Innovation* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Innovation in the framework of the indicator is restricted to technical innovation via patent and trademark registration, thus not necessarily reflecting the status of social innovations. The composite indicator quantifies the innovation outputs undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework innovative economic activities. The indicator is calculated in the following manner:

$$Innovation = \frac{1}{2} * P_{i,t} + \frac{1}{2} * T_{i,t}$$

In which the variable $P_{i,t}$ represents normalised patent application values per NUTS-3 region to the European Patent Office in region i and at time t . Analogously, $T_{i,t}$ represents normalised trademark applications in a given region i and at time t . Thus, the indicator captures scientific and technical innovation, in addition to capturing process innovation via new products and similar by companies. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Trademark values on NUTS-3 level are obtained via the indicator European Union trade mark (EUTM) applications by NUTS 3 regions⁹.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of one can be observed, with corresponding maximum of 120.5. Minima are found in mostly rural areas in the North of the Netherlands and Germany. Maxima are found along urban centres, for example around Venlo and the greater Ruhr and generally in the South of the region, more than in the North of the region. Again as in the case above, the colours fade in the European context against strong performing regions (Madrid, Barcelona, Milano, South Burgenland, Stockholm, Blekinge and Kainuu). In the European context, the programme area is moderately-performing.

⁸ tgs00041

⁹ ipr_ta_reg

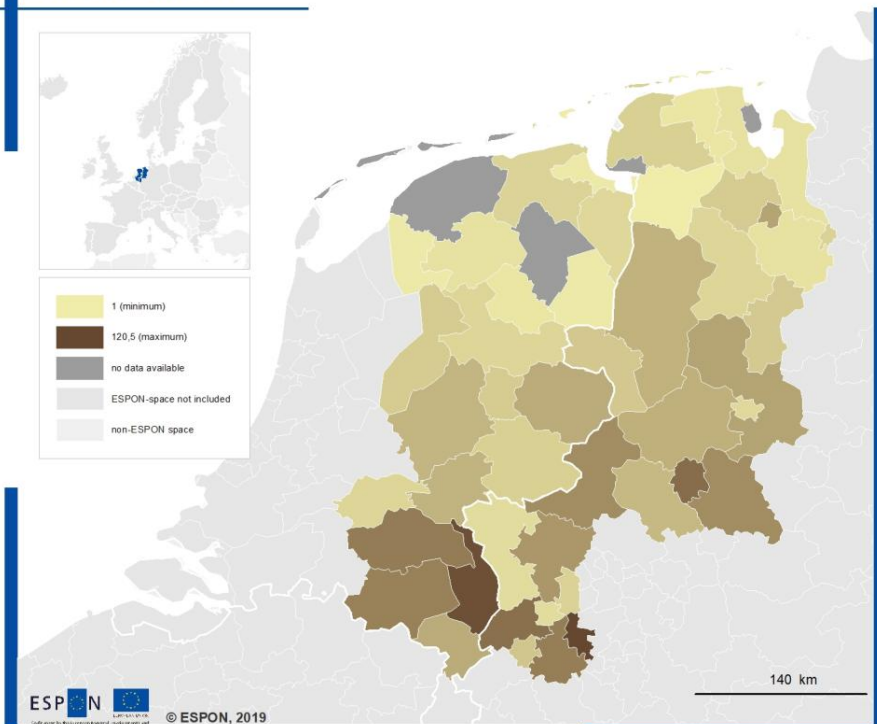
In the European context, innovation (measured by patent and trademark application) is concentrated along urban areas and clusters of R&D institutions. These regions tend to be relatively richly endowed in human capital with strong research institutions. Varying patterns can be identified. In some areas, a concentration of innovative activities to regional centres, generally capital cities, can be observed. This pattern is strongly observable on the Iberian peninsula with regional extrema in Madrid and Barcelona. Surrounding regions of these centres tend to feature a very low degree of innovative output. Another observable pattern are large clusters of regions, featuring moderate to high innovation output. These clusters generally rank in the mid-fields in terms of absolute indicator scores. Examples of these (sometimes large) clusters include Northern Italy (with a regional extrema in Milano and a surrounding cluster of moderately to well scoring regions), the Dutch region of Holland and Southern Germany.

In contrast with developments in gross value added, innovation output is distributed significantly more homogeneously across the programme area. Population centres in the southern regions of the programme area feature higher output. This is visible when contrasting North Brabant with much less densely populated regions in Lower Saxony. Regions characterised by strong economic output (such as Düsseldorf) perform significantly better than less strongly developed regions. Additional factors characterising regions with strong performance in the indicator is the existence of R&D sectors with strong interlinkages to the economy. This is the case for the regions of Düsseldorf and Venlo.

Urban centres with established universities also perform significantly better than their rural peers. This pattern can be observed in North Netherlands with Groningen performing marginally better than the surrounding regions. As an anomaly, Osnabrück performs marginally worse than surrounding regions, amplified by the pull of the significantly large city of Münster.

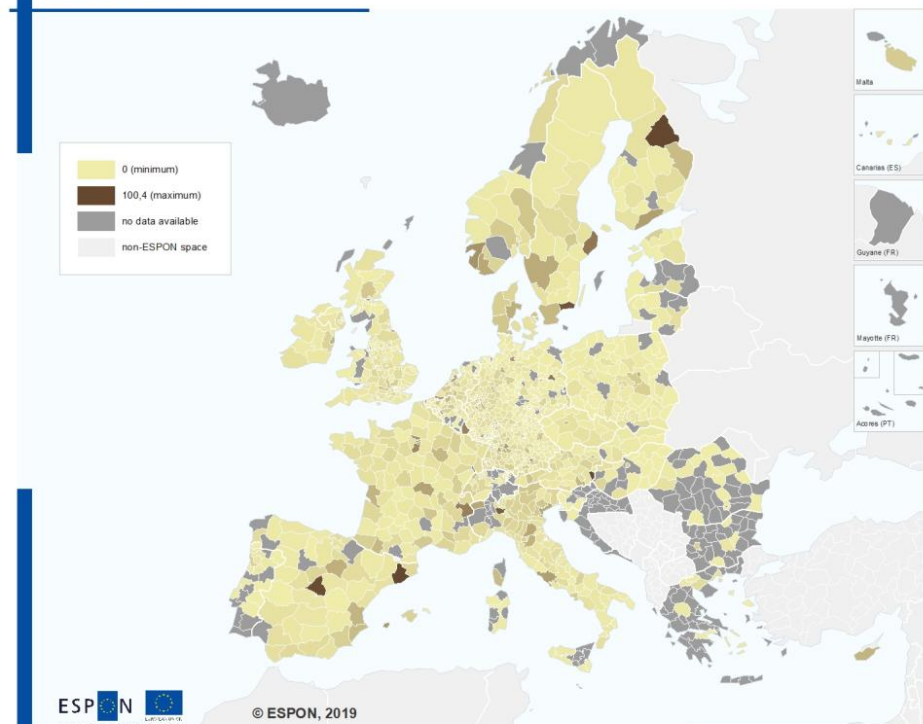
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Patelli, CIR

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Patelli, CIR
© UMS RIATE for administrative boundaries

4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies the developments in tourism and sustainability undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations and inverted. The indicator stems from Eurostat and is available in monthly intervals at national level¹⁰. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹¹ is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹². This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 0.6 can be observed with corresponding maximum of 105.3 Minima are found predominantly in relatively more urbanised regions. Maxima are distributed along in the North Seas coast.

As the indicator *sustainability* measures both increases in tourism, as well as its detrimental impacts (via potential changes to the environment, measured by the annual seasonality of tourism and changes in NATURA 2000 sites), a higher scoring region is not necessarily a

¹⁰ tour_occ_nim

¹¹ Source: EEA, DG REGIO

¹² tour_occ_anor2

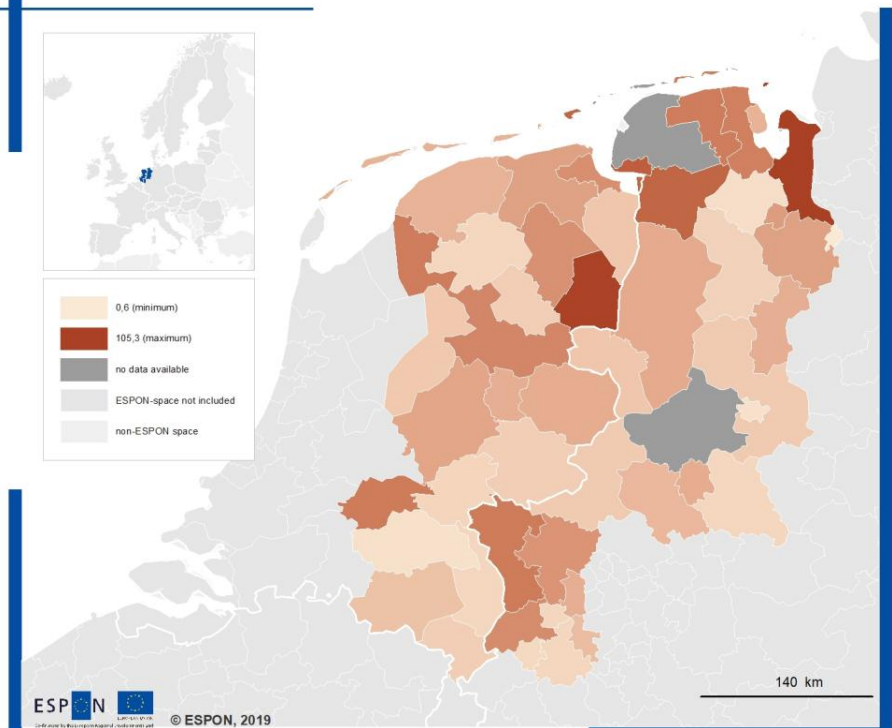
region which is attracting substantially more tourists, but may shine in other aspects (e.g. low seasonality of tourism). This can be observed in the maps below on European scale and across the programme area.

On European scale, several kinds of well performing regions can be identified: regions with predominantly low seasonality of tourism (e.g. regions within Belgium), regions with a large NATURA 2000 surface area in relation to their size (particularly Northern Sweden and Finland) and regions attracting a large degree of tourists (South-eastern Spain and Balearic Isles). Vice versa, there are also substantially many regions which may perform relatively well in one area (e.g. tourism), however, with a relatively low rating due to significant underperformance in other factors (e.g. concentrated seasonality around summer months). An example of this is Portugal. Most regions in the middle ground across Europe feature a combination of one of the factors outlined above with a relatively low rating in one of the other factors. An illustration of this phenomenon is Northern Italy, which boasts high popularity in terms of overnight stays, however, concentrated along summer months.

The programme region is characterised by a significant degree of heterogeneity. On the European scale, the programme area ranks in the lower midfield, largely thanks due to its low seasonality of tourism. Regions at the North Sea coast boast significantly higher rankings than the more densely populated areas in the South of the programme area. This can be observed in Friesland, Groningen and between Emden and Bremerhaven, generally due to a combination of relatively larger NATURA 2000 sites (e.g. in Aurich and Wesermarsch) and more tourists (Drenthe). Generally, Dutch regions tend to be characterised by a higher degree of overnight tourists than German regions in the programme area. However, German regions, also being less densely populated, feature significantly higher NATURA 2000 surface area.

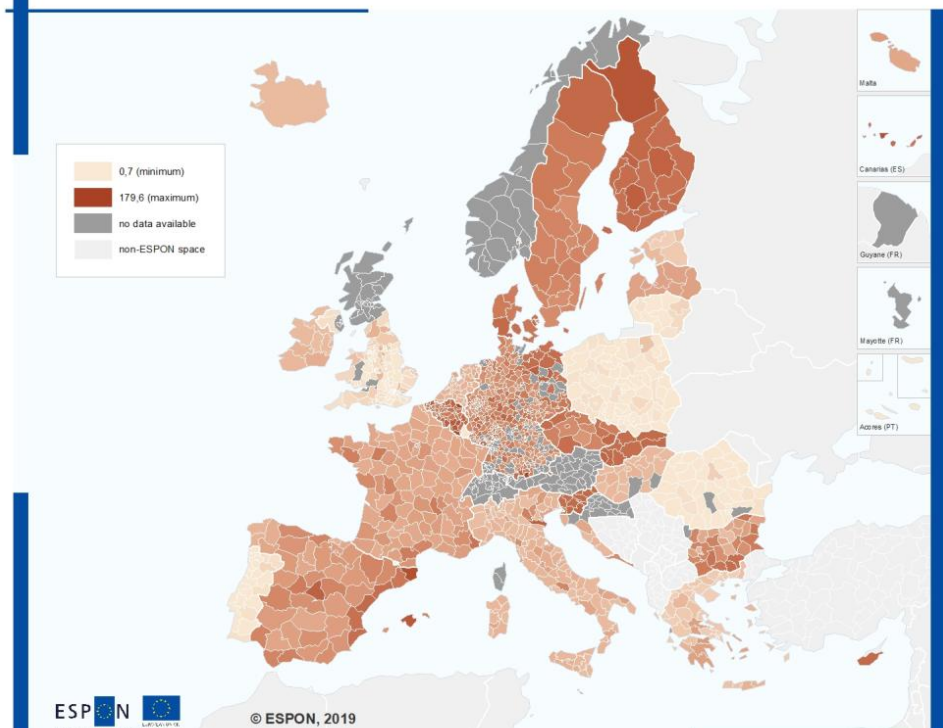
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, Polimi, CIR

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions

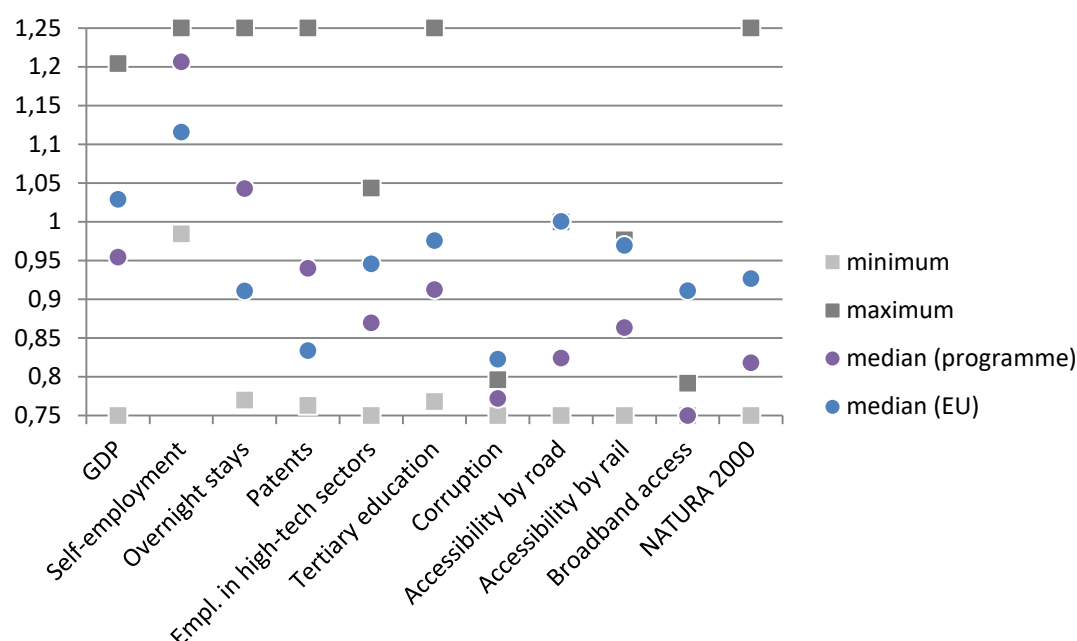


Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, Polimi, CIR
 © UMS RIATE for administrative boundaries

4.4 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The German-Netherlands Programme Area performs relatively well in lack of corruption, self-employment, and patent generation. A relative large range of values across the programme regions is observed across all presented indicators, indicating a certain degree of heterogeneity across the programme area, especially in terms of GDP, patent generation, overnight stays, and NATURA 2000 sites. Smaller differences can be observed in case of self-employment, employment in high-tech sectors and accessibility by road and rail. In some cases, the Programme Area is relatively cohesive, especially in the perception of lack of cor-

ruption or broadband access. In many cases the programme's median is below the EU median. Biggest differences are visible in accessibility by road, rail and broadband access as well as NATURA 2000 sites which are well below the EU median. The programme median outperforms the EU median in case of self-employment, overnight stays and patents.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

Smart Growth	Strength	Weakness	Opportunity	Threat
Agribusiness/Food	<p>Large part of the value chain in the region</p> <p>Considerable knowledge base and strong connection between research and practice</p> <p>Favourable location in relation to sales areas and strong agrologistics</p>	<p>Especially on the German side, many SMEs</p> <p>Due to low margins, companies in a number of sub-sectors have little capital or borrowing capacity for innovative investments</p>	<p>Precision agriculture with the aid of sensors and robots</p> <p>Creation of higher added value from product components</p> <p>New growth markets such as special foods and production/processing systems</p> <p>More efficient use of resources (more with less)</p> <p>Replacement of fossil fuels with renewable, biobased alternatives</p> <p>Paradigm shift to organic farming, more transparency and animal health</p>	<p>Reduction of EU production surcharges so that agricultural entrepreneurs have to work more demand instead of supply-oriented</p> <p>Increasing competition from other production countries (including Eastern Europe)</p> <p>Higher consumer demands for taste, health, environmental effects and animal welfare</p> <p>Major economic consequences due to crises such as food scandals and animal diseases</p> <p>Increasing acceptance problems among the population</p> <p>Availability of adequate personnel (including image) and business successors</p>
Energy	<p>Long tradition and many competencies</p> <p>Initiatives in many areas</p> <p>Boosting capacity at cluster organizations and development companies</p> <p>Brand name/branding of program area as energy region</p> <p>High R & D competencies with international connections</p> <p>Large system competencies</p>	<p>Fragmentation of networks</p> <p>Changing government policy in the Netherlands with a strong focus on fossil energy</p> <p>Different systems in Germany and the Netherlands</p>	<p>Decentralized energy generation</p> <p>Greening of gas via hubs</p> <p>Large-scale offshore wind farms</p> <p>Government policy aimed at higher share of sustainable energy and savings (CO₂ reduction)</p> <p>Knowledge exchange/lessons from different approaches on both sides of the border</p> <p>Energiewende in Germany</p> <p>Further cross-linking with key technologies</p>	<p>Resistance of established parties, both energy groups and the population against, for example, decentralized generation, large-scale wind energy and biomass</p> <p>Constraining regulations in terms of RO, use of biomass and balancing supply and demand</p> <p>Long-term reliability of energy policy, for example uncertainty about offshore wind</p> <p>Shortage of skilled workers</p>
Health & Life Sciences	<p>Extensive health infrastructure of good quality</p>	<p>Limited connection between health care systems on</p>	<p>Strongly increased life expectancy and increasing aging</p>	<p>Contraction of the population in parts of the program</p>

Smart Growth	Strength	Weakness	Opportunity	Threat
	<p>Extensive knowledge base at health care institutions, companies and research institutes</p> <p>Various networks to boost care innovations</p> <p>Experiences with cross-border cooperation</p>	<p>both sides of the border, inter alia in terms of financing</p> <p>Limited presence of large pharmaceutical and med-tech companies</p>	<p>Extramuralisation of care (living longer at home) requires new service concepts</p> <p>Empowered citizens shop more for care, among other things on the other side of the border</p> <p>Numerous new technologies offer applications in healthcare</p> <p>Increasing attention for infectious diseases, including from patient to patient and from animal to human</p>	<p>area, as a result of which the support level for care facilities is decreasing</p> <p>Need for cost control and savings in healthcare</p> <p>Limited possibilities for growth in the labor productivity of health personnel, which in the long term threaten to short-falls</p>
Logistics	<p>Favorable location as a gateway to Northwest Europe</p> <p>Access to the North Sea via ports</p> <p>Extensive infrastructure networks</p> <p>Presence numerous transfer points and logistics service providers</p>	<p>Number of gaps in cross-border connections</p> <p>Sub-optimal connection of cross-border rail traffic</p> <p>Restrictions in cross-border public transport, partly due to limited support</p>	<p>Transit to markets located further afield in Eastern and Southern Europe and vice versa</p> <p>Application of new logistic (including multimodal) concepts, partly based on ICT</p> <p>Stimulating more environmentally friendly transport</p>	<p>Competition from low-cost providers from other countries</p> <p>Congestion on certain connections (temporarily less due to economic crisis)</p> <p>Low margins limit the possibilities of companies to invest in innovations</p> <p>Safety and development of waterways</p>
High Tech Systems & Material (HTSM)	<p>High-quality R & D infrastructure at companies and research institutions •</p> <p>Strong organization degree in specific niches •</p> <p>Brand name of German manufacturing industry and Brainport High Tech</p>	<p>Competitive position of certain niches (among others automotive) under pressure</p> <p>Difficult access for SMEs/new entrants due to capital-intensive nature</p>	<p>Cross-sectoral application possibilities, including in energy and environmental technology, maritime sector, health care, etc.</p> <p>Large societal challenges require technological solutions that the industry can deliver</p> <p>Different structures and cultures on both sides of the border can lead to innovative applications and solutions</p> <p>Increasing investments in knowledge-intensive sectors</p> <p>Better R & D utilization through cooperation between companies and knowledge institutes stimulated by cluster and network building in recent years</p>	<p>Home market in Europe is only growing</p> <p>Relocation of R & D towards emerging markets</p> <p>Shortages in technical staff (NL)</p> <p>Little R & D from SMEs in rural areas.</p>

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strength	Weakness	Opportunity	Threat
Sustainable Growth	<p>Large base for agricultural and chemical companies</p> <p>Parties and networks that want to start using bio-economy</p> <p>Supply options, for example via the Northern ports of biomass from Northern and Eastern Europe</p>	<p>Domain is still in pioneering phase with little focus and a lot of fragmentation</p> <p>Networks of parties are still under construction</p> <p>Many initiatives are still in a pilot phase, with hardly successful earnings models</p> <p>R & D still needs to be expanded</p>	<p>New revenue models for the agricultural sector and cost savings for chemistry</p> <p>Construction of the whole chain from supply to sales</p> <p>Stimulating policy of EU and national governments</p>	<p>Supply and demand of different types of biomass do not match each other</p> <p>Fragmentation and competition between initiatives</p> <p>Legislation and regulations sometimes still limit the use of biomaterials</p> <p>Negative environmental consequences of the supply of biomass over a large distance</p> <p>Land use conflicts in situations of scarce land</p>

5.1.3 Inclusive Growth

Information on contribution to Inclusive Growth has been accounted for in Smart and Sustainable Growth.

5.1.4 Main Challenge and Needs

Table 5.3: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	<p>Large part of the value chain in the region (agrisector)</p> <p>Favourable location in relation to sales areas and strong agrologistics</p> <p>Brand name of German manufacturing industry and Brainport High Tech</p>	<p>Restrictions in cross-border public transport, partly due to limited support</p> <p>Competitive position of certain niches (among others automotive) under pressure</p> <p>Difficult access for SMEs/new entrants due to capital-intensive nature</p>	<p>Better R & D utilisation through cooperation between companies and knowledge institutes stimulated by cluster and network building in recent years</p> <p>Government policy aimed at higher share of sustainable energy and savings (CO₂ reduction)</p>	<p>Relocation of R & D towards emerging markets</p> <p>Shortages in technical staff (NL)</p> <p>Safety and development of waterways</p>
Sustainable growth	<p>Supply options, for example via the Northern ports of biomass from Northern and Eastern Europe</p> <p>Political acceptance for biomass and renewables</p>	<p>High tech agri-domain is still in pioneering phase with little focus and a lot of fragmentation</p>	<p>New revenue models for the agricultural sector and cost savings for chemistry</p>	<p>Legislation and regulations sometimes still limit the use of biomaterials</p> <p>Negative environmental consequences of the supply of biomass over a large distance</p> <p>Land use conflicts in situations of scarce land</p>

Strengths

The programme area features a strongly developed and productive economy. Especially agribusinesses are prominent in the programme region. Large part of the value chain of the agribusiness sector remains in the region, enhancing local synergies and ties to other sectors (agrologistics). Manufacturing companies are well-established, particularly in the German regions. Brand name of German manufacturing industry eases export market access. Supply options remain well-functioning due to high accessibility of the programme area, for example via the Northern ports of biomass from Northern and Eastern Europe

Weaknesses

Cross-border mobility (especially in terms of public transport) remains underdeveloped in comparison to other intra-country public transport, partly due to limited political support. This hampers cross-border commuting and incentivises the use of private cars. The competitive position of certain niches (among others automotive) is under pressure from a variety of factors (weakening export markets, political and social pressure). The high degree of export orientation of the programme area increases its vulnerability of macro-economic shocks and trade conflicts, as the local markets are not sizeable enough to absorb additional capacity. Due to the capital intensive nature of production, new entrants (SMEs) find it difficult to access the market, reducing the diversity of companies.

Opportunities

Better R & D utilisation through cooperation between companies and knowledge institutes stimulated by cluster and network building in recent years can lead to increased product diversification and knowledge transfer. In addition to ensuring medium term economic viability of companies, it also improves the overall economic resilience of the programme area. Renewable energy sources are growing in importance in the energy mix of the regions in the programme area. Government policy complements consumer preferences by aiming at higher share of sustainable energy and savings and CO₂ reductions.

Threats

Shortages of skilled personnel is also affecting high-tech sector and particularly R&D. The relocation of R & D towards emerging and export markets is tied to the observed skills shortage and high standards of living. With the relocation of R&D divisions, the R&D capacity of the programme area is weakened. Due to the export orientation of local enterprises, the safety and development of waterways is essential. Disruption, due to disrepair or low water levels, can create significant problems in the transport of large volumes of goods to export harbours. The dense population of the programme area (particularly in the Dutch regions) poses significant environmental challenges, as well as stoking land-use conflicts.

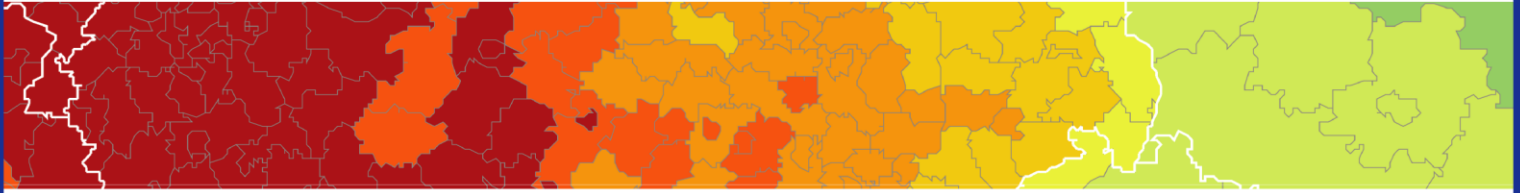
References

Bürger et al. (2011) RES-H-Policy – Policy development for improving RES-H/C penetration in European Member States, IEE project.

BUCK CONSULTANTS INTERNATIONAL & MCON CONSULTING 2012. Strategische analyse INTERREG V A-programma Duitsland-Nederland 2014-2020 – Concept 2. Nijmegen/Oldenburg: Buck Consultants International/MCON Consulting.

EACR IMPACT & RADBOUD UNIVERSITY 2015. Nullmessung des Ergebnisindikators der Priorität 2: „Wahrnehmung der deutsch-niederländischen Grenze als Barriere“.

INTERREG DEUTSCHLAND NEDERLAND 2015. Interreg Deutschland Nederland. Samenwerking-programma 2014-2020, Versie 2.1, 30-11-2015.



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

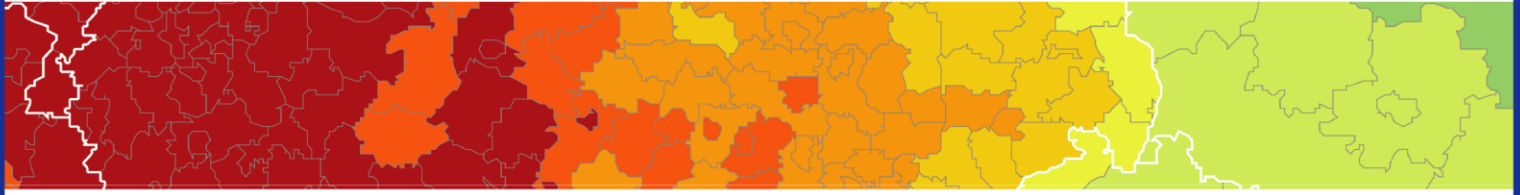
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG A Italy-Austria

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG A Italy-Austria

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview needs and challenges	3
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	4
2.5 Indicators selected in the Programme: Initial assessment.....	5
3 Indicators	6
3.1 Initial result and output indicators used in assessment	6
3.2 Proposed Key Territorial Indicators.....	10
4 Benchmarking.....	13
4.1 Gross Value Added in Knowledge-Intensive Sectors	13
4.2 Innovation.....	16
4.3 Regional Scoreboards.....	19
5 Reference Analysis	21
5.1 Territorial specificity of the programme area.....	21
5.1.1 Smart Growth	21
5.1.2 Sustainable Growth.....	21
5.1.3 Inclusive Growth	22
5.1.4 Main Challenge and Needs.....	22
References	25

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	6
Figure 4.1: Regional Scoreboard.....	19

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	12
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	12
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	15
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors	18

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.....	10
Table 5.1: SWOT Analysis Smart Growth	21
Table 5.2: SWOT Analysis Sustainable Growth.....	21
Table 5.3: SWOT Analysis Inclusive Growth.....	22
Table 5.4: SWOT Analysis Overall Challenges and Needs	22

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

The Programme involves eleven NUTS3 regions in Austria and eight NUTS3 areas in Italy. The area covered by the Programme spreads over 54.065 km² and the population involved was equal to 5.681.950 inhabitants in 2017. About 65% of the population is resident in Italy. The eligible area covers mountain territories in the Alps and, as consequence, population density is lower than the country average for both Italian (153 vs. 200.6 inhabitants per km²) and Austrian regions (66 vs. 105.8 inhabitants per km²).

The per capita GDP in Italian eligible areas is significantly higher than the national value (€ 32,220 vs. € 27,200 per inhabitant in 2015). The Austrian Programme area, instead, is characterized by a level of GDP per capita comparable with the whole country (€ 39,376 vs. € 39,900 per inhabitant in 2015).

The economic specialization of the Italian eligible regions was, in 2015, more oriented than the country average towards manufacturing (24.6% vs. 16.0% of value added). On the other hand, the specialization the service sector was lower, especially as far as ICT wholesale and retail trade (21.6% vs. 24.2% of value added) and financial, professional, scientific and technical activities are concerned (26.0% vs. 29.2% of value added). The Austrian Programme area is a characterized by an economic specialization similar to the national one, with the exception of a higher share of value added generated by wholesale and retail trade, transport and ICT (31.4% vs. 26.8%) and a lower presence of financial, professional, scientific and technical activities (20.5% vs. 23.6% of value added).

The total budget of the OP amounts to € 98,380,352, and the EU contribution, via ERDF, is equal to 82,238,866.

2.2 Contribution to EU 2020 strategy & situation in the programme area

The main programme objective for the 2014-20 programming period is to reinforce cross-border cooperation between Austrian and Italian neighbouring regions. Overcoming national barriers and the creation of new synergies between the two countries will contribute to all the three EU 2020 strategy pillars.

The *Smart Growth* strategy will be addressed by the Programme through the development and reinforcement of cross-border cooperation, in the aim of stimulating the development of firms' networks, especially in the economic sectors with a higher development potential such as the those of research and innovation.

Sustainable Growth is an extremely important element for the Programme area, characterized by a rich natural and cultural environment. This characteristic represents a huge potential for tourism attraction, especially in the Alpine areas. At the same time, however, it implies some risks, related to the sustainable preservation of these resources. In this perspective, the rein-

forcement of cross-border cooperation will focus on joint actions for the protection of biodiversity and the variety of species. Tourism facilities will be made more accessible through the reinforcement of cross-border traffic interoperability and a better coordination of transport operators.

Population ageing and the difficulties of the young generations in the access to the job market call for interventions in the strategy pillar of *Inclusive Growth*. In this case, the cross-border cooperation will provide incentives for professional cross-border mobility, jointly with common actions and strategies in the job-placement activities.

2.3 Overview needs and challenges

The needs and challenges of the Programme area highly depend on the territorial characteristics of the regions involved.

The presence of a number of high-quality universities and research centres represents a potential for the launch of joint projects, especially in those sectors where Italian and Austrian eligible regions share the same specialization (culture, medicine and health, tourism, agri-food, energy). Public intervention is needed since, until now, existing cooperation networks were not able to guarantee stable, long-period interactions among partners.

The impact of the global economic recession involved, with a different intensity, also the regions of the Programme area, and in particular the Italian ones. Cross-border cooperation in R&I is a potential for launching firms' competitiveness and productivity.

The challenge for the achievement of a sustainable growth is related to the increasing demand, both at the local and EU level, of renewable energies. The sustainable exploitation of the natural resources of the Programme area, especially in terms of water, is the instrument through which new modes of management of the territory and its potential will be developed, based on cross-border agreements and strategies.

Finally, inclusive growth actions will be aimed at the achievement of a higher involvement of young generations in the job market by exploiting some opportunities provided by the socio-economic environment of the Programme area. On the one hand, SME and artisans are the keepers of knowledge and traditions, whose transmission to the younger generations will be incentivized by Programme actions. On the other hand, the high entrepreneurial propensity of the eligible regions will be further stimulated, in order to facilitate the creation of new businesses.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1: Strengthening research capacities and innovation capacities through the cross-border cooperation of research facilities

Priority Axis 1: Research and innovation (TO1, IP 1a)

- *Brief justification:* the area is characterized by several high-quality research institutions, which found difficulties in the creation of stable cooperations.
- *Main change sought:* reinforcement of research and innovation in the key sectors of regional economies through cross border cooperation of research institutes.
- *Expected activities:* identification of possible synergies for the cross border cooperation of research institutes and universities, shared investments on research infrastructures.
- *Beneficiaries:* public authorities, research centres, Universities, Technical schools, research cluster, technological and innovation parks, Chambers of Trade.

Specific objective 2: Promote investment in R&I by strengthening cross-border cooperation between companies and research institutions

Priority Axis 1: Research and innovation (TO1, IP 1b)

- *Brief justification:* the economic crisis resulted in a slowdown of the regional economies of the area (especially in Italy), cross-border cooperation on R&I is a potential for launching economic growth.
- *Main change sought:* reinforcement of the cross border cooperation among firms and research centres.
- *Expected activities:* measures for the technological transfer between firms and research and innovation institutions, incentives for the development of networks and cluster.
- *Beneficiaries:* public authorities, research centres, Universities, Technical schools, research cluster, technological and innovation parks, firms, association categories, innovation intermediaries.

Specific objective 3: Improving the innovation base for companies in the program area.

Priority Axis 1: Research and innovation (TO1, IP 1b)

- *Brief justification:*
- *Main change sought:* selected for similar reasons as SO2.
- *Expected activities:* support to firms in the early phase of innovation creation, promotion of the SMEs growth and development.
- *Beneficiaries:* public authorities, research centres, Universities, Technical schools, research cluster, technological and innovation parks, firms, association categories, innovation intermediaries.

Specific objective 4: Protection and promotion of natural and cultural heritage

Priority Axis 2: Nature and culture (TO6, IP 6c)

- *Brief justification:* natural and cultural heritage represent a resource for the area, especially for tourism attraction.
- *Main change sought:* Valorisation of the cultural and natural heritage.
- *Expected activities:* improvement of biodiversity, actions for the protection and preservation of the cultural and natural heritage.
- *Beneficiaries:* public authorities, Universities, associations, cultural organizations, environmental authorities, SMEs, tourism organizations.

Specific objective 5: Strengthening cross-border institutional cooperation in the central areas of the program area

Priority Axis 3: Institutions (TO11, IP 11CTE)

- *Brief justification:* the lack of integration between cross-border institutions generates costs for firms and citizens.
- *Main change sought:* increasing the cooperation between cross-border institutions and improving the integration of administrative rules and norms.
- *Expected activities:* planning and provision of joint services from the cross border institutions, harmonization of the existing regulations.
- *Beneficiaries:* public administrations.

Specific objective 6: Promotion of integration and of local ownership in its immediate frontier zone with integrated cross-border strategies in accordance with the CLLD approach

Priority Axis 4: Regional development at the local level (TO9, IP 9d)

- *Brief justification:* the reduction of cross-border barriers calls for a stronger involvement of local communities, and their daily collaboration and social and cultural exchange.
- *Main change sought:* increase the participation of citizens from local communities in co-operation activities, adopting a bottom-up approach.
- *Expected activities:* realization of small-scale projects, aimed at the diversification of the local economy in the cross border areas.
- *Beneficiaries:* local action groups.

Synergies with other EU interventions: The programme presents several possible synergies with other EU Instruments. More specifically, the whole Programme area is included in the EU strategy for the Alpine region (EUSALP), while Austrian and Italian eligible regions take part respectively of the EU Strategy for the Danube Region (EUSDR) and EU Strategy for the Adriatic-Ionian Region (EUSAIR). Moreover, actions in the priority axis 1, Research and innovation, will look for possible synergies with Horizon 2020.

2.5 Indicators selected in the Programme: Initial assessment

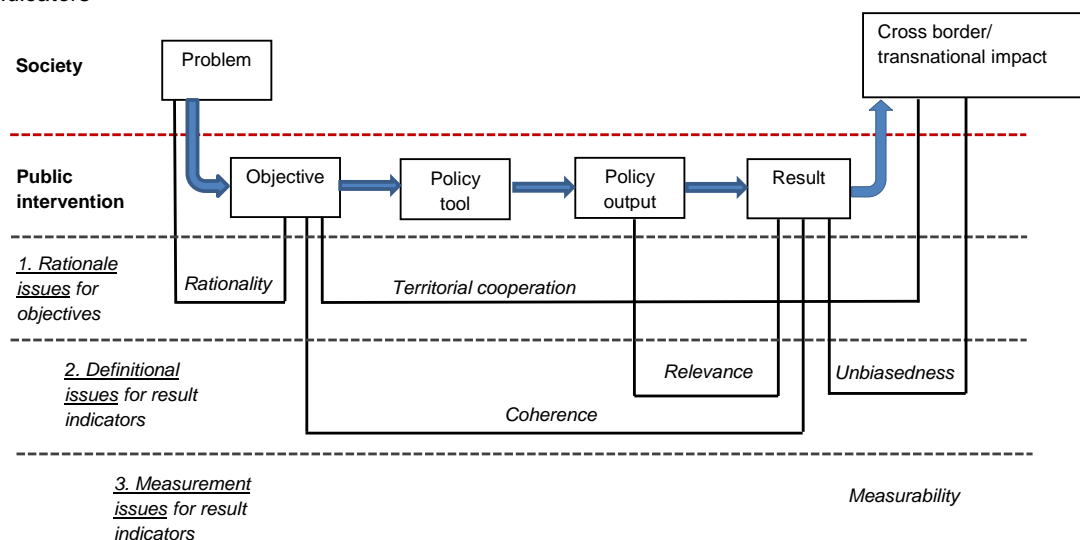
Output and result indicators have been defined for all the priority axes of the Programme. Each axis is assessed with one result indicator, with the exception of the priority axis on Research and innovation, for which three result indicators were defined. Whenever possible, result indicators are quantitative and derived from official statistical sources.

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Programme	Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
Italy-Austria (1)	1	Strengthening research capacities and innovation capacities through the cross-border cooperation of research facilities	Share of cross-border active researchers at research institutions in the program area (Number of researchers in transnational R & D projects / Number of total researchers (%))	HIGH	HIGH	HIGH	MEDIUM - The share of researcher could capture an outcome of the Programme (R&D projects financed)	HIGH	MEDIUM - Since official statistics on this result indicator are poorly available for other regions, comparability is limited
Italy-Austria (2)	1	Promote investment in R&I by strengthening cross-border cooperation between companies and research institutions	Number of companies participating in cross-border networks and innovation clusters (Number of companies that are active in networks and innovation clusters)	HIGH	HIGH	HIGH	LOW - The result indicator is measuring an outcome rather than a result	HIGH	LOW - Comparability with other areas is low and the number of firms should be weighted to take into consideration the whole population
Italy-Austria (3)	1	Improving the innovation base for companies in the program area	R & D expenditure in the business sector in% of GDP (percent)	HIGH	MEDIUM - Compared with objective (2), with a strong focus on cross-border synergies, here this aspect is less evident	HIGH	HIGH	LOW - Exogenous factors outside the control of the Programme, such as the effect of competition, must be considered	HIGH
Italy-Austria (4)	6	Protection and promotion of natural and cultural heritage	Number of arrivals in the program area (Arrivals)	MEDIUM - Protection and promotion of natural and cultural heritage could be hard to be simultaneously achieved	MEDIUM - How can territorial synergies contribute to the objective in the whole area, avoiding competition effects between different localities?	LOW - An increase in tourism could generate effects opposite to the desired ones. It captures promotion but not protection	HIGH	LOW - Tourism flows could depend on changes in the competitors' behaviour, contingent exogenous factors (e.g. adverse weather conditions)	HIGH
Italy-Austria (5)	11	Strengthening cross-border institutional cooperation in the central areas of the program area	Improving institutional cooperation in the program area (Degree of cooperation (sentiment index))	HIGH	HIGH	HIGH	HIGH	HIGH	MEDIUM - Survey data are costly to be collected and they do not allow for any comparison with other areas
Italy-Austria (6)	9	Promotion of integration and of local ownership in its immediate frontier zone with integrated cross-border strategies in accordance with the CLLD approach	Participation of civil society actors on the cross-border development strategies (CLLD) (number of players)	HIGH	HIGH	HIGH	LOW - The result indicator is measuring an outcome rather than a result	HIGH	LOW - It is not clear how the stakeholders involved are counted. Poor comparability with other areas.

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key social challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

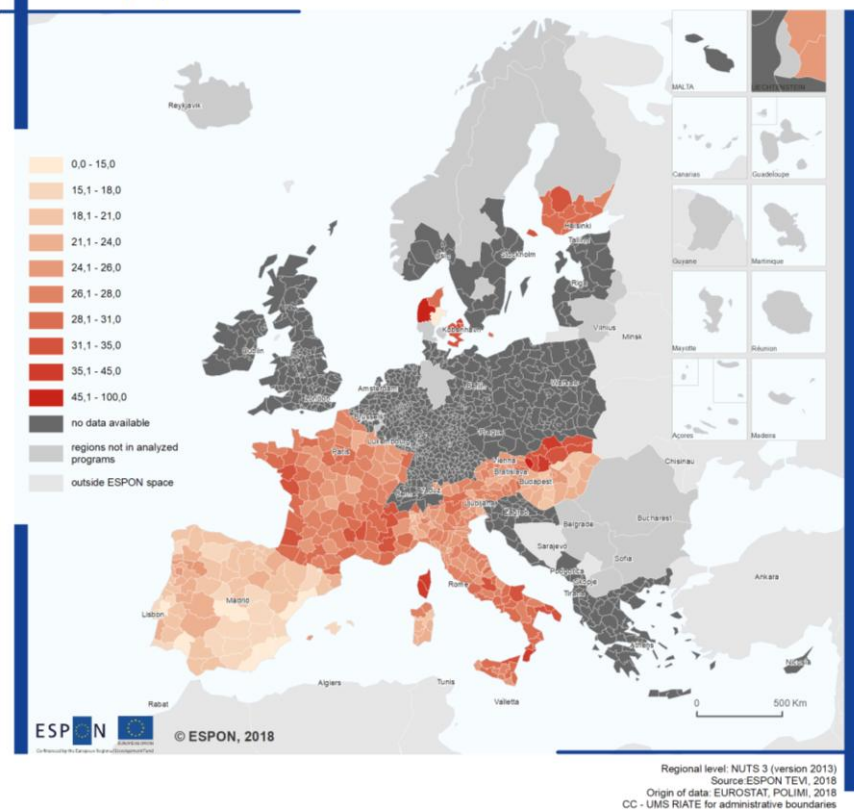
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Programme	Thematic objective	Specific objective	Output indicator	Result indicator	Proposed result indicator
Italy-Austria (1)	1	Strengthening research capacities and innovation capacities through the cross-border cooperation of research facilities	O1: Supported research collaborations (Number of collaborations) O2: Number of cross-border active researcher in the projects (Number of persons) O3: Number of research institutions which participate in cross-border research projects (Organizations)	Share of cross-border active researchers at research institutions in the program area (Number of researchers in transnational R & D projects / Number of total researchers (%))	Number of scientific products (patents, papers) co-authored by cross-border actors
Italy-Austria (2)	1	Promote investment in R&I by strengthening cross-border cooperation between companies and research institutions	O1: Number of activated clusters, platforms and networks (Number of clusters, platforms, networks) O2: Number of companies that receive support (enterprise) O3: Number of enterprises receiving grants (enterprise) O4: Number of enterprises which receive non-financial support (enterprise) O5: Number of new enterprises supported (enterprise) O6: Number of companies that participate in cross-border research projects (enterprise)	Number of companies participating in cross-border networks and innovation clusters (Number of companies that are active in networks and innovation clusters)	Number of scientific products (patents) co-authored by cross-border actors
Italy-Austria (6)	9	Promotion of integration and of local ownership in its immediate frontier zone with integrated cross-border strategies in accordance with the CLLD approach	O1: Number of CLLD strategies (Number of CLLD strategies) O2: Number of small-scale projects (Number of small-scale projects) O3: Number of cross-border working groups (Number Working Groups) O4: New cross-border mobility solutions (Number of Mobility Solutions)	Participation of civil society actors on the cross-border development strategies (CLLD) (number of players)	Number of cultural events organized and attendance (to be controlled for other influential factors through DID)

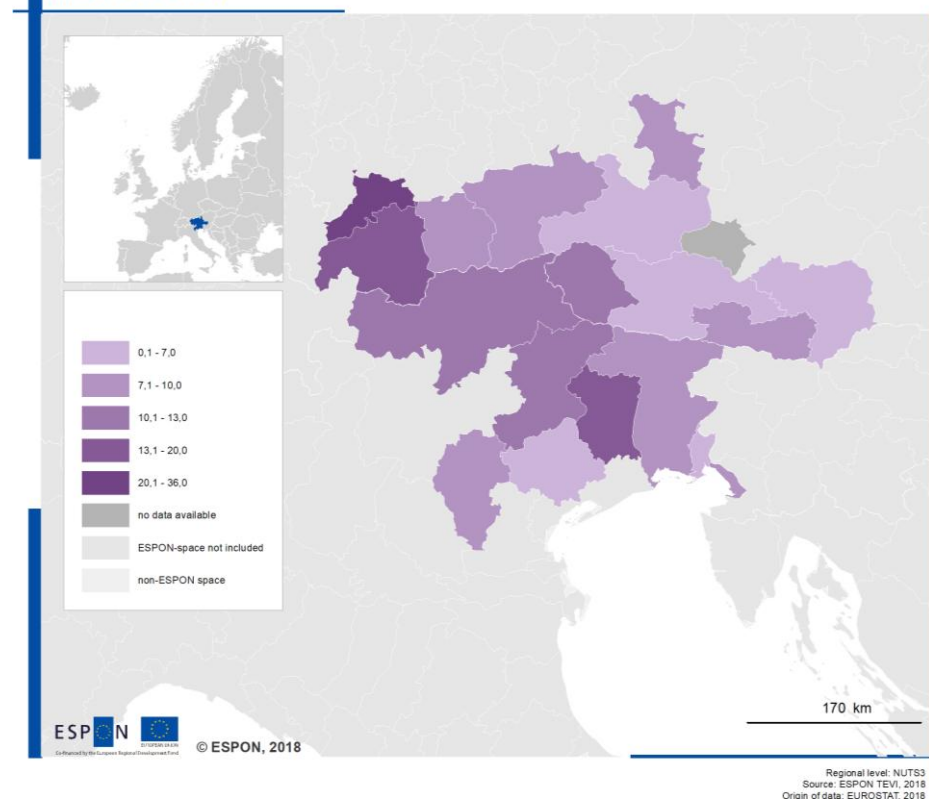
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)

Composite Indicator: patent applications + trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined timeperiod. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the composite indicator.

Northern Italian NUTS-3 regions show, within the programme area (Map 4.1) relatively high levels of knowledge-intensive industries. This specialization is rather homogeneous among the Italian part of the eligible area, with the highest values in the province of Treviso. It is interesting to note that, while the specialization in knowledge-intensive sectors is typically associated to the presence of large cities, generating a fertile environment for this kind of businesses, the Italian regions participating to the INTERREG Programme Italy-Austria are characterized by the presence of medium cities. However, most of these centres are character-

⁶nama_10r_3gva

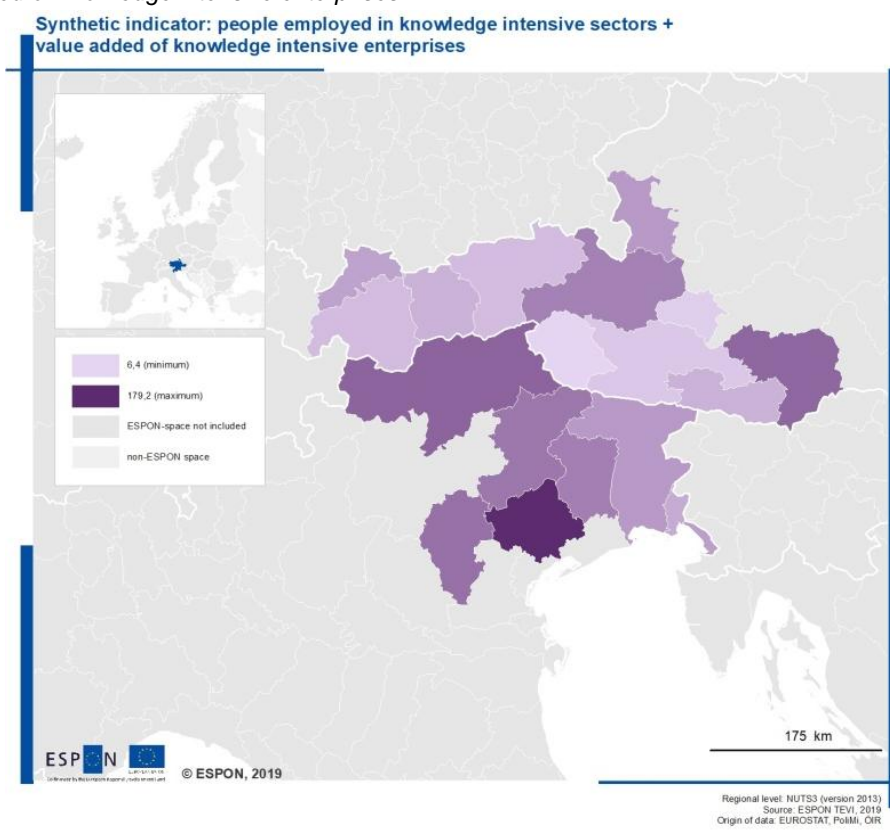
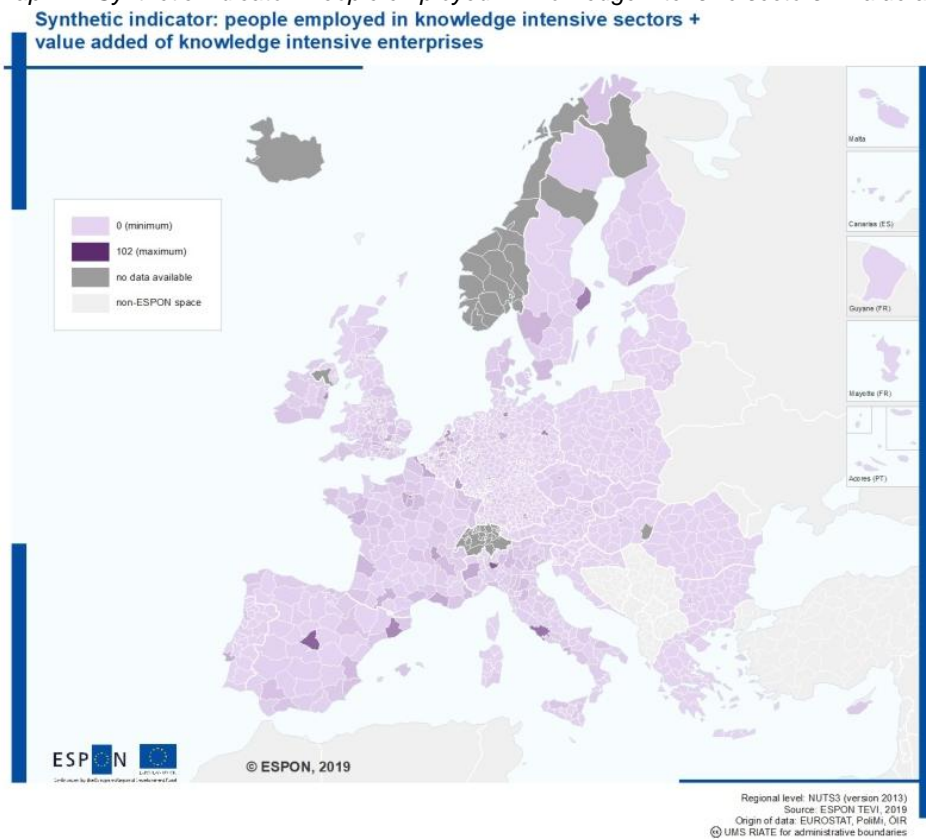
⁷nama_10r_3empers

ized by the presence of universities and by a proactive entrepreneurial tradition, broadly discussed by the economic literature on the economic development of north-eastern Italy. The Austrian regions involved in the INTERREG Programme, on the other hand, are characterized on average by a lower presence of knowledge-intensive industries. The highest values of the composite indicators are those of the region of Unterkärnten and Pinzgau-Pongau, with a stronger concentration along urban regions.

More in general, the presence of knowledge-intensity industries within the Programme area is compared with the rest of the European Union in the map on the right (Map 4.1). This representation shows that the knowledge-intensive sectors are clustered within few regions, marked by the presence of large cities. Nevertheless, the values characterizing the regions of the INTERREG Programme Italy-Austria are higher than the average ones of the country, and especially of Italy, where the intensity of the indicator is progressively decreasing moving towards the southern part of the country.

The recent economic recession, whose effects have been particularly negative for the Italian side of the Programme area, called for a revision of the economic strategies of the whole region, with particular reference to the identification of the areas for Smart Specialization and support for the business during the period of adaptation and transformation. From this perspective, one of the objective of the INTERREG Programme is to intensify and reinforce the collaboration between Italian and Austrian firms. The same applies also to the numerous universities and research institutes active on the two sides of the border, whose collaboration activities have been frequent and successful but, in spite of this, they did not led to stable, long-term cooperation.

Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises



4.2 Innovation

The maps below present the synthetic composite indicator *Innovation* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Innovation in the framework of the indicator is restricted to technical innovation via patent and trademark registration, thus not necessarily reflecting the status of social innovations. The composite indicator quantifies the innovation outputs undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework innovative economic activities. The indicator is calculated in the following manner:

$$Innovation = \frac{1}{2} * P_{i,t} + \frac{1}{2} * T_{i,t}$$

In which the variable $P_{i,t}$ represents normalised patent application values per NUTS-3 region to the European Patent Office in region i and at time t . Analogously, $T_{i,t}$ represents normalised trademark applications in a given region i and at time t . Thus, the indicator captures scientific and technical innovation, in addition to capturing process innovation via new products and similar by companies. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Trademark values on NUTS-3 level are obtained via the indicator European Union trade mark (EUTM) applications by NUTS 3 regions⁹.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator, on both sides of the border.

As far as Italy is concerned, the highest values of the indicator are found in the provinces of Bozen/Bolzano, Treviso and Gorizia, while the maximum value in the Programme area is the one of Innsbruck, in Austria. In general, the highest values of the indicator are in correspondence of urbanized areas. While the picture is rather heterogeneous, with most of the other regions in the area characterized by relatively lower values of the indicator compared with

⁸ tgs00041

⁹ ipr_ta_reg

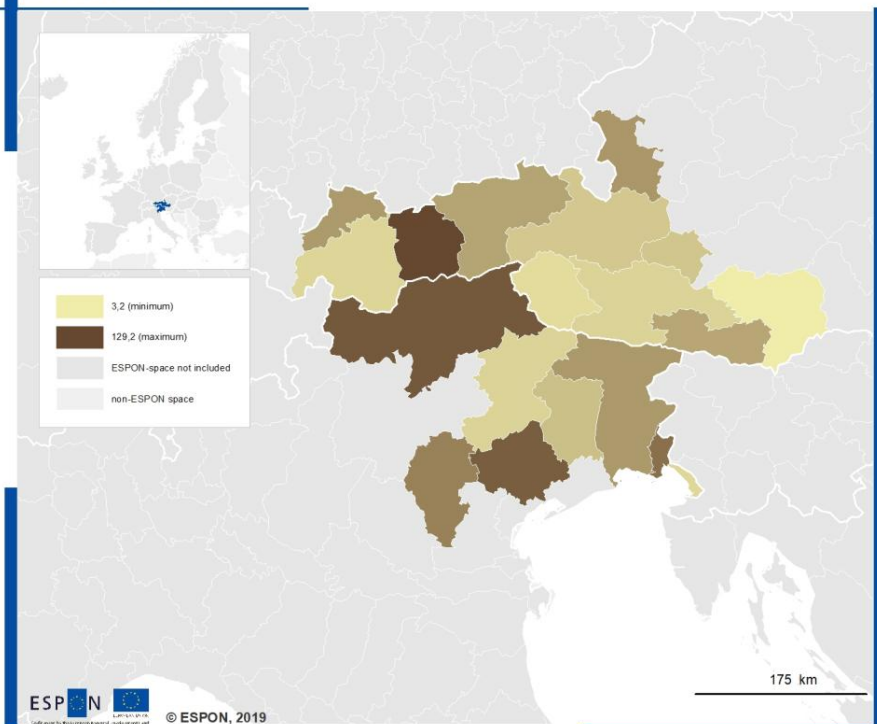
those mentioned above, the best performers achieve a level of innovation capability comparable to the most innovative European regions (map 4.2 on the right).

Innovation is certainly an important asset of the Programme area and, following the contraction in patenting observed in 2008, in correspondence of the beginning of the economic recession, also one of the main focuses of the cooperation strategy. In fact, the Programme area is characterized by the presence of 61 universities, equally distributed between Italy (30) and Austria (31). Moreover, 42 research centres are active, 26 of them in Italy and 16 in Austria.

The high number of institutions is certainly a richness but, at the same time, their average small size and their dispersion over the territory may lead to an inefficient use of the human and technological resources available. For this reason, the main aim of the Programme is to promote the specialization of these institutions in specific thematic research areas, stimulating more intense cooperation and the shared use of technological and research infrastructure. In this perspective, the development of stronger cross-border cooperation will focus on the relationship between research institutions and firms, favouring the transfer of knowledge from one kind of actors to the other one and vice versa. Support will be provided to businesses for the experimental phase of their innovation and, also, for the constitution of clusters and networks of firms.

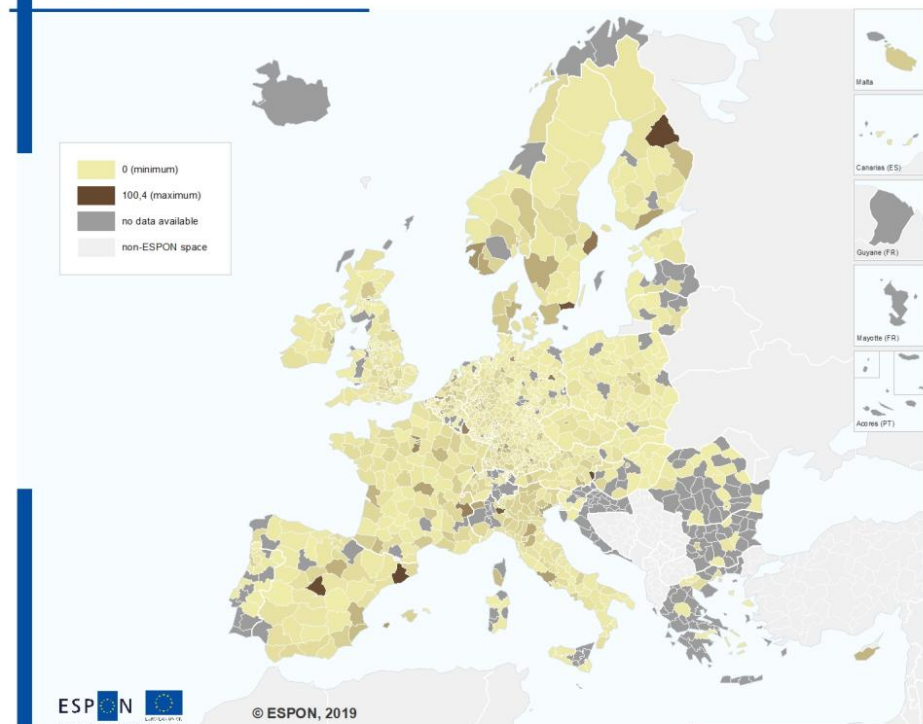
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Poitelli, CIR

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors

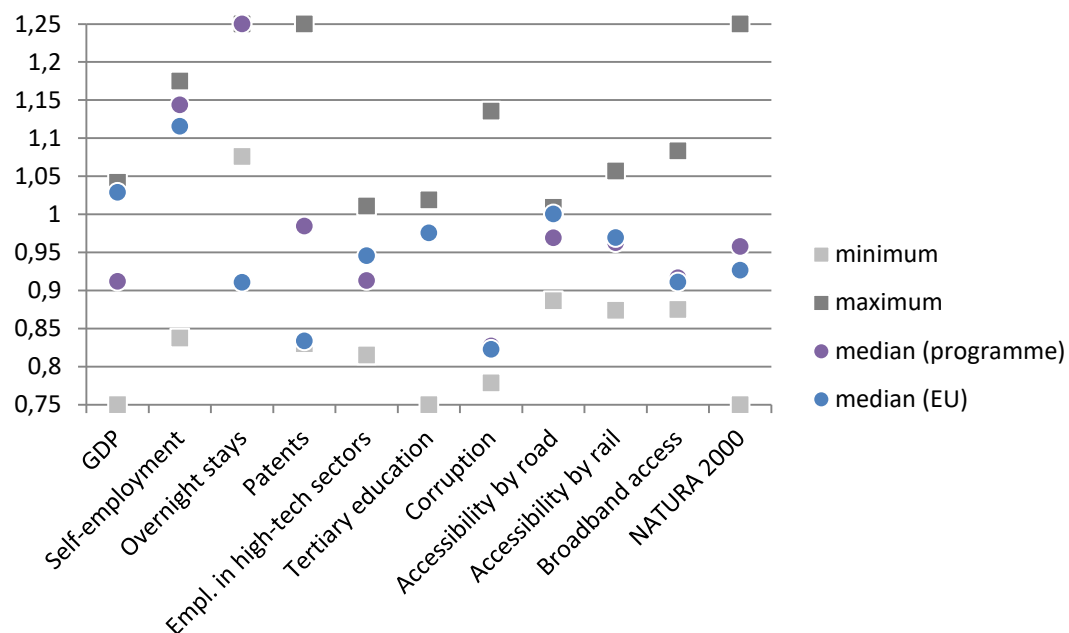


Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Poitelli, CIR
© UMS RIATE for administrative boundaries

4.3 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The results of this analysis, reported in Figure 4.1, mirrors the high heterogeneity of the regions included within the Programme Area. This territorial differentiation is evident if we consider the indicators whose median value for the Programme Area is higher than the EU28, i.e. those areas in which the Italian-Austrian regions are performing better than the rest of the EU.

In this category we find the number of overnight stays and the number of NATURA 2000 sites, which reflect the vocation of the territory for tourism and the variety of unique natural and cultural attractions available. While the positive performance in these two indicators re-

flects the natural heritage of the mountainous regions, the other two sectors where the Programme Area are outperforming the EU28 are the self-employment rate and the number of patent applications. These two indicators, typically associated to urbanized regions rather than to rural areas, reflect the well established presence of many universities and research centres, but also the high level of entrepreneurship and presence of SMEs in the economic sectors of specialization of the Programme Area.

The same interpretation applies to the indicators whose performance in the Italian-Austrian regions is relatively worse than in the rest of the EU28. The poor accessibility by car, for instance, is associated to the peculiar morphology of a vast part of the area, characterized by mountains and forests. This poor score is somehow compensated by the presence of railway connections that guarantee a level of accessibility comparable with the EU28 median, including also important transportation lines like the Brenner corridor. Also the relatively poor specialization in high-tech sectors, which could seem in contrast with the abovementioned result about patenting, mirrors an innovative productive environment, but mostly in the sectors of traditional specialization of the Programme Area. Again, this is typical of socioeconomic environments deeply rooted in their traditions, characterized by the presence of small and medium cities that, despite the presence of universities and research centres, do not host all the economic functions typical of larger urban areas. From this perspective, the various objectives of the cooperation strategy, aimed at building cross border networks in several fields among the actors and institutions involved, may lead to an increase of the “critical mass” able to overcome the limitation represented by the small-medium level of urbanization.

As far as the other indicators are concerned (tertiary education, perceived corruption and broadband access), the Italian-Austrian regions are performing on average as the rest of the EU 28. Nevertheless, the distribution of the regions can provide useful information. In the case of corruption and tertiary education, Figure 4.1 shows that the median value of the Programme Area is much closer respectively to the minimum and to the maximum of the two indicators. This implies, in the case of perceived corruption (whose interpretation is opposite compared with the other indicators, i.e. a high value of corruption has to be interpreted in a negative way) that one half of the regions of Programme Area, have a value between the minimum and the median, i.e. particularly low. The same applies in the case of tertiary education. Here, one half of the regions have a level of tertiary education between the median of the Programme Area and the maximum value registered, which is slightly higher.

On the other hands, the opposite holds for the level of broadband access. In this case, being the median of the Programme Area much closer to the minimum than to the maximum, fifty per cent of the regions are characterized by rather low values of the indicator.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

	Strengths	Weaknesses	Opportunities	Threats
Strengthening research capacities and innovation capacities through the cross-border cooperation of research facilities	Presence of several university and research centres High level of skills and entrepreneurship in the resident population	Inequality in the innovation density between urbanized and peripheral areas	Opportunity of applying to H2020 projects Tradition of cooperation activities in R&I	Differences in the strategic approach to research between the national and regional level Brain drain, especially in mountain areas
Promote investment in R&I by strengthening cross-border cooperation between companies and research institutions	Positive trend of the R&D expenditure in the Austrian eligible regions High level of skills and entrepreneurship in the resident population	Inequality in the innovation density between urbanized and peripheral areas Low occupation levels in sectors with high technological intensity and poor private investments in R&I	Field of common specialization in R&I (medicine, culture, tourism) Promotion of cooperation models between private and public actors	Differences in the strategic approach to research between the national and regional level Brain drain, especially in mountain areas
Improving the innovation base for companies in the program area.	Unemployment rates lower than the national average values Education sector provides strong skill base for enterprises	Inequality in the innovation density between urbanized and peripheral areas Relatively low regional competitiveness Reliance on tourism as an important economic sector Rural areas marked with low (multi-modal) accessibility	Possibility to exploit the new technologies to facilitate the access to services Interest of both entrepreneurs and users for new types of tourism, necessity to diversify	Structural weakness of SMEs in mountain areas, cyclicity Reductions in economic diversity due to reliance on tourism in rural areas, declining relative importance of agriculture Presence of many areas with high economic specialisation

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strengths	Weaknesses	Opportunities	Threats
Protection and promotion of natural and cultural heritage	Presence of a rich natural and cultural environment Uniqueness of the Alpine landscape High level of biodiversity High use of renewable resources Availability of hydric resources and high quality of water	Land use conflicts: limited land available for residential, commercial, industrial uses Territorial vulnerability to natural hazards Limited coordination of investment strategies at the regional and local levels	Common legal framework for the protection of biodiversity Increase at the national, regional and local level of the demand for renewable energy	Potential decrease of the environmental quality in urban areas Constant loss of attractiveness of mountain areas in the winter season due to global warming Increasing fragmentation of the natural spaces due to infrastructures Possible conflicts

	Strengths	Weaknesses	Opportunities	Threats
	Awareness of the potential environmental risks	Renewable energy sources used to significantly lower extent in Italian regions		between regions on water management High risk of negative externalities of global climate change on local environment

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

	Strengths	Weaknesses	Opportunities	Threats
Strengthening cross-border institutional co-operation in the central areas of the program area	Positive population trend, especially in urban areas Strong recovery of the labour market after mid-2010s Increasing youth employment rates, with higher values for AT than IT	Territorial fragmentation, poor supply of services in peripheral areas Difficulty in the adjustments of the services provided consistently with the new needs of people at risk of exclusion	Initiatives "Resource efficient Europe" and "Industrial policy for the globalization era" Greater centrality of inclusiveness within the definition of social policies Possibility to exploit the better situation of the AT job market to improve occupation in the IT bordering regions	Increasing divide between urban and rural areas, as far as accessibility and dependency rates are concerned Low unemployment and activity rates in the IT eligible areas Loss of human resources at the local level due to the scarcity of opportunities Lack of a common cross border governance for the employment services
Promotion of integration and of local ownership in its immediate frontier zone with integrated cross-border strategies in accordance with the CLLD approach	Positive population trend, especially in urban areas Sensitivity of the population for social inclusiveness issues Increasing youth employment rates, with higher values for AT than IT	Progressive ageing of the population and reduction of the net migration balance in IT Difficulties in the definition in social policies	Initiatives "Resource efficient Europe" and "Industrial policy for the globalization era" Possibility to transmit the knowledge and skills of artisans to the new generations	Reduced economic activity rates among women compared to men Brain drain within the programme area to metropolitan centres outside

5.1.4 Main Challenge and Needs

Table 5.4: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	Positive trend of the R&D expenditure in the Austrian eligible regions High level of skills and entrepreneurship in the resident population	Lack of incentives and instruments for the support of cooperation between firms and research centres Inequality in the innovation density between urbanized and peripheral areas	Field of common specialization in R&I (medicine, culture, tourism) Possibility to exploit the new technologies to facilitate the access to services	Brain drain, especially in mountain areas Differences in the strategic approach to research between the national and regional level Presence of many areas with high economic specialization, affecting regional resilience

	Strengths	Weaknesses	Opportunities	Threats
				to economic shocks
Sustainable growth	High use of renewable resources in the AT eligible area and in IT province of Bolzano Awareness of the potential environmental risks	Territorial vulnerability to natural hazards Limited coordination of investment strategies at the regional and local levels	Increase at the national, regional and local level of the demand for renewable energy "Green energy" as an element for the promotion of the image of the area	Possible conflicts between regions on water management High risk of negative externalities of global climate change on the local environment
Inclusive growth	Increasing youth employment rates, with higher values for AT than IT Strong recovery of the labour market after mid-2010s	Territorial fragmentation, poor supply of services in peripheral areas Difficulty in the adjustments of the services provided consistently with the new needs of people at risk of exclusion	Greater centrality of inclusiveness within the definition of social policies Possibility to exploit the better situation of the AT job market to improve occupation in the IT bordering regions	Reduced economic activity rates among women compared to men Brain drain within the programme area to metropolitan centres outside

Strengths

R&D expenditure is strong in the programme area, particularly in the Austrian regions. A significant positive trend in R&D expenditure together with a strong human capital basis (in the form of enterprise density and tertiary education graduation rates) provide a solid foundation for the economic strength of the region. Large parts of the programme area use a high share of renewable resources in their energy mix. This is observable in the AT eligible area and in IT province of Bolzano. Despite the relatively slower economic recovery of the regions bordering the programme area to the south, positive performance is observed in the labour market in several areas. Youth employment is also on the rebound, however, stronger in Austrian than in Italian regions.

Weaknesses

Inequality in the innovation density between urbanised and peripheral areas is an observed weakness of the programme area. Brain drain from more mountainous and rural areas hampers the innovation capacity of local SMEs, potentially also in the long term. Natural hazards and the territorial complexity of the programme area significantly affects accessibility of more mountainous tracts of the programme area. This also affects the degree to which services of general economic interest can be supplied to residents. Territorial fragmentation, poor supply of services in peripheral areas reduces viability of SMEs, especially in the manufacturing field, due to the importance of integrated supply chains.

Opportunities

Opportunities in terms of economic development stem from shared fields of regional specialisation. Synergies can be enhanced in R&I in medicine, culture and tourism related activities. The possibility to exploit the new technologies to facilitate the access to services can also enhance regional economic capacities. Increased usage of green energy as a label in adver-

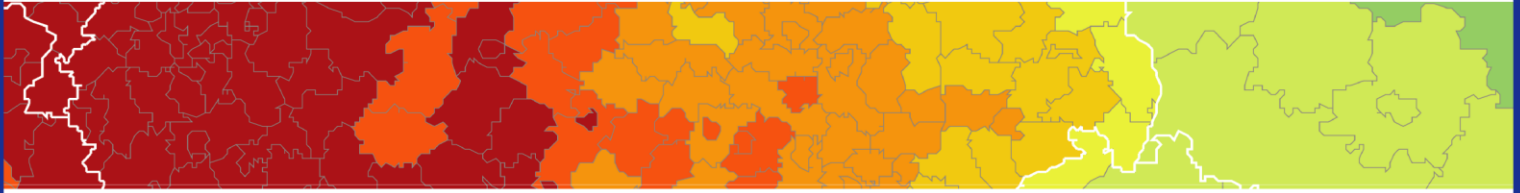
tisement may improve (inter)national visibility of the regions as destinations and contribute to the positive image of the area. An additional opportunity is to enhance cross-border regional labour cooperation to improve occupation in the AT- IT bordering regions and counteract labour market imbalances between the two countries.

Threats

Brain drain, especially in mountain areas, poses a strong threat to the programme area. With relatively more educated individuals moving to urban centres, rural areas may face underpopulation and increased reliance on basic service industries (i.e. tourism). With climate change severely affecting vulnerable habitats in the Alps and more irregular weather, an overreliance on tourism may decrease the regions' reliance to macro-economic shocks. Within the programme are many areas feature a high level of with high economic specialisation, with tourism forming an important source of income. With tourism growing relatively strong in importance to the regional economy, resilience to macro-economic shock is in decline. Further, cyclicity of the tourism industry in off-seasons (primarily spring, early summer and autumn) may further decrease the resilience of the programme area.

References

INTERREG IT-AT (2017). Programma di cooperazione Italia-Austria 2014-2020, Version n. 3
25.07.2017.



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

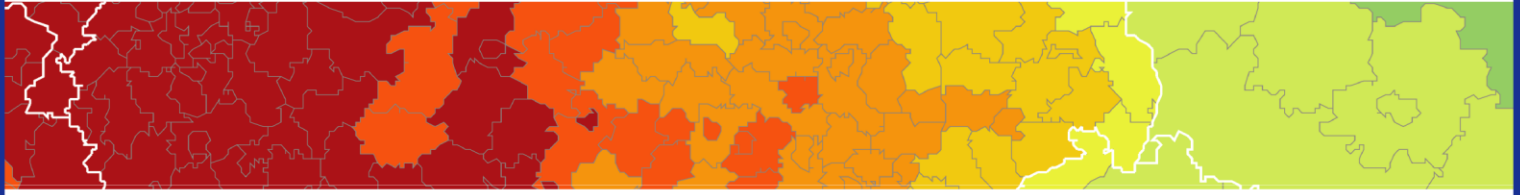
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG A Italy-Croatia

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG A Italy-Croatia

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview needs and challenges	3
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	4
3 Indicators	7
3.1 Initial result and output indicators used in assessment	7
3.2 Proposed Key Territorial Indicators.....	11
4 Benchmarking.....	15
4.1 Gross Value Added in Knowledge-Intensive Sectors	15
4.2 Human Capital in the Programme Area	18
4.3 Tourism and Sustainability.....	21
4.4 Regional Scoreboards.....	24
5 Reference Analysis	27
5.1 Territorial specificity of the programme area.....	27
5.1.1 Smart Growth	27
5.1.2 Sustainable Growth.....	27
5.1.3 Inclusive Growth	29
5.1.4 Main Challenge and Needs.....	29
References	30

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	7
Figure 4.1: Regional Scoreboard.....	24

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	14
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	14
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	17
Map 4.2: Synthetic indicator: Number of patents + employment in medium knowledge intensive sectors + employment in highly knowledge intensive sectors	20
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	23

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.	11
Table 5.1: SWOT Analysis Smart Growth	27
Table 5.2: SWOT Analysis Sustainable Growth.....	27
Table 5.3: SWOT Analysis Inclusive Growth.....	29
Table 5.4: SWOT Analysis Overall Challenges and Needs	29

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

The Programme involves eight NUTS3 regions in Croatia and twenty-five NUTS3 areas in Italy. All the regions are located on the Adriatic Sea. The area covered by the Programme spreads over 85.562 km² and the population involved was equal to 12.487.910 inhabitants in 2017. The majority of the population (88%) is resident in Italy. Population density of the eligible area is, in the case of Italy, slightly below the national average (191.90 vs. 200.6 inhabitants per km²). Italian NUTS3 regions involved in the Programme are characterized by the presence of several medium-size cities (four above 200,000 inhabitants and six above 100,000 residents). The same holds in the case of Croatia, since the eligible area is characterized by a population density equal to 53.03 inhabitants per km², against a country-average of about 75.8. The two biggest urban centres involved in the Croatian territory are Split and Rijeka with, respectively, 178.102 and 128.624 inhabitants.

The socioeconomic conditions of the two groups of regions are rather different. Per capita GDP in the Italian eligible area was, in 2015, lower than the national value (€ 24,853 vs. € 27,200 per inhabitant). The Croatian NUTS3 regions involved in the Programme are also characterized by a per capita GDP lower than the country average, even if to a lower extent (€ 10,083 vs. € 10,600 per inhabitant).

The economic specialization of the Italian eligible regions was, in 2015, more oriented than the country average towards manufacturing (17.1% vs. 16.0% of value added) and retail trade and transport (21.2% vs. 20.5% of value added), reflecting the presence of large ports. On the other hand, the specialization in ICT and professional, scientific and technical activities is lower than the country average (29.7% vs. 32.9% of value added). The Croatian eligible area is less specialized than the country in agriculture (2.60% vs. 4.40% of value added) and manufacturing (10.3% vs. 14.9% of value added), while a higher portion of value added is generated by retail trade and transport (26.8% vs. 22.1%) and construction and real estate activities (20.7% vs. 15.5%). As for Italy, also the Croatian regions involved in the Programme are less specialized than the country in ICT and professional, scientific and technical activities (27.4% vs. 29.2% of value added).

The total budget of the OP amounts to € 236,890,849, and the EU contribution, via ERDF, is equal to € 201,357,220.

2.2 Contribution to EU 2020 strategy & situation in the programme area

The overall programme objective for the 2014-20 programming period is to increase the prosperity and the blue growth potential of the area by stimulating cross-border partnerships able to achieve tangible changes. The Programme contributes to all the three EU 2020 strategy pillars.

As far as *Smart Growth* is concerned, the Programme aims at enhancing the framework conditions for innovation in the relevant sectors of the blue economy, with the purpose of reducing the gap, in terms for instance of R&D intensity and availability of ICT services, of eligible regions compared with the EU average.

Sustainable Growth is the strategy pillar on which most of the actions are focused. The coastal geographical location of the eligible area, jointly with its rich natural and cultural heritage calls for policy actions aimed at preserving these resources. From this perspective, the Programme will lead to an improvement of the monitoring system for climate change, increasing the safety of the area from natural and man-made disasters. At the same time, actions will be focused on the improvement of environmental quality and biodiversity in the sea and coastal areas. These resources, jointly with the cultural heritage, will be used as a leverage for sustainable territorial development through, for instance, tourism. A specific line of action is identified in the improvement of safety, quality and environmental sustainability of marine and coastal transport services in the Programme area.

Finally, a contribution in the strategy pillar of *Inclusive Growth* is expected to be indirectly achieved by the abovementioned actions on the other two. There is a potential, for instance, for an increase in the specialization of the workforce in the sectors of the blue economy where the eligible regions have a competitive advantage. Similarly, actions under the Sustainable Growth pillar aimed at fostering territorial development are expected to producing an effect on regional employment.

2.3 Overview needs and challenges

The needs and challenges of the Programme area are strictly related to the strengths and opportunities characterizing these regions.

Given the high density of SME, there is the need to increase their level of competitiveness on the international markets, facilitating the involvement in international networks and the access to high-skilled human resources, also through collaborations with the 23 universities located in the Programme area. Given the geographical position and the historical economic specialization, relevant sectors of the blue economy are the richest ones in terms of opportunities.

The endowment natural and cultural heritage calls for needed actions in the territories' adaptive capacity to climate change and degradation. The intense anthropic pressure on the environmental resources calls for actions aimed at preventing disasters, and also at improving the environmental quality of the Adriatic basin.

At the same time, however, the richness of the natural and cultural heritage implies some opportunities for the specialization in sustainable tourism and the increase in the systemic and efficient maritime connections between eligible territories.

The need to increase the accessibility to the eligible regions through safe, environmentally sustainable marine and coastal transport services is also among the priorities of the Programme.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1.1: Enhance the framework conditions for innovation in the relevant sectors of the blue economy within the cooperation area

Priority Axis 1: Blue Innovation (TO1, IP 1b)

- *Brief justification:* Both countries lag behind EU28 in R&D expenditure as well as in number of patent applications to EPO. There is therefore a need to improve SMEs competitiveness through innovation in specific business niches.
- *Main change sought:* increase of firms' competitiveness in the sectors identified (sustainable tourism, aquaculture, and shipbuilding, creative industries).
- *Expected activities:* Joint projects and actions aimed at creating platforms, networks and at supporting exchange of good practices in order to enhance the knowledge transfer in the field of blue economy.
- *Beneficiaries:* local, regional and national public authorities, regional and local development agencies, chambers of commerce and other business support organisations, SMEs.

Specific objective 2.1: Improve the climate change monitoring and planning of adaptation measures tackling specific effects, in the cooperation area

Priority Axis 2: Safety and resilience (TO5, IP 5a)

- *Brief justification:* the Adriatic coastal area has vulnerable ecosystem that is very receptive to negative effects of the climate change.
- *Main change sought:* increase both the awareness about the threaten of climate change and the protection of the potentially vulnerable areas.
- *Expected activities:* Actions aimed at improving the knowledge base, data and monitoring systems supporting adaptation capacity, increasing the capacity for planning of adaptation measures.
- *Beneficiaries:* local, regional and national public authorities and related entities, regional and local development agencies, environmental agencies, regional associations, NGOs, education and training centres, Universities and research institutes.

Specific objective 2.2: Increase the safety of the Programme area from natural and man-made disaster

Priority Axis 2: Safety and resilience (TO5, IP 5b)

- *Brief justification:* There is a need to improve monitoring measures for prevention of damage caused by natural disasters such as erosion, droughts and floods, also due to the intense human activities in the Adriatic basin.
- *Main change sought:* reduction of the risk related to the occurrence of natural disasters and the risk associated to human activities.
- *Expected activities:* actions aimed at improving monitoring of risks, activities aimed at increasing the management capacity of/prompt response to disasters

- *Beneficiaries:* local, regional and national public authorities and related entities, regional and local development agencies, environmental agencies and regional associations, Emergency services and coast guard centres, NGOs, education and training centres, universities and research institutes.

Specific objective 3.1: Make natural and cultural heritage a leverage for sustainable and more balanced territorial development

Priority Axis 3: Environment and cultural heritage (TO6, IP 6c)

- *Brief justification:* The Programme area is very rich in cultural and environmental resources that require proper conservation.
- *Main change sought:* to develop joint activities to improve visiting and living environment by conserving, protecting and developing natural and cultural resources.
- *Expected activities:* actions aimed at increasing the value of natural and cultural heritage by developing and implementing protection and promotion measures, aimed at fostering economic development by sustainable tourism and at decreasing the human pressure to natural and cultural heritage sites.
- *Beneficiaries:* local, regional and national public authorities, public service providers, cultural and natural heritage management bodies, regional development agencies, enterprises, associations, regional innovation agencies, NGOs, education and training organisations, universities and research institutes.

Specific objective 3.2: Contribute to protect and restore biodiversity

Priority Axis 3: Environment and cultural heritage (TO6, IP 6d)

- *Brief justification:* an important part of the Adriatic Sea is beyond national jurisdiction limits, cross-border cooperation is vital to ensure an efficient protection of marine biodiversity.
- *Main change sought:* securing sustainable use of marine and coastal ecosystems and resources.
- *Expected activities:* actions aimed at improving the knowledge base, data and monitoring systems for protecting biodiversity and ecosystems, at supporting the restoring of biodiversity.
- *Beneficiaries:* local, regional and national public authorities, protected areas/natural heritage management bodies, regional and local development agencies, associations, NGOs, education and training organizations, universities and research institutes.

Specific objective 3.3: Improve the environmental quality conditions of the sea and coastal area by use of sustainable and innovative technologies and approaches

Priority Axis 3: Environment and cultural heritage (TO6, IP 6f)

- *Brief justification:* Anthropogenic polluting activities of the marine environment require coordinated interventions.
- *Main change sought:* to reduce inflows of hazardous substances to the Adriatic basin.
- *Expected activities:* developing, demonstrating and implementing small-scale innovative environmental friendly technology actions and approaches and innovative actions aimed at improving the knowledge on the environmental quality.
- *Beneficiaries:* local, regional and national public authorities, regional and local development agencies, SMEs and business supporting organizations, associations, innovation and environmental agencies, NGOs, education and training organizations, universities and research institutes.

Specific objective 4.1: Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the programme area
Priority Axis 4: Maritime transport (TO7, IP 7c)

- *Brief justification:* There is a strong need to reduce the environmental impact of transport activities by increasing multimodality and shift to most appropriate environmental friendly modes of transport.
- *Main change sought:* to improve accessibility of the area by better data sharing and coordination
- *Expected activities:* Support coordination/harmonization/monitoring of data and systems for enhancing multimodality. Piloting tools/solutions for improving connectivity in the transport systems.
- *Beneficiaries:* local, regional and national public authorities, regional development agencies, enterprises, transport operators, infrastructure providers, transport associations, regional innovation agencies, NGOs, education and training organisations, universities and research institutes.

Synergies with other EU interventions: the programme presents several possible synergies with other EU Instruments such as:

- PA1: possible synergies with Horizon 2020, COSME, and the Connecting Europe Facility in the field of innovation.
- PA2 and PA3: complement actions and exploit results from LIFE and LIFE Integrated Projects and Horizon 2020 in the fields of environment protection, climate change, risk prevention, and resource efficiency

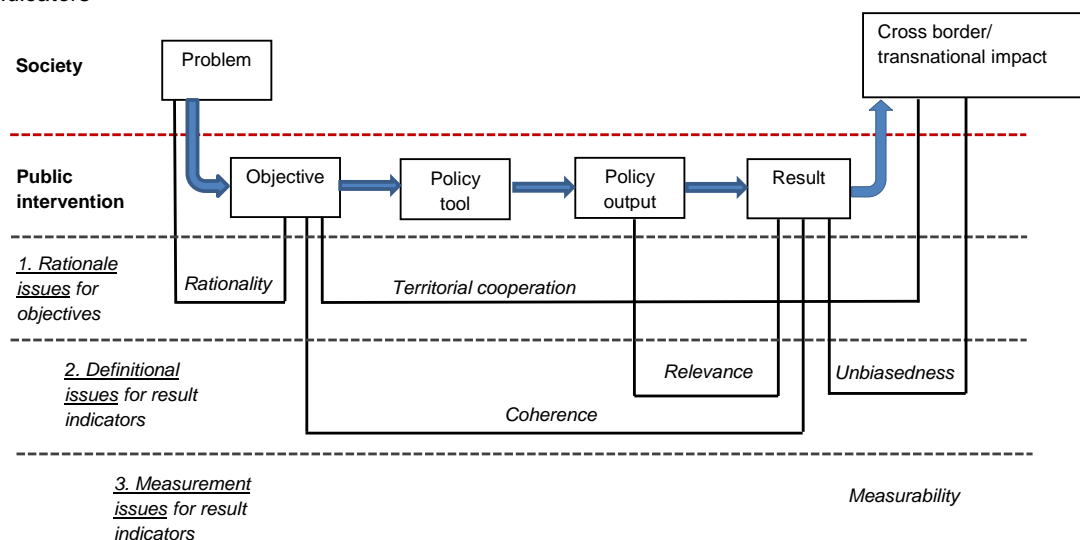
Moreover, the Programme will seek exchanges with the managing authorities of other geographically overlapping territorial cooperation programmes.

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
1	Enhance the framework conditions for innovation in the relevant sectors of the blue economy within the cooperation area	Number of EPO applications (Number)	HIGH	HIGH	HIGH	HIGH	LOW - Other factors could influence the result indicator	HIGH
5	Improve the climate change monitoring and planning of adaptation measures tackling specific effects, in the cooperation area	Inhabitants benefiting from planning of adaptation measures (Number)	MEDIUM - What kinds of threatens for climate change will be addressed?	MEDIUM - How can territorial synergies support the planning of adaptation measures?	HIGH	MEDIUM - The result indicator is measuring an outcome rather than a result	HIGH	MEDIUM - Criteria for the measurement of the coverage of such measures must be clearly defined
5	Increase the safety of the Programme area from natural and man-made disaster	Inhabitants benefiting from risk management coordinated measures (Number)	MEDIUM - What are the specific natural and man-made distasters the Programme is dealing with?	MEDIUM - How can territorial synergies support the prevention of natural and man-made disasters?	HIGH	MEDIUM - The result indicator is measuring an outcome rather than a result	HIGH	MEDIUM - Criteria for the measurement of the coverage of such measures must be clearly defined
6	Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Seasonality in tourism in the programme area (Number)	MEDIUM - What is meant by territorial development?	MEDIUM - How can territorial synergies contribute to the territorial development of the whole area, avoiding competition effects between different localities?	MEDIUM - How does seasonality of tourism contribute to territorial development? It captures just a temporal balance. A higher seasonality could be achieved also due to a reduction of tourism in the summer	MEDIUM - The relevance directly depends on the rationality of the objective	LOW - Tourism flows could depend on changes in the competitors' behaviour, contingent exogenous factors (e.g. adverse weather conditions)	HIGH
6	Contribute to protect and restore biodiversity	Excellent conservation status of habitat types and species of Natura 2000 sites in the programme area (Number)	MEDIUM - May potential trade-offs arise between objectives (4) and (5) within the Programme?	HIGH	HIGH	HIGH	HIGH	HIGH
6	Improve the environmental quality conditions of the sea and coastal area by use of sustainable and innovative technologies and approaches	Quality level of coastal bathing waters (according to the dir. 2006/7/CE) (Number)	HIGH	HIGH	HIGH	HIGH	LOW - Several exogenous factors could affect the result indicator	HIGH
7	Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the Programme area	Goods transported by maritime mode (Thousand tonnes)	MEDIUM - Quality, safety and environmental sustainability are broad concepts, their achievement could imply trade-offs	HIGH	LOW - An increase in transport could generate a decrease in sustainability	HIGH	LOW - Variation in the transportation mode could be caused by changes not under the control of the Programme	HIGH

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

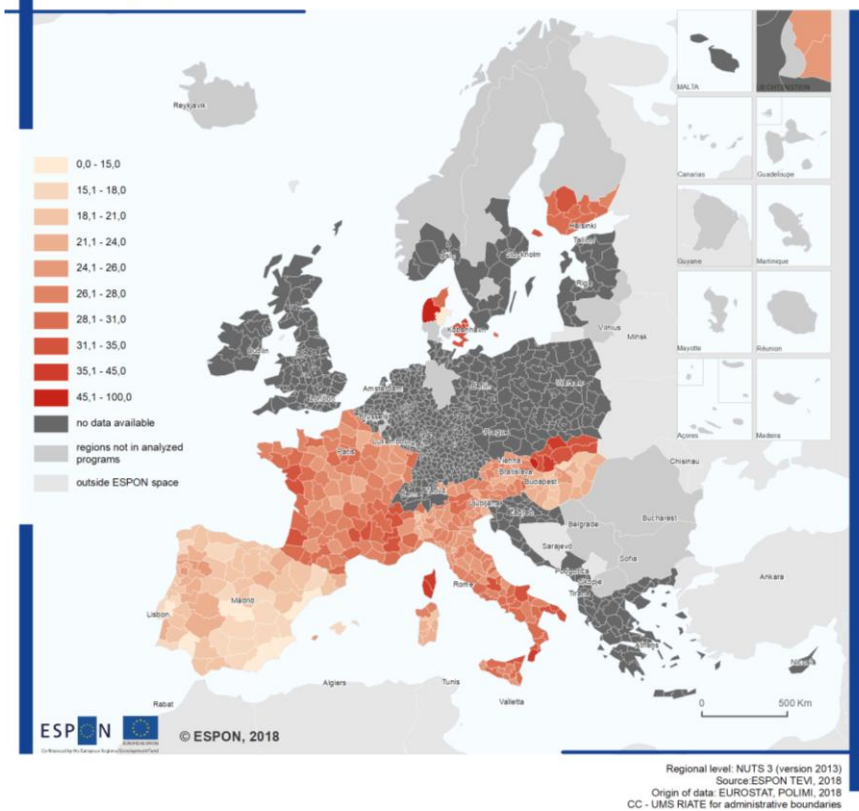
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

ETC objective	Thematic objective	Specific objective	Output indicator	Result indicator	Proposed result indicator
	1	Enhance the framework conditions for innovation in the relevant sectors of the blue economy within the cooperation area	O1: Participants to training activities (Number) CO1: Enterprises receiving non-financial support (Number) CO2: Enterprises receiving grants (Number) CO3: Research institutions participating in crossborder, transnational or interregional research projects (Number) CO4: Enterprises receiving support (Number)	Number of EPO applications (Number)	EPO applications (to be controlled for other influential factors like private R&D investments, human capital, etc. through DID)
	6	Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	O1: Cultural and natural heritage sites promoted (Number) O2: Actors involved in actions aimed at promoting natural and cultural heritage (including typical products, joint branding and tourism) (Number) O3: Natural and cultural heritage destinations with improved accessibilities (e.g.: to disabled tourists, virtual tourists etc.) in place (Number) O4: Beneficiaries with ecolabel/ green certification (Number)	Seasonality in tourism in the programme area (Number)	Synthetic indicator: number of tourists + seasonality in tourism
	6	Improve the environmental quality conditions of the sea and coastal area by use of sustainable and innovative technologies and approaches	O1: Environmental friendly technological solutions (and approaches) implemented (Number) O2: Knowledge systems put in place (Number)	Quality level of coastal bathing waters (according to the dir. 2006/ 7/ CE) (Number)	Quality level of coastal bathing waters (to be controlled for other influential factors like quality level of neighbouring coastal waters, congestion in the basin, etc. through DID)
	7	Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the Programme area	O1: Improved multimodal transport services (Number) O2: New links established (Number) O3: Harmonized services for passengers put in place (Number)	Goods transported by maritime mode (Thousand tonnes)	Synthetic indicator: goods transported by sea + average age of the ships + number of accidents

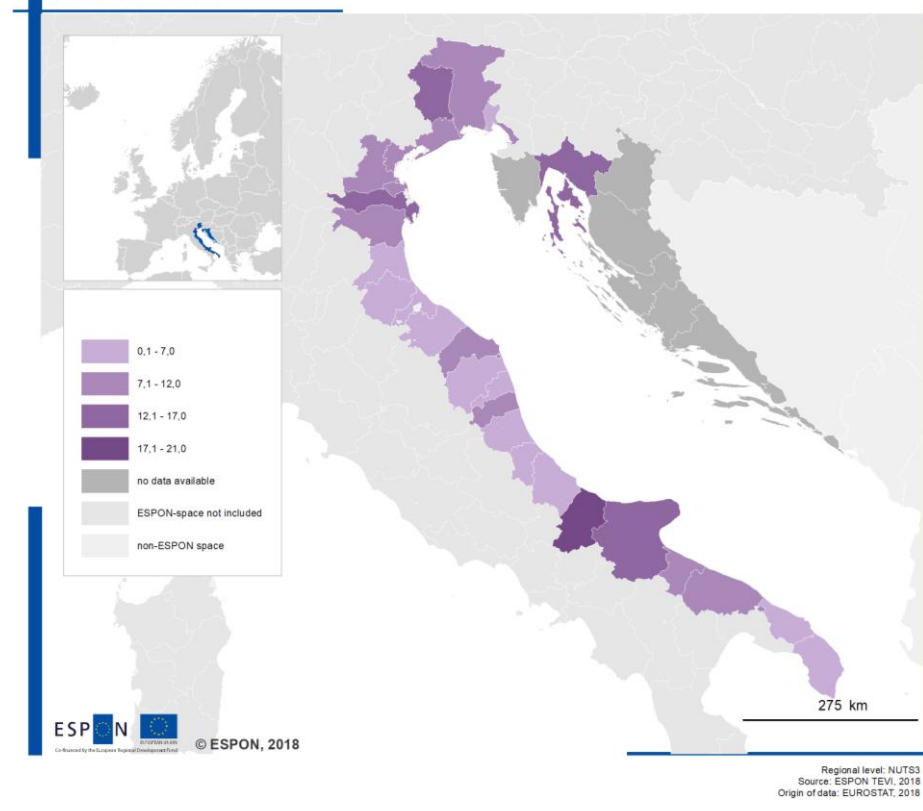
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)

Composite Indicator: patent applications + trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below (Map 4.1) present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined time period. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. A minimum of 3.3 can be observed, with corresponding maximum of 149.7.

Concerning the eligible area of the INTERREG Italy-Croatia, the highest values of the indicator characterize the northern regions, and in particular in the Italian NUTS3 regions of Venezia and Padova. On the other hand, the bordering Croatian regions are marked by lower levels of the composite indicator.

Moving down along the Adriatic coast, on the Italian side the intensity of the presence of knowledge-intensive sectors decreases. This is explained by the mostly touristic vocation of

⁶nama_10r_3gva

⁷nama_10r_3empers

these maritime regions, and by the absence, in most of them, of large cities. The association between the presence of knowledge-intensive sectors and urbanization is mirrored by the higher values of the indicator that, in southern Italy, characterize the NUTS-3 regions of Bari and Foggia, respectively the first and third cities of Apulia in terms of population. Knowledge-intensive businesses, in fact, are expected to benefit of urbanization economies, in the form of local job markets able to provide highly skilled workers (thanks to the presence of universities, for instance), better technical (e.g. broadband connection) and transport (e.g. airports, railways) infrastructure.

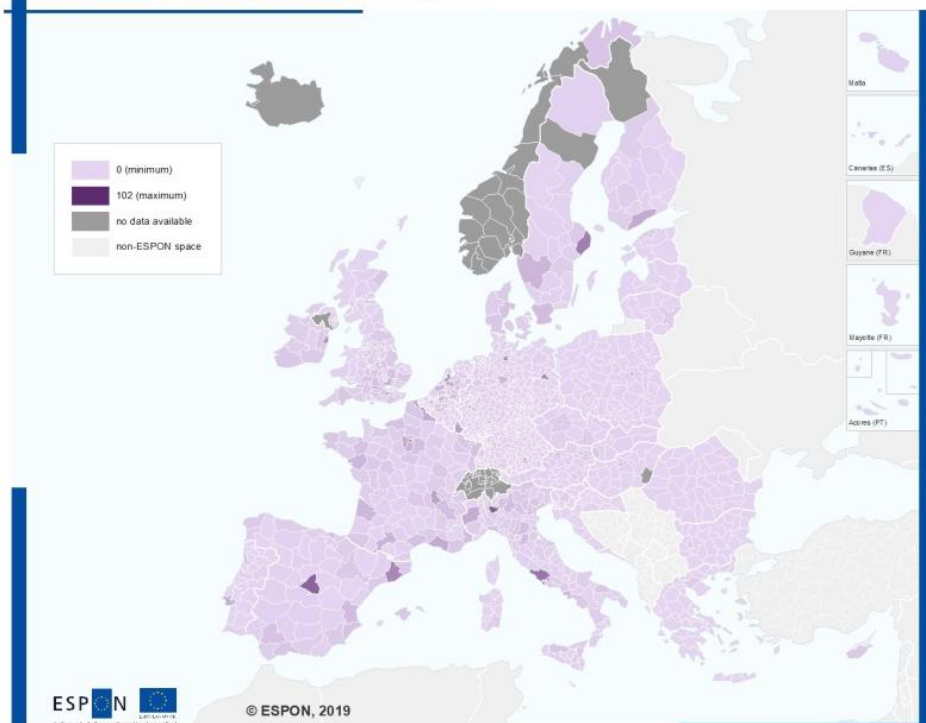
As far as the Croatian side of the Adriatic sea is concerned, the presence of knowledge-intensive sectors is lower than in the Italian counterpart, with the exception of the County of Dubrovnik-Neretva which, in spite of a relatively small size of the capital city of Dubrovnik, performs better than the County of Split-Dalmatia.

The evidence reported in the map on the left of Map 4.1 has to be also interpreted in relative terms with the rest of Europe. In this case, it is evident that the presence of knowledge-intensive sectors in the Programme Area is rather low when compared with other countries, where, once more, large cities play a predominant role.

Based on this evidence, the promotion of research activities, technological development and innovation is a specific target of the cooperation strategy, in particular within the sectors of the blue economy.

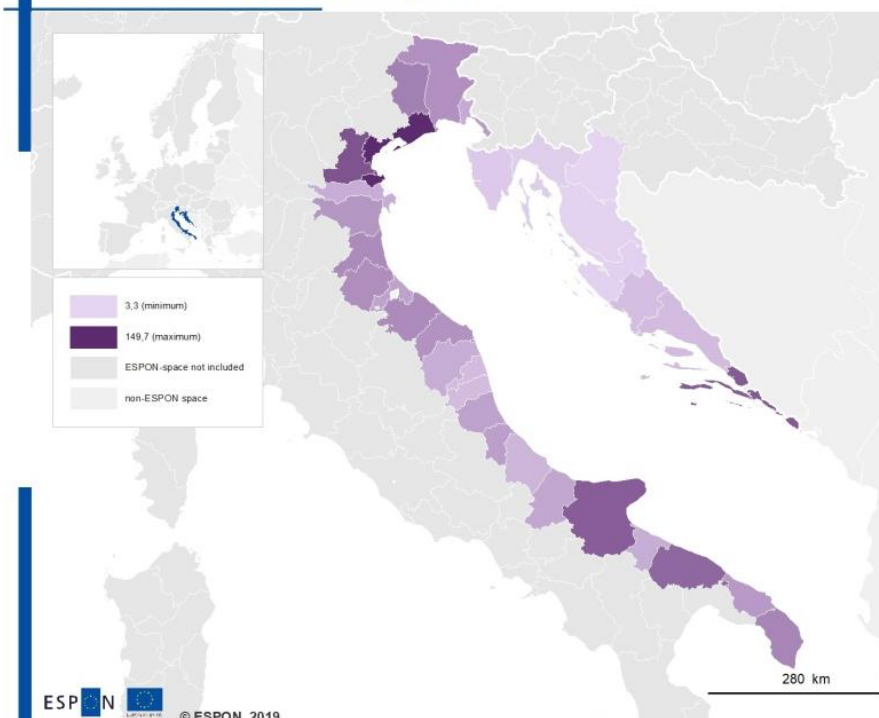
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PolMi, OIR
 © UMS RIATE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PolMi, OIR

4.2 Human Capital in the Programme Area

The maps below present the synthetic composite indicator *Human Capital in Knowledge-Intensive Areas* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Human capital refers to the stock of knowledge and abilities which are applied to produce goods and. The composite indicator reflects the stock of human capital and its distribution across the programme area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities and the necessary inputs. The indicator is calculated in the following manner:

$$HCAP_{i,t} = \frac{1}{3} * L_{i,t} + \frac{1}{3} * E_{i,t} + \frac{1}{3} * P_{i,t}$$

In which the variable $L_{i,t}$ represents overall normalised employment in medium knowledge intensive industries (e.g. financial and real estate services) in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment specifically in highly knowledge intensive industries (e.g. R&D) in a given region i and at time t . The variable $P_{i,t}$ represents registered patents per NUTS-3. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Data on employment in knowledge intensive sectors was obtained from the NACE dataset.⁹

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value.

The evidence reported in Map 4.2 (on the left) mirrors the heterogeneity of the regions included within the Programme Area. The highest values of the composite indicator are concentrated in Northern Italy, and in particular in the regions of Udine, Pordenone, Venezia and Padova. Moving towards the south of the peninsula, the values progressively decrease, with the exceptions of Forlì-Cesena, Ascoli Piceno and, in southern Italy, of Bari. This diversity reflects the different vocations of the regions included on the Italian side of the Programme

⁸ tgs00041

⁹ nama_10r_3empers K_M & M_N

Area. Some of them are characterized by the presence of large cities, hosting universities and research institutions and specialized in relatively advanced sectors. Other regions are more rural, with a specialization in traditional sectors and, as a consequence, a lower level of human capital in knowledge intensive areas.

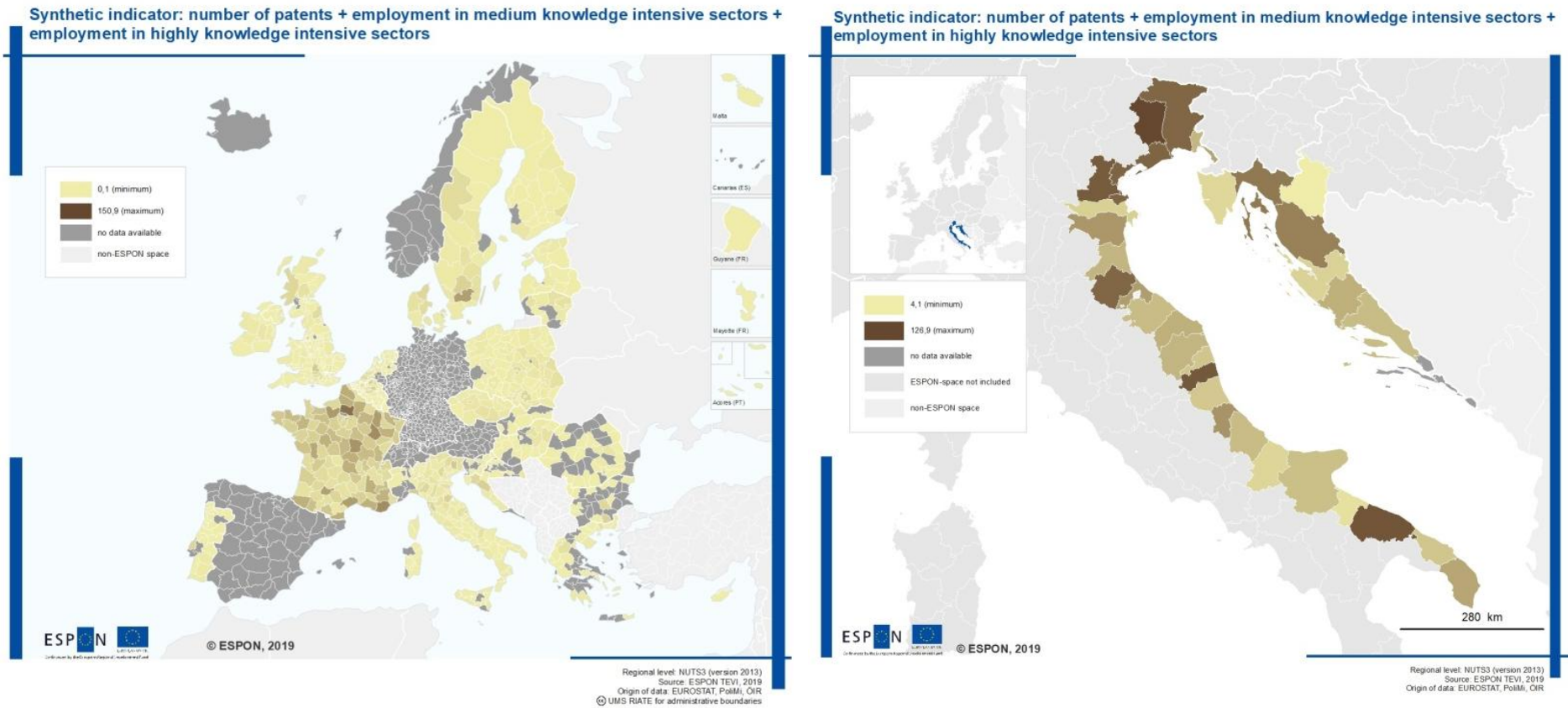
A similar evidence characterizes the Croatian regions included within the Programme Area. The highest values of the composite indicator are those of the regions of Primorsko-goranska and Ličko-senjska, whose values are nevertheless lower than the best performers on the Italian side of the border. The other Croatian regions are characterized by a relatively low level of human capital in knowledge intensive areas.

As for the previous composite indicator, also in this case the comparison with the rest of the EU29 (Map 4.2 on the right) shows a relatively poor performance of the Italian-Croatian regions.

Based on this evidence, the cooperation strategy identified innovation as a tool for enhancing SMEs competitiveness. In particular, the focus of the Programme is on the blue economy and on some related business niches (tourism, creative industries, fisheries and aquaculture).

Rather than developing new sectors, the orientation of the Programme is to increase the efficiency and the potential in the use of several traditional assets and competences of the area, like for instance the experience in shipbuilding. Also, it emerged the need for the development of skills and human resources complementary to these activities, in order to meet the demand from SMEs that, at present, is only partially covered by the supply of the local job market.

Map 4.2: Synthetic indicator: Number of patents + employment in medium knowledge intensive sectors + employment in highly knowledge intensive sectors



4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies the developments in tourism and sustainability in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations. The indicator stems from Eurostat and is available in monthly intervals at national level¹⁰. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹¹ is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹². This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator.

As far as the Italian regions of the Programme Area are involved (Map 4.3 on the left), a clear divide between the northern and the southern part of the peninsula is clearly visible. In the North, the region of Venezia represents an outlier, given its outstanding sites and number of tourists every year. Also the other areas around, however, show a relatively high value of the indicator. From Trieste in the North-East until Ascoli Piceno in the Centre, all Italian regions

¹⁰ tour_occ_nim

¹¹ Source: EEA, DG REGIO

¹² tour_occ_anor2

on the Adriatic coast are characterized by a high attractiveness of tourism, associated with a relevant endowment of natural sites. Moving further to the South, the value of the composite indicator decreases. Even if these areas, especially in the Apulia region, are popular tourist destinations, the high degrees of seasonality partially explain their low position in the ranking within the Programme Area.

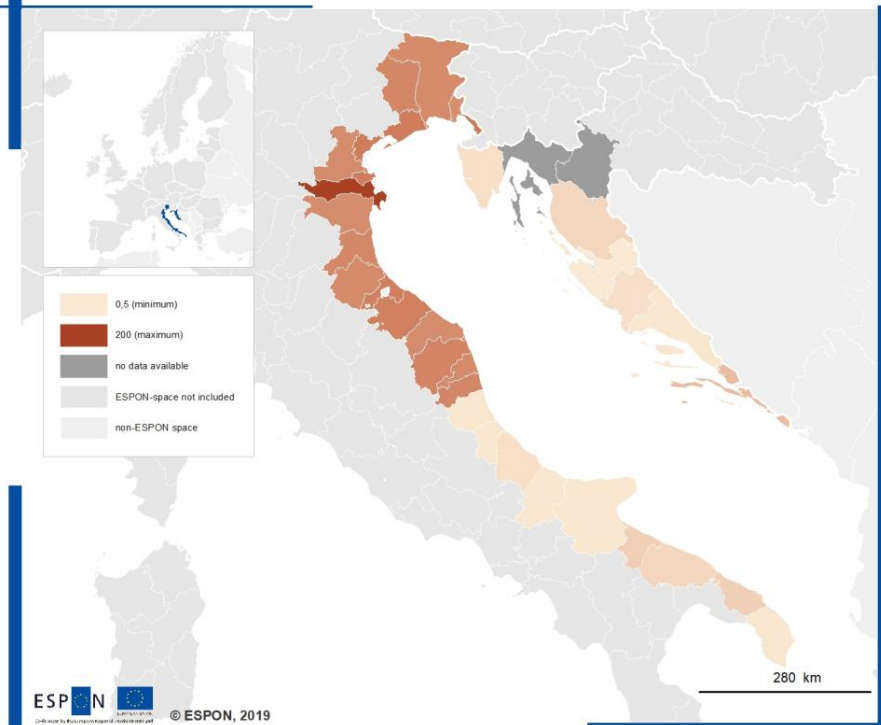
On the Croatian side, the values of the indicator for tourism and sustainability are similar to those observed in southern Italy, with the partial exception of the Dubrovačko-neretvanska region, characterized by slightly higher level. Again, these regions are attractive for tourism, which is however mostly concentrated in relatively short periods of the year.

Compared with the rest of the EU28 (Map 4.3 on the right), the relative positioning of the Programme Area, southern Italy and Croatia included, is rather positive. The performance of Venezia is among the highest ones in the whole continent. The other regions perform well if compared, for instance, with the rest of Italy and the other European regions with similar characteristics and tourist vocation.

The recognition of the natural environment as a crucial asset for the Programme Area, led the cooperation strategy to be focused on objectives that are likely to produce positive spillovers on the tourism sector. Within the Thematic Objective 06 (Preserving and protecting the environment and promoting resource efficiency), for instance, the aim is to restore and protect biodiversity, improving the environmental quality conditions of the sea and coastal areas. Within the Thematic Objective 07 (Promoting sustainable transport and removing bottlenecks in key network infrastructures), the goal of increasing maritime connections between the Italian and Croatian sides of the Adriatic Sea is associated to an improvement of the quality, safety and environmental sustainability of marine and coastal transport.

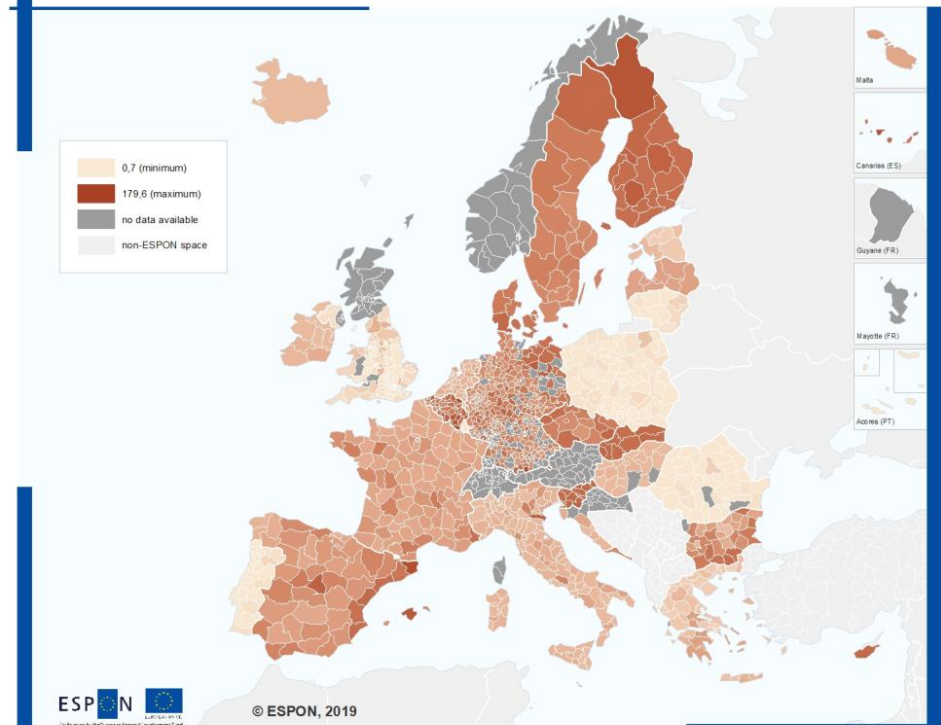
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Poitelli, CIR

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions

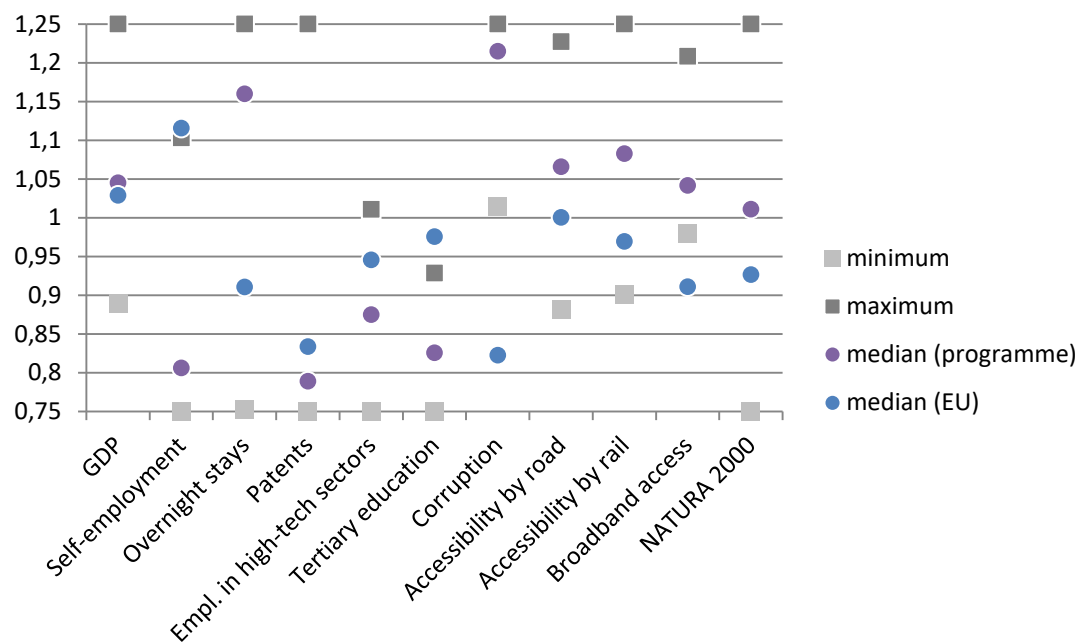


Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Poitelli, CIR
© UMS RIATE for administrative boundaries

4.4 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

Starting from the points of strength of the Programme Area, Figure 4.1 shows that this situation characterizes almost all the indicators related to tourism. The number of NATURA2000 sites and the number of overnight stays are in fact relatively higher than the EU28. It is important to note that, as pointed out in the previous section, the outstanding attractiveness of Venezia affects the range of variation of these indicators, which is rather high in Figure 4.1. Nevertheless, it does not influence the median value within the Programme Area, which is significantly higher than the rest of Europe. Once more, this evidence confirms that the natu-

ral and cultural capital of the Italian-Croatian regions represent a precious asset for future development. It is interesting to note that also the degree of accessibility, by both railway and road is higher than in the rest of the EU28. However, given the geography of the Programme Area, the accessibility within it (for instance moving from Italy to Croatia and vice versa) requires further investments, in order to intensify maritime connections, as pointed out by the Operational Programme. Finally, the level of broadband access is relatively high, and it is worth pointing out how even the worst performing region of the Programme Area scores better than the EU28 average.

Moving to the indicators in which the Italian-Croatian regions are performing worse than the rest of Europe, three variables require a particular attention, because none of the regions within the Programme Area is higher than the EU28 median. The most evident case is the one of the perceived level of corruption (the indicator has to be interpreted in the opposite way than the others, i.e. high values of the indicator have a negative interpretation). For this indicator, the best performer within the Programme Area (i.e. the region with the lowest value) is scoring worse than the EU28 average. Moreover, Figure 4.1. shows that the median of the Programme Area is much closer to the maximum than to the minimum value. This implies that one half of the regions have a performance, in terms of corruption, particularly high and close to the maximum value observed.

A similar situation concerns the indicator of tertiary education. Again the EU28 median is higher than the best performer of the Programme Area. In spite of the presence of several universities, this result reflects in part the long lasting processes of migration of high-skilled labour force from some of these regions (for instance those in southern Italy).

The last case in which the EU28 median outperforms (even if to a lower extent than the two previous indicators) all the regions of the Programme Area is the level of self-employment. The high range of values observed for the Italian-Croatian regions mirrors the heterogeneity of their level of entrepreneurship. Nevertheless, the fact that the median of the Programme Area is very close to the minimum value observed, warns about the high concentration of one half of the regions between these two values.

Taken together, these three indicators mirror serious issues that hamper the future development possibilities of the area, in particular after the severe effects of the global economic recession on local economies. Institutional quality and the availability of high-skilled labour force is in fact a pre-requisite for economic development.

Finally, the last two indicators show a situation in which part of the Programme Area is performing relatively worse than the EU28, and some regions relatively better. This is the case of patenting, where some areas achieve particularly high results. However, the median of the Programme Area is much closer to the minimum than to the maximum value, implying that one half of the regions are characterized by low levels of patenting. Also the level of employment in high-tech sectors is similar, even if in this case the distribution of the regions within

the Programme Area seems to be more homogeneous between the minimum and maximum values.

The need of further improving competitiveness, in particular enhancing innovation in specific business niches (tourism, creative industries, fisheries and aquaculture) was recognized by the Cooperation Programme.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

	Strengths	Weaknesses	Opportunities	Threats
Enhance the framework conditions for innovation in the relevant sectors of the blue economy	<p>Existing institutional setup for R&D Strong assets in identified blue economy sector</p> <p>Tradition and experience in shipbuilding</p> <p>Strong tradition and experience in fisheries with positive impact on national exports and employment in local communities</p> <p>SME sector density</p>	<p>Low level of competitiveness on international markets especially in traditional sectors and decrease of GDP</p> <p>Programme area GDP at 67% of EU28 with Croatian area at 42% of Italian</p> <p>GERD below EU28 (2.07%): Italy – 1.27%, Croatia 0.75% with high disparities among the regions</p> <p>N. of EPO patents below EU28, especially low on Croatian side</p> <p>Weak cooperation of scientific and real sector, especially SMEs</p>	<p>EU policies which fund cooperation between R&D institution and SMEs</p> <p>Available innovative sustainable technologies for the fishing sector</p> <p>Role of ICT in SME innovation, e-business growth, improved access to information and education in remote/rural areas.</p> <p>Aquaculture and shellfish farming as growing sectors</p> <p>Blue economy recognized by the EU policies and strategies as a key sector</p>	<p>Continuous economic crisis (also affecting manufacturing)</p> <p>Difficulties SMEs are facing in accessing financial instruments such as credits</p> <p>Lack of interest of entrepreneurs for R&D and innovation</p> <p>Continuous lack of investment of SMEs in innovation in the programme area</p> <p>Continuous lack of competitiveness of companies in shipbuilding</p> <p>Competition among stakeholders of the coastal area in key sectors as fishing, tourism</p> <p>Global competition on traditional manufacturing sectors and on tourism sectors</p>

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strengths	Weaknesses	Opportunities	Threats
Improve the climate change monitoring and planning of adaptation measures tackling specific effects, in the cooperation area	<p>Programme area/both countries participating in common and globally uniform ballast water management (BWM) approach.</p>	<p>Lack of low carbon development strategies and actions aiming at Kyoto protocol targets</p>	<p>Potential for joint capacity in management of coastal and marine resources</p>	<p>Growing trend of climate change effects and natural disasters in the Programme area</p>
Increase the safety of the Programme area from natural and man-made disaster	<p>Programme area/both countries participating in common and globally uniform ballast water management (BWM) approach.</p>	<p>Inefficient and fragmented waste management system</p>	<p>Potential for joint capacity in management of coastal and marine resources</p>	<p>Growing trend of climate change effects and natural disasters in the Programme area</p> <p>Increase of the Adriatic sea level forecasted</p>

	Strengths	Weaknesses	Opportunities	Threats
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	NATURA 2000 sites and other protected areas potential for tourism Rich cultural heritage as a potential for territorial development and growth	Seasonality of tourism and lack of sustainable solutions in some fields of touristic activity Traffic congestions in some parts of the area caused by seasonal tourism flows	Potential for joint capacity in management of coastal and marine resources	Increase of the Adriatic sea level forecasted
Contribute to protect and restore biodiversity	Adriatic sea offers good quality of water in relation to Mediterranean context	Existing of various forms of pollution and litter in the Adriatic Sea	Further preservation of biodiversity Joint risk management and prevention of damage caused by natural disasters	•Continuous pollution of the Adriatic Sea due to increased anthropic pressure
Improve the environmental quality conditions of the sea and coastal area by use of sustainable and innovative technologies and approaches	Favorable conditions for RES from solar and wind energy Good quality of air and water Adriatic sea offers good quality of water in relation to Mediterranean context	Lack of low carbon development strategies and actions aiming at Kyoto protocol targets Dependence on energy sources from abroad/import of gas and oil Limited funding and unused capacities of RES Existing of various forms of pollution and litter in the Adriatic Sea Traffic congestions in some parts of the area caused by seasonal tourism flows	Potential for joint capacity in management of coastal and marine resources Joint risk management and prevention of damage caused by natural disasters	Continuous pollution of the Adriatic Sea due to increased anthropic pressure Increase of the Adriatic sea level forecasted
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the programme area	Favorable conditions for RES from solar and wind energy	Lack of low carbon development strategies and actions aiming at Kyoto protocol targets Limited funding and unused capacities of RES Existing of various forms of pollution and litter in the Adriatic Sea	Potential for joint capacity in management of coastal and marine resources	Continuous pollution of the Adriatic Sea due to increased anthropic pressure Increase of the Adriatic sea level forecasted

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

	Strengths	Weaknesses	Opportunities	Threats
No specific TO focused on the Inclusive growth Strategy Pillar	<p>Tradition of mobility of workforce Croatia – Italy in Programme Area</p> <p>Strong network of educational institutions including universities</p> <p>Good accessibility to education and training</p> <p>Good experiences and long tradition of cooperation among local and regional governments in programme area</p>	<p>High unemployment rates in programme territory – higher in Croatia</p> <p>Youth as especially vulnerable unemployed group</p> <p>Education system does not match labour market needs</p> <p>Low rates of workforce with higher education</p> <p>Low level of adults attending LLL</p> <p>Increased % of population in risk of poverty in programme area</p>	<p>Good opportunities for and tradition in self-employment, especially in Italy</p> <p>Improved mobility of workforce in Programme area</p> <p>Specialization of workforce for specific business niches in Blue Growth</p>	<p>Growing trend in number of students exiting education process in Italy despite the fact that unemployment rates by education attainment are showing highest employment rates among persons with high/higher education</p> <p>Continuous growth of unemployed due to economic crisis</p> <p>Lack of responsiveness of educational sector to change and modernization</p> <p>Continuous growth of population in risk of poverty</p>

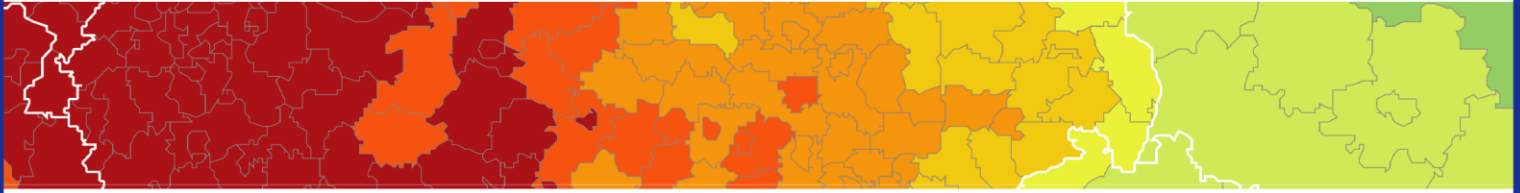
5.1.4 Main Challenge and Needs

Table 5.4: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	<p>Constant development of the blue economy based on constant R&D investments and dynamic SMEs</p>	<p>Underdeveloped cooperation between research centres and SMEs and limited internationalisation of local activities, which results in low competitiveness</p>	<p>Development of key economic sectors tapping on marine resources and source of local jobs creation.</p> <p>Improving accessibility and connection between rural and urban zones</p>	<p>Limited competitiveness due to an economy still struggling overcome the economic downturn. The limited support for SME scale up is likewise hindering the economic development and prosperity of the area.</p>
Sustainable growth	<p>Ideal position of the programme territory to develop innovative renewable energy solutions</p> <p>Large zones falling under NATURA 2000, which offers significant potentials for tourism development</p>	<p>The seasonality of numerous key sector (e.g. agriculture and tourism) hinders the resilience of the economic fabric. the pollution of fragile sites are damaging the environment</p>	<p>Joint risk management and cooperation activities are eased and facilitated by the geographical location of the territories. Natural resources management benefits from collaborative activities</p>	<p>Pollution remains a dire problem along with the impacts of climate change (e.g. rising sea level).</p>
Inclusive growth	<p>Large and well-functioning networks of universities</p>	<p>High unemployment rate, especially amongst young people</p>	<p>Long lasting entrepreneurial tradition that foster the development of start-ups</p>	<p>High rates of unemployment amongst people having achieved a higher education degree</p>

References

INTERREG IT-HR (2017) Cooperation programmes under the European territorial cooperation goal.



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

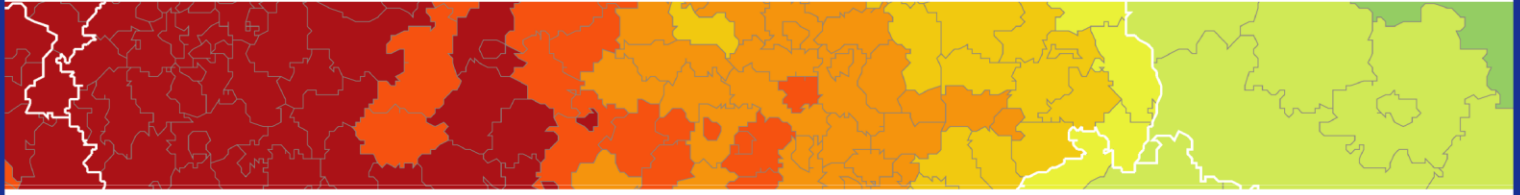
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Report

Territorial Evidence Report

INTERREG B Mediterranean

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2018

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG B Mediterranean

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview needs and challenges	3
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	4
3 Indicators	7
3.1 Initial result and output indicators used in assessment	7
3.2 Proposed Key Territorial Indicators.....	11
4 Benchmarking.....	15
4.1 Gross Value Added in Knowledge-Intensive Sectors	15
4.2 Human Capital in the Programme Area	18
4.3 Tourism and Sustainability.....	21
4.4 Regional Scoreboards.....	24
5 Reference Analysis	26
5.1 Territorial specificity of the programme area.....	26
5.1.1 Smart Growth	26
5.1.2 Sustainable Growth.....	27
5.1.3 Inclusive Growth	28
5.1.4 Main Challenge and Needs.....	29
References	31

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	7
Figure 4.1: Regional Scoreboard.....	24

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	14
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	14
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	17
Map 4.2: Synthetic indicator: Number of patents + employment in medium knowledge intensive sectors + employment in highly knowledge intensive sectors	20
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	23

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.	11
Table 5.1: SWOT Analysis Smart Growth	26
Table 5.2: SWOT Analysis Sustainable Growth.....	27
Table 5.3: SWOT Analysis Inclusive Growth.....	28
Table 5.4: SWOT Analysis Overall Challenges and Needs	29

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

The Interreg MED programme covers parts or the entirety of the following EU Member States: Greece, Spain, France, Croatia, Italy, Malta, Portugal, the United Kingdom, Cyprus and Slovenia. Additionally, Albania, Bosnia and Herzegovina, and Montenegro are also part of the MED programme. In total, the programme includes 57 regions from ten Member States and three candidate countries. The total budget of the programme for the 2014-2020 period is set at € 224,322,525 with co-funding from the ERDF.

The territory covered by the programme is geographically heterogeneous. The geographic characteristics are diverse: covering islands (e.g. Cyprus and Malta), but also several mountainous regions (such as part of the Alps). The geographic characteristics may pose an impediment factor to the accessibility of regions within the territory, as well as communication flows. The region possesses a wide range of natural resources, which greatly contribute to economic activities in the fields of tourism and agriculture, but are at-risk due to climate change.

The area eligible for the programme amounts to approximately 20% of the EU, or approximately 860,000 km². The MED territory covers around 122 million inhabitants, with a population density of on average 142 inhabitants per km². Average GDP per capita stood at € 21,776 at 2010, 12% lower than the EU average. Regional disparities are pronounced, with higher GDP per capita rates observed along the Northern Mediterranean Coast. Tourism remains a significant contributor to economic wealth in the MED region, attracting 18.5% of global tourists in 2012.

2.2 Contribution to EU 2020 strategy & situation in the programme area

The overall objective for the current programming period is to reduce the imbalance between the regions covered in the programme in terms of their economic, social, and territorial development, as well as their environmental sustainability. The MED programme contributes to the EU 2020 strategy pillar by promoting smart, sustainable, and inclusive growth in the MED region.

In terms of smart growth, promoting innovation and knowledge as a basis for economic growth, activities under Thematic Objective 1 aims to promote innovative activities in enterprises, especially in transnational innovative clusters. Activities under Thematic Objective 4 are designed to promote energy efficiency and a shift to low-carbon economic activities, which contribute to the sustainable growth pillar. In addition activities under Thematic Objective 6 contribute to sustainable growth by promoting sustainable development of tourism and safeguarding biodiversity. Contributions to inclusive growth are also found under Thematic Objective 1, in which social innovations are promoted.

2.3 Overview needs and challenges

Under smart growth, the programme area features strengths, such as: some regional leaders in R&D and some high skill industry sectors, a relatively wide coverage of high-speed broadband, and the attractiveness of the region, which is a positive aspect for SMEs in the tourism sector. As weaknesses, a relatively lower average GDP per capita, strong influences of traditional business, wide regional disparities, and a limited understanding of intellectual property, are identified. One of the key opportunities are rising investments in R&D and R&D specialisation of agribusinesses. The most significant threat outlined under this strategy pillar is the economic consequences of the economic and debt crisis. The main challenges to the region are stemming from increasing competition from countries outside of the region and relatively lower innovation levels. As needs, stronger investments in R&D and a need to improve the competitiveness of businesses are identified.

Under sustainable growth, major strengths are favourable conditions for the production of renewable energy and many protected environmental areas. Significant weaknesses are a relatively high concentration of ozone, high energy dependence, a high susceptibility to climate change, and the degradation of fragile areas. An opportunity is the development of renewable energy sources, which are not fully exploited. Significant threats are outlined as an increase in the cost of low carbon energy, an increased risk of natural disasters due to climate change, and a risk of environmental pollution due to tourism and agricultural activities. Main challenges include the consequences of climate change and the increasing scarcity of water. Improving the toughness of coastal areas and the environment to consequences of climate change, as well as the reduction of marine pollution and litter, are identified as needs.

Under the strategy pillar inclusive growth, major strengths are identified as the attractiveness of universities in the MED area, descending intergenerational solidarity, and the availability of high quality and free training. However, as weaknesses, low employment levels, a relatively large percentage of the population at risk of social exclusion, and high levels of early-school leavers, are identified. An opportunity is increasing interregional and inter-country labour mobility. The identified threats are stemming from the financial crisis, e.g. strong unemployment and drain of human capital. The consequences of demographic change on the economy and the rising difficulties of socio-economic integration of young people are listed as main challenges. Social innovation in key economic sectors needs to be promoted.

The most important thematic fields are strengthening research and development, supporting a shift to a low-carbon economy, preserving the environment, and enhancing Mediterranean governance.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1b: To increase transnational activity of innovative clusters and networks of key sectors of the MED area

Priority Axis 1: Promoting Mediterranean innovation capacities to develop smart and sustainable growth (TO1, IP 1b)

- *Brief justification:* The specific objective takes advantage of the specific resources of the MED area to promote innovation, via improving and strengthening innovative clusters and networks in the areas of green and blue growth. A focus lies on promoting eco-innovations. This is in-line with the challenges identified for the MED region, namely, relatively low innovation capabilities and threats to the environment via pollution
- *Main change sought:* Strengthen and empower innovation clusters and networks
- *Expected activities:* Design of common transnational strategies and approaches (including studies and innovation simulations), testing of pilot activities (e.g. public policies aimed at bolstering innovation, voucher systems), and activities involving transfer, dissemination, and capitalisation (e.g. capacity building, creation of sustainable networks, upscaling of pilot initiatives)
- *Beneficiaries:* The main target groups are local, regional, and national authorities, SMEs and economic operators, universities and research centres, and civil society. Other beneficiaries include regional development agencies, business support centres, chambers of commerce, and public bodies (or equivalents) involved in innovation-related activities, industrial policy, and SMEs and training.

Specific objective 4c: To raise capacity for better management of energy in public buildings at transnational level

Priority Axis 2: Fostering low-carbon strategies and energy efficiency in specific MED territories, cities, islands and rural areas TO4, IP 4c)

- *Brief justification:* The specific objectives 4c directly addresses the weaknesses identified in the SWOT analysis, by improving energy efficiency and thereby reducing dependency via reduced energy consumption.
- *Main change sought:* Increase capacity of owners and managers of public buildings to implement energy efficient practices.
- *Expected activities:* common approaches and strategies (e.g. harmonisation of standards, strategies and approaches of energy efficiency management), pilot demonstration activities (including feasibility studies, new management approaches), and activities involving transfer, dissemination, and capitalisation (e.g. upscaling of projects, capacity building, and implementation of public policies for improved energy consumption management)
- *Beneficiaries:* Beneficiaries include public authorities (including authorities dealing with energy issues), energy agencies, research institutes, universities, as well as energy suppliers (public and private), and relevant associations

Specific objective 4e: To increase the share of renewable local energy sources in energy mix strategies and plans in specific MED territories

Specific objective 4e: To increase capacity to use existing low carbon transport systems and multimodal connections among them.

Priority Axis 2: Fostering low-carbon strategies and energy efficiency in specific MED territories, cities, islands and rural areas TO4, IP 4e)

- *Brief justification:* By increasing the share of renewable energy sources in the energy mix strategies, the specific objective addresses a key issue identified in the SWOT analysis, namely, reducing energy dependence.
- *Main change sought:* Increased development of local renewable energy sources.
- *Expected activities:* common approaches and strategies (e.g. harmonisation of standards, strategies and approaches of energy efficiency management), pilot demonstration activities (including feasibility studies, new management approaches), and activities involving transfer, dissemination, and capitalisation (e.g. upscaling of projects, capacity building, and implementation of public policies for improved energy consumption management)
- *Beneficiaries:* Beneficiaries include public authorities (including authorities dealing with energy issues, transport, and mobility management), energy agencies, research institutes active in energy and mobility issues, NGOs, Public and private operators, transport organisations/companies (public and private), developers and providers of transport organisation.

Specific objective 6c: To enhance the development of a sustainable and responsible coastal and maritime tourism in the MED area

Priority Axis 3: Protecting and promoting Mediterranean natural and cultural resources TO6, IP 6c)

- *Brief justification:* Priority Axis 3 is seeking to protect and maintain biodiversity and ecosystems in the MED area, and develop sustainable and responsible tourism in coastal and maritime areas. With the degradation of coastal areas identified in the SWOT analysis, the specific objectives 6c and 6e directly aim to address this weakness.
- *Main change sought:* Improvements in e.g. coastal zone management and maritime spatial planning policies to bolster cooperation strategies and joint policies.
- *Expected activities:* common approaches and strategies (e.g. studies and analyses, data gathering and monitoring, development of innovative strategies of tourism development), pilot demonstration activities (e.g. tools assessing the issue of seasonality, management of coastal tourist destinations), and activities involving transfer, dissemination, and capitalisation (e.g. upscaling of projects, enhancing governance principles)
- *Beneficiaries:* Types of beneficiaries include public authorities, regional development agencies, environment agencies, tourism agencies and organisations, university and research centres, and economic operators

Specific objective 6d To maintain biodiversity and natural ecosystems through strengthening the management and networking of protected areas

Priority Axis 3: Protecting and promoting Mediterranean natural and cultural resources TO6, IP 6d)

- *Brief justification:* Priority Axis 3 is seeking to protect and maintain biodiversity and ecosystems in the MED area, and develop sustainable and responsible tourism in coastal

and maritime areas. With the degradation of coastal areas identified in the SWOT analysis, the specific objectives 6c and 6e directly aim to address this weakness.

- *Main change sought:* Strengthening of management and cooperation between protected areas.
- *Expected activities:* common approaches and strategies (e.g. development of information services and protection plans), pilot demonstration activities (e.g. testing of public policies and innovative technologies), and activities involving transfer, dissemination, and capitalisation (e.g. awareness-raising of the population and decision-makers, transfer of scientific knowledge to decision-makers)
- *Beneficiaries:* Environment departments of public authorities, environment agencies, regional development agencies, protected areas management organisations, intermediary bodies, research centres, economic operators, local community associations

Specific objective 11 To maintain biodiversity and natural ecosystems through strengthening the management and networking of protected areas

Priority Axis 4: To support the process of strengthening and developing multilateral coordination frameworks in the Mediterranean for joint responses to common challenges TO11, IP 11)

- *Brief justification:* Priority Axis 4 seeks to improve Mediterranean governance by setting up new multilateral coordination frameworks and improving on existing one. As the political, geographical, and economic factors vary from region to region, new multilateral governance processes can improve the capability of the region for joint responses to common challenges.
- *Main change sought:* Setting up of a joint governance process.
- *Expected activities:* knowledge management (via e.g. studies and consultation processes) and networking and strategy building (via e.g. the drafting of integrated approaches, the setting up of working groups, and support to macro-regional and sea basin strategic cooperation).
- *Beneficiaries:* The main types of beneficiaries are European, national, regional, and local authorities, research centres, decision-makers

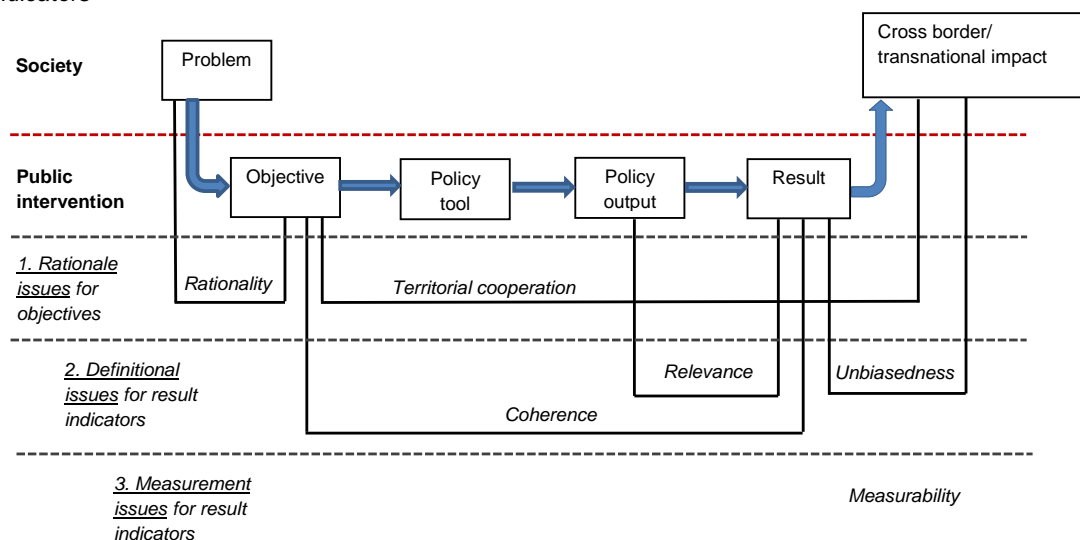
Programme cooperation: Interregional working groups (composed of managing authorities), targeting capitalisation potentials between programmes under the auspices of MED and regional ERDF/ESF/EARDF programmes. Synergies are expected between other non ESIF instruments, as the MED project can contribute to finance projects, where thematic objectives overlap.

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
1	To increase transnational activity of innovative clusters and networks of key sectors of the MED area	Share of innovative clusters (i.e. including RDI activities) offering to their members a consolidated mix of transnational activities in key sectors of the MED area (Innovative clusters (%))	HIGH	HIGH	HIGH	MEDIUM - The share of innovative clusters could capture an outcome of the Programme	HIGH	LOW - if not provided by official statistics, the definition of cluster could be sensitive to subjectivity issues
4	To raise capacity for better management of energy in public buildings at transnational level	Share of regional, sub-regional and local energy efficiency plans including adapted measures for public building stock (Regional plans (%))	HIGH	MEDIUM - It is not clear how transnational synergy can contribute to the achievement of the objective	HIGH	HIGH	HIGH	LOW - Different administrative definitions across countries could prevent any comparison also within the Programme area
4	To increase the share of renewable local energy sources in energy mix strategies and plans in specific MED territories	Share of renewable energy from local sources in energy mix of MED islands and rural areas (% of local RES in the energy mix of islands)	HIGH	MEDIUM - It is not clear how transnational synergy can contribute to the achievement of the objective	HIGH	HIGH	LOW - The indicator could be influenced by exogenous changes in the energy market, availability of renewable-energy sources	MEDIUM - if not provided by official statistics, the data could be collected at a high cost. Comparability could be prevented by different energy classifications across countries
4	To increase the share of renewable local energy sources in energy mix strategies and plans in specific MED territories	Share of renewable energy from local sources, in energy mix of MED islands and rural areas (% of local RES in the energy mix of rural areas)	HIGH	MEDIUM - It is not clear how transnational synergy can contribute to the achievement of the objective	HIGH	HIGH	MEDIUM - The indicator could be influenced by exogenous changes in the energy market	MEDIUM - if not provided by official statistics, the data could be collected at a high cost. Comparability could be prevented by different energy classifications across countries
4	To increase capacity to use existing low carbon transport systems and multimodal connections among them	Share of urban plans which include low carbon transport and multimodal connection soft actions (Plans providing soft actions oriented towards sustainable transport (%))	HIGH	HIGH	MEDIUM - Urban transport as a weak transnational dimension	HIGH	HIGH	LOW - Different administrative definitions across countries could prevent any comparison also within the Programme area
6	To enhance the development of a sustainable and responsible coastal and maritime tourism in the MED area	Level of sustainability of tourism in MED coastal regions ((%))	HIGH	MEDIUM - It is not clear how transnational synergy can contribute to the achievement of the objective	LOW - It is not clear how "sustainability" is defined	HIGH	LOW - Other factors could impact the sustainability of tourism (e.g. less tourism presences)	LOW - A homogeneous definition of sustainability must be found. Comparability is limited with other areas.
6	To maintain biodiversity and natural ecosystems through strengthening the management and networking of protected areas	Share of protected areas meeting their conservation goals and objectives (thanks to their improved management) (Land based Natura 2000 sites (%))	HIGH	HIGH	HIGH	HIGH	HIGH - If the specification "thanks to their improved management" is empirically verified	MEDIUM - Comparability depends on the availability of homogeneous statistics across countries
6	To maintain biodiversity and natural ecosystems through strengthening the management and networking of protected areas	Share of protected areas meeting their conservation goals and objectives (thanks to their improved management) (Marine Protected Areas (%))	HIGH	HIGH	HIGH	HIGH	HIGH - If the specification "thanks to their improved management" is empirically verified	MEDIUM - Comparability depends on the availability of homogeneous statistics across countries
11	To support the process of strengthening and developing multilateral coordination frameworks in the Mediterranean for joint responses to common challenges	Number of joint thematic action plans allowing to implement coordinated strategic operations (Joint action plans (number))	LOW - It is not clear what challenges are included in this objective	HIGH	HIGH	LOW - The indicator captures an outcome more than a result	HIGH	LOW - Different administrative definitions across countries could prevent any comparison also within the Programme area

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

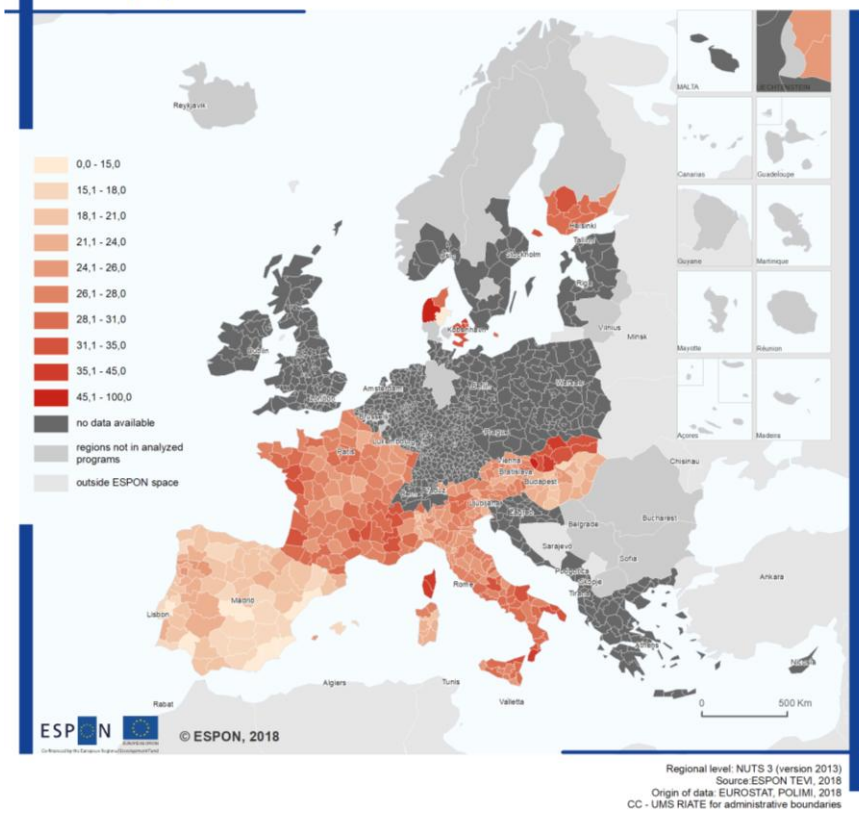
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

ETC objective	Thematic objective	Specific objective	Output indicator	Result indicator	Proposed result indicator
	1	To increase transnational activity of innovative clusters and networks of key sectors of the MED area	O1 : Number of operational instruments to favour innovation of SMEs (Instruments) O2 : Number of transnational innovation clusters supported (Clusters) CO1 : Number of enterprises receiving grants (Enterprises) CO2 : Number of enterprises receiving non-financial support (Enterprises)	Share of innovative clusters (i.e. including RDI activities) offering to their members a consolidated mix of transnational activities in key sectors of the MED area (Innovative clusters (%))	Number of FP projects with participation of local actors
	4	To raise capacity for better management of energy in public buildings at transnational level	O1 : Number of available planning tools to monitor and manage energy consumption in public buildings (Tools) O2 : Number of strategies supporting plans on energy consumption management for public buildings (Models) O3 : Number of target groups participating in capacity raising activities on energy efficiency for public buildings (Participants) O4 : Number of regions and sub-regions engaged (through charters, protocols, MoU) in developing energy efficiency plans/ strategies (Territories)	Share of regional, sub-regional and local energy efficiency plans including adapted measures for public building stock (Regional plans (%))	ISO 9000 documents of certification
	4	To increase capacity to use existing low carbon transport systems and multimodal connections among them	O1 : Number of instruments available to foster the use of LC transport solutions, including multimodal ones (Instruments) O2 : Number of models to develop urban plans including low carbon transport and multimodal connections soft actions (Models) O3 : Population involved in awareness raising activities (Population) O4 : Number of urban areas engaged (through charters, protocols, MoU) in developing urban plans/ strategies including low carbon transport and multimodal connection soft actions (Territories)	Share of urban plans which include low carbon transport and multimodal connection soft actions (Plans providing soft actions oriented towards sustainable transport (%))	CO2 emissions (to be controlled for other influential factors through DID)
	6	To enhance the development of a sustainable and responsible coastal and maritime tourism in the MED area	O1 : Number of instruments available to enhance the development of sustainable and responsible tourism (Instruments) O2 : Number of tourist destinations covered by a sustainable tourism evaluation tool (Tourist destinations) O3 : Number of strategies applying sustainable tourism management criteria (Strategies) O4 : Number of regions and sub-regions engaged (through charters, protocols, MoU) in implementing sustainable tourism plans (Territories)	Level of sustainability of tourism in MED coastal regions ((%))	Per capita number of Natura 2000 sites

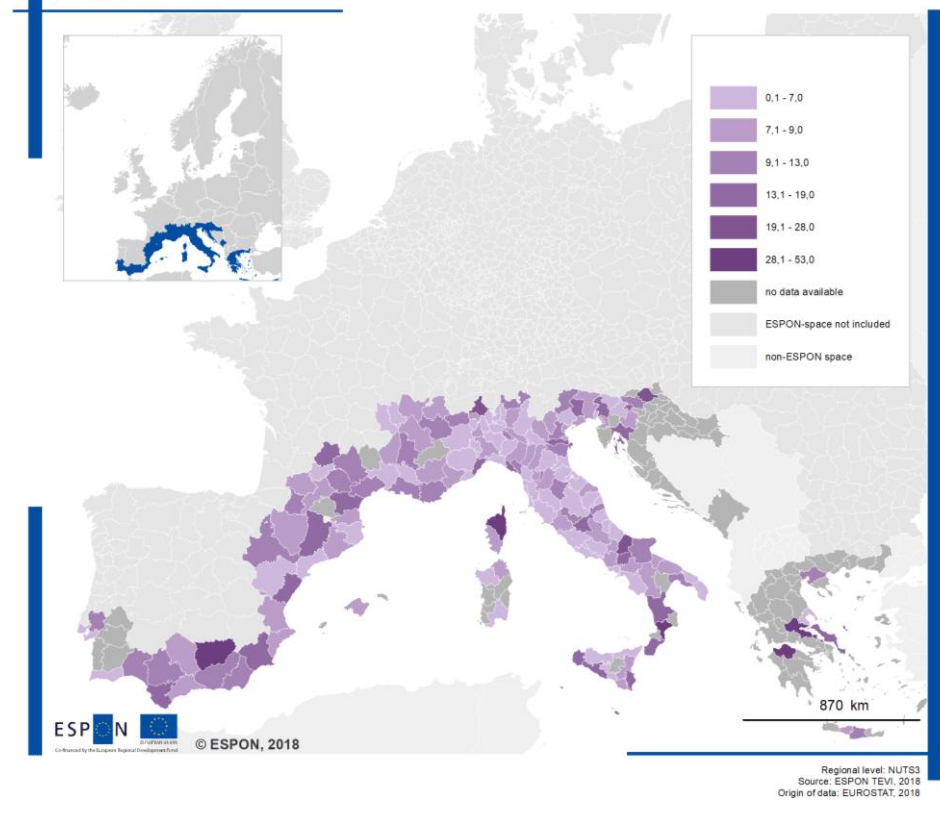
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)

Composite Indicator: patent applications + trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined timeperiod. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. In the programme context, a minimum of 0.1 can be observed in large parts of Italy, Greece Croatia and Slovenia. Maxima are found along urban centres, NUTS-3 regions around Barcelona, Rome and Milano; other well-performing regions are Rhône, Hautes-Pyrénées, Bouches-du-Rhone, Manotva, Rieti. This suggests that activities which result in higher indicator values are concentrated primarily in regions in which strong urban centres are located. Such regions contrast very much with other areas. In Slovenia, Croatia and Greece such well-performing regions are absent, suggesting that these countries do not have as strong performing regions in regards to GVA in knowledge intensive sectors. While in

⁶nama_10r_3gva

⁷nama_10r_3empers

the programme context there are some Slovenian and Croatian regions with a slightly darker shade, there is little indication for such regions in Greece. Generally, these moderately better performing regions are characterised by a higher degree of urbanisation, but this does not remain their sole defining characteristic.

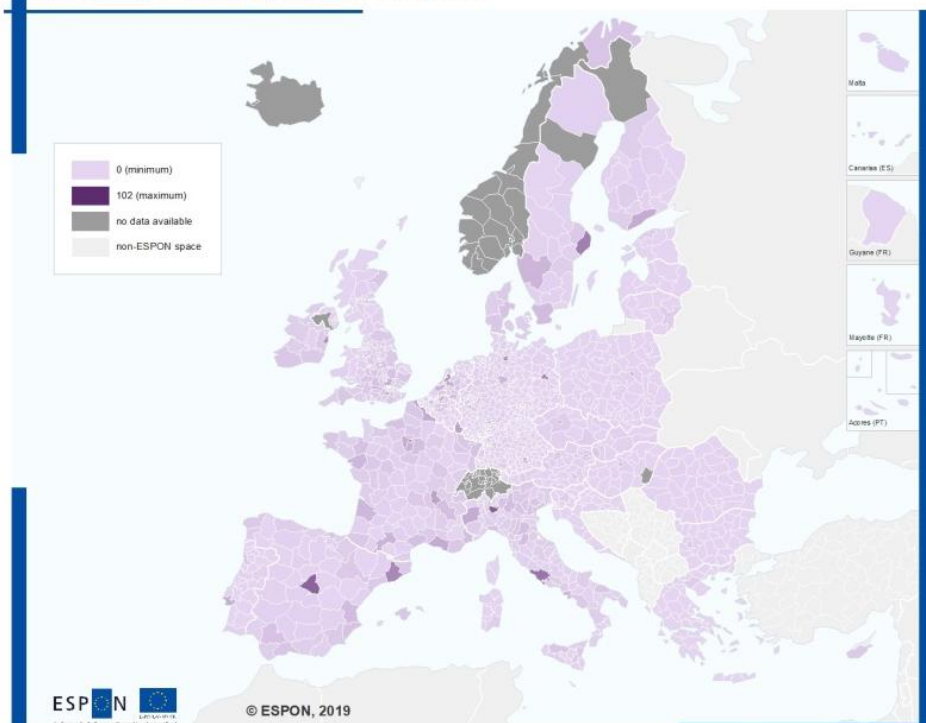
The urban-rural divide is also very visible in the case of Italian regions: the more densely populated North features several regional maxima located within clusters of moderately to well performing regions. Similarly, Rome features significantly better performance than Southern Italian regions. Rome, and many other major cities, however, are marked by a much stronger degree of centralisation in terms of GVA, with surrounding regions functioning as commuter belts with low performance.

Many well-performing regions retain its well-performing status also in the European context, these are Madrid, Barcelona, Milano and Rome. This means that such regions are strongest European players with regards to the indicator GVA in knowledge intensive sectors. Other, but not all, well-performing regions within the MED context can also be identified as well-performing in the European context: Bouches-du-Rhone, Alpes-Maritimes, Torino, Valencia, Hautes-Pyrénées and Rhône. This suggests that these regions are quite strong in the European context.

However, it should be noted that MED area is very large and heterogeneous in different aspects. As it includes a number of strong performers also in the European context, the less pronounced differences are not as visible even in the programme context. This makes it difficult to provide more detailed and specific statements regarding different regions. What is clearly observable is that the few strong performers in the European context are the MED regions with highest GVA in knowledge intensive sectors values. This also shows that many urban regions within MED do not offer a good start-up environment for knowledge intensive sectors as well as that such an environment can also be present in areas with smaller urban centres as the examples of French regions, Alpes-Maritimes, Hautes-Pyrénées as well as some Spanish and Italian regions show.

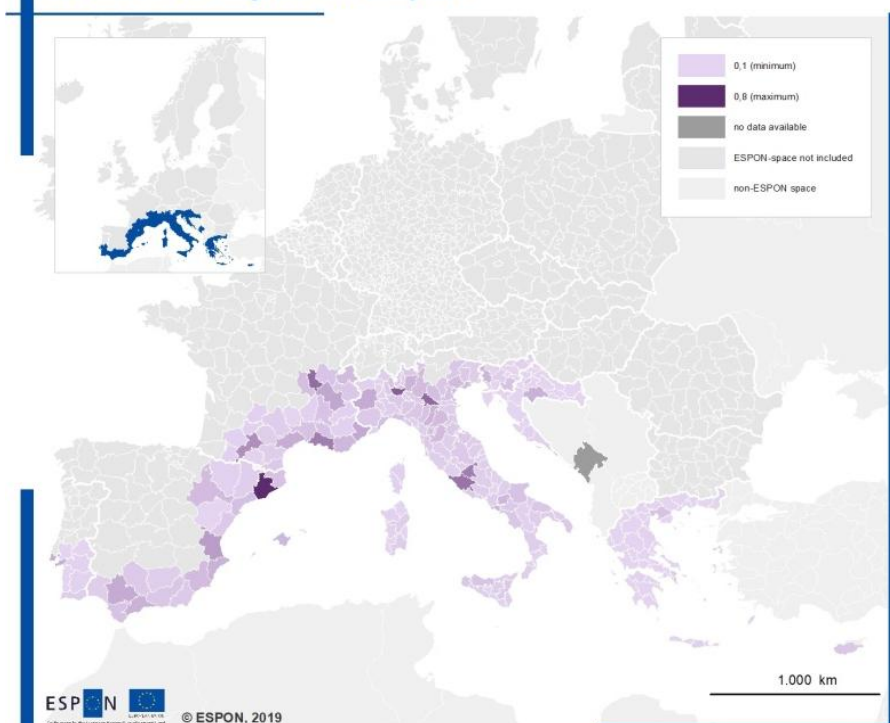
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR
 © UMS RIATE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR

4.2 Human Capital in the Programme Area

The maps below present the synthetic composite indicator *Human Capital in Knowledge-Intensive Areas* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Human capital refers to the stock of knowledge and abilities which are applied to produce goods and. The composite indicator reflects the stock of human capital and its distribution across the programme area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities and the necessary inputs. The indicator is calculated in the following manner:

$$HCAP_{i,t} = \frac{1}{3} * L_{i,t} + \frac{1}{3} * E_{i,t} + \frac{1}{3} * P_{i,t}$$

In which the variable $L_{i,t}$ represents overall normalised employment in medium knowledge intensive industries (e.g. financial and real estate services) in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment specifically in highly knowledge intensive industries (e.g. R&D) in a given region i and at time t . The variable $P_{i,t}$ represents registered patents per NUTS-3. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Data on employment in knowledge intensive sectors was obtained from the NACE dataset.⁹

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 0.5 can be observed, with corresponding maximum of 127.5. Minima are found in relatively rural areas in Southern Italy, Croatia and Greece. Maxima are found along urban centres in France, as well as in Northern Italy.

While there is some lacking data both within the programme and the European context, the available data shows a rather heterogeneous picture. Generally a North-West and South-East divide is observable with North-West having higher indicator values.

⁸ tgs00041

⁹ nama_10r_3empers K_M & M_N

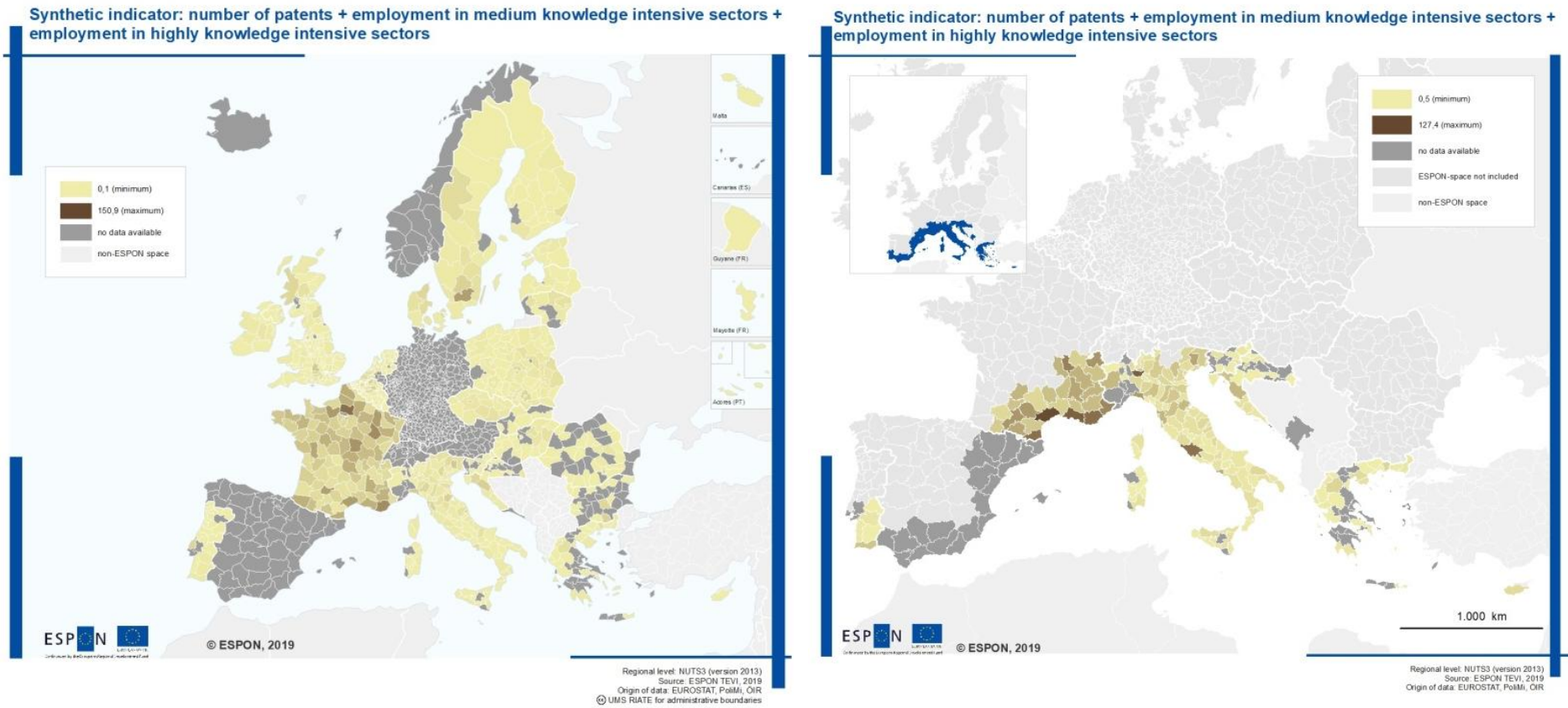
Higher values are found predominantly in French regions, especially coastal ones, as well as Rome, Milano and Corsica. Northern Italy and Croatia also has some regions with higher values. These regions are characterized by higher employment in medium- and high knowledge intensive industries combined with higher number of EPO applications. Regions with urban centres in France and Italy are especially pronounced in the maps. Interesting finding is the high value observable in Corsica which is primarily associated with tourism.

Within the European context, French regions retain their leading values while the Italian regions become less pronounced. This happens despite the fact that within the European context the regions which out-perform MED regions in terms of higher indicator values are located mostly in the northern part of France. The MED regions, thus, stand out in the European context in regards to the employment in medium- and high knowledge intensive industries combined with higher number of EPO applications.

Nevertheless, the heterogeneous situation also shows that Portuguese, Greek and Southern Italian regions have low indicator values both in programme as well as European context. This suggests lower values of combination of employment in medium- and high knowledge intensive industries with higher number of EPO applications.

A clear urban-rural divide can be observed in the maps below: urban centres along the French Mediterranean coast perform relatively, especially around the more densely populated area (Marseille). Capital cities fare also quite well, with Rome scoring a leading position within the programme area. These hotspots do not necessarily carry over onto the European context, where (with the exception of the French Mediterranean coast) the programme area performs in the European middle-field. Clusters of more densely populated regions (such as Northern Italy) are also outperforming their peers. While not regional featuring concentrated extrema, the regions perform well in the aggregate, with a homogeneous dispersion across several clusters.

Map 4.2: Synthetic indicator: Number of patents + employment in medium knowledge intensive sectors + employment in highly knowledge intensive sectors



4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies the developments in tourism and sustainability undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations and inverted. The indicator stems from Eurostat and is available in monthly intervals at national level¹⁰. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹¹ is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹². This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of one can be observed with corresponding maximum of 142.7. Minima are across Italy, Portugal and Croatia. . Maxima are found at the Spanish coast, in Slovenia ,parts of Greece and Cyprus.

There is a heterogeneity observable in the MED area between different countries. This suggests that combined tourism, seasonality and natural sites yield highest values in these countries, possibly that they have highest values in all of these indicators. In the programme area,

¹⁰ tour_occ_nim

¹¹ Source: EEA, DG REGIO

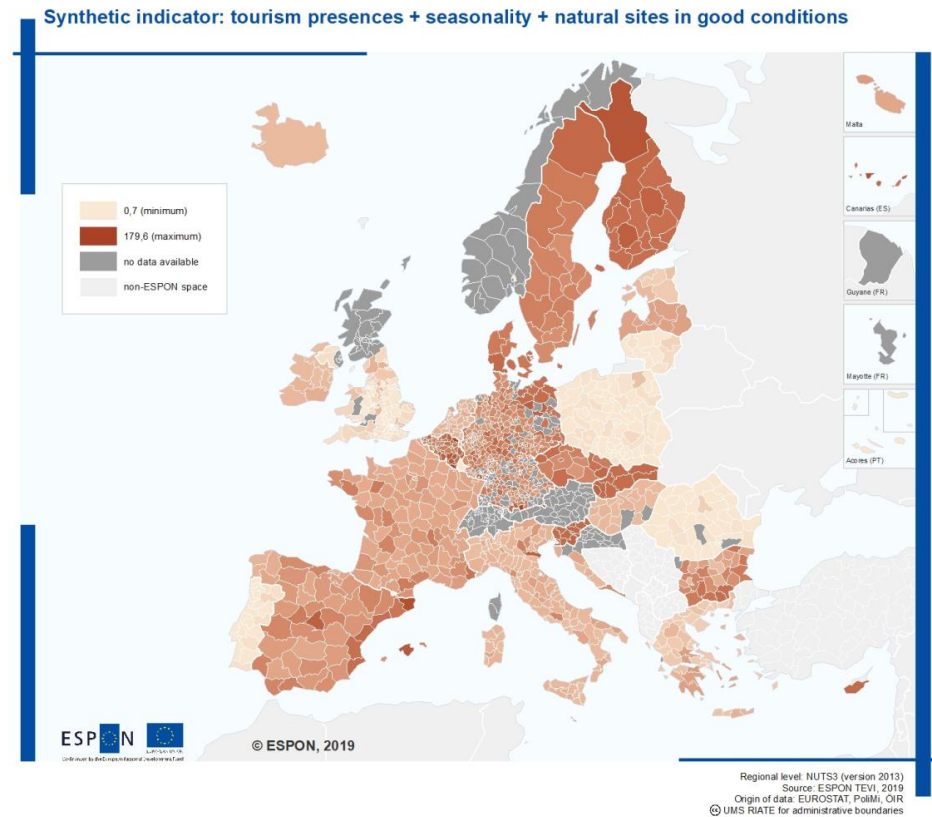
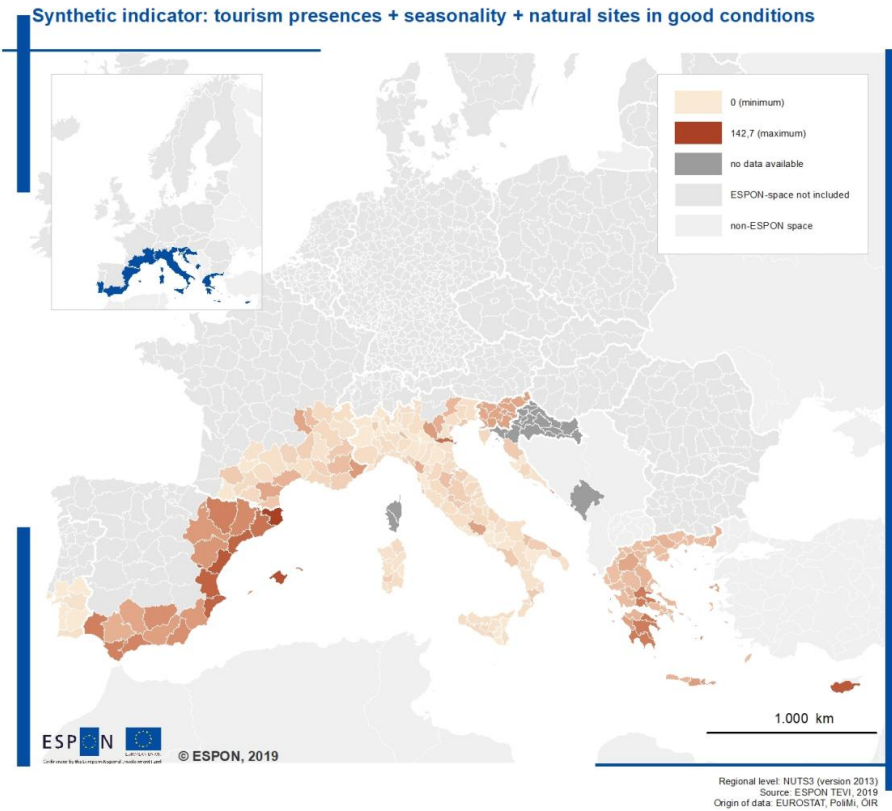
¹² tour_occ_anor2

Spain, Slovenia, Greece and Cyprus are generally homogeneously darker which indicates that all or most regions within these countries have high indicator values. France, Italy and Croatia have a higher range of values within their regions, however, very few reach highest values. It is an interesting observation that some countries have uniform range of values while others vary greatly between different regions.

In the overall picture of the European context, the MED regions become darker which means that their combined tourism, seasonality and natural sites synthetic indicator values are quite strong in European benchmarking. France, Italy, Slovenia and Croatia especially become more pronounced and Cyprus remains one of the countries with highest values. Nevertheless, there are many areas in Europe which have equally high or even higher values than MED which is characterized by many popular touristic destinations. Such areas are especially pronounced in Northern Europe (Sweden, Finland) as well as Central Europe (Germany, Slovakia, Czech Republic) values.

On European scale, several kinds of well performing regions can be identified: regions with predominantly low seasonality of tourism (e.g. regions within Belgium), regions with a large NATURA 2000 surface area in relation to their size (particularly Northern Sweden and Finland) and regions attracting a large degree of tourists (South-eastern Spain and Balearic Isles). Vice versa, there are also substantially many regions which may perform relatively well in one area (e.g. tourism), however, with a relatively low rating due to significant underperformance in other factors (e.g. concentrated seasonality around summer months). An example of this is Portugal. Most regions in the middle ground across Europe feature a combination of one of the factors outlined above with a relatively low rating in one of the other factors. An illustration of this phenomenon is Northern Italy, which boasts high popularity in terms of overnight stays, however, concentrated along summer months. The values of the synthetic indicator are low in Portugal, parts of France, Croatia and large portions of Italy. In the European context, Portugal retains its low values while values in Greece are lower as compared to the MED context. These, at first glance, counterintuitive scores can be distilled back to the composition of the indicator. Due to the inclusion of sub-components measuring the seasonality of tourism (its monthly variance across the year) and area of NATURA 2000 sites. A low score in either of the two components, either by low NATURA 2000 surface area in a given region (particularly relevant for Portugal and Greece) or a high seasonality.

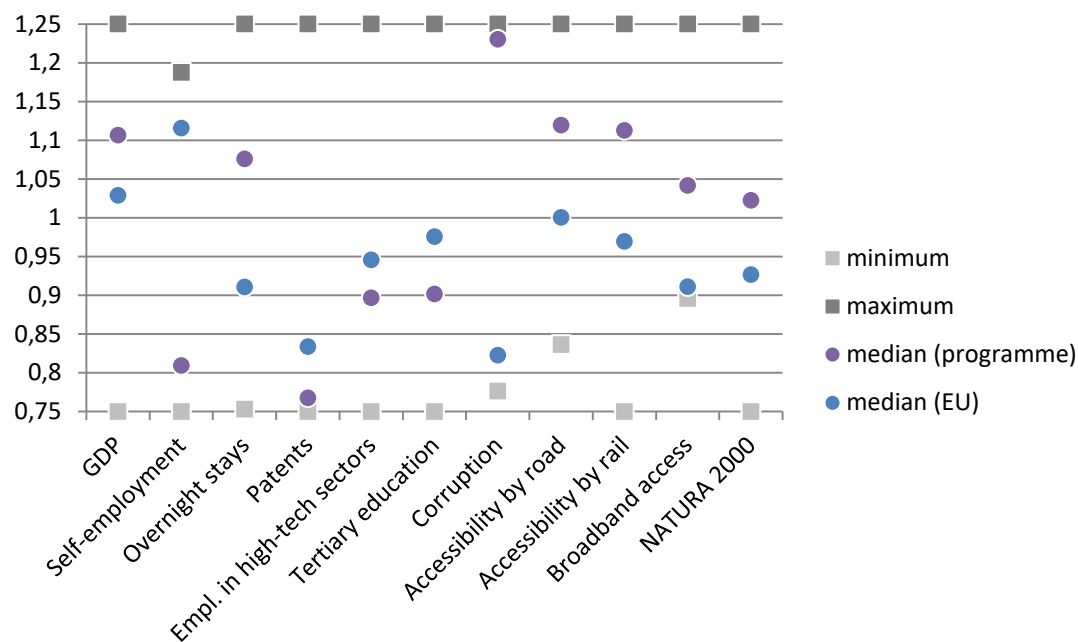
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions



4.4 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The results of the Scoreboard show considerable differences in indicator values for almost all indicators; the indicator with lowest difference across regions is broadband access. Given that the Programme Area is extensive and consists of many regions across Europe, this can be expected. The Mediterranean Programme Area performs relatively well; in case of most indicators its median values are higher than the EU median. Its median value in regards to perception of quality of governance in relation to corruption lies especially high as compared to EU value. Other areas where the programme has good performance relative to the EU are

NATURA 2000 Sites, overnight stays, and accessibility by road and rail which can be linked to the development of tourism in this Programme Area. In some cases, the Programme Area is performing worse than EU median, namely in high-technology outputs, such as patents and tertiary education.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

	Strengths	Weaknesses	Opportunities	Threats
Research, technological development and innovation	Sustained (and in most cases steadily increasing) levels of employment in technology and knowledge-intensive sectors, however with some disparities between regions ¹ .	GDP per capita increasing every year but still below EU average ² . Low investment in R&D compared with EU average ³ . Small proportion of persons employed in science and technology compared with EU average ⁴ .	Despite the economic crisis and budget constraints, sustained (and in most cases steadily increasing) levels of intramural R&D expenditure, however with strong disparities between regions and within countries ⁵ . Some leading regions in ESI funds dedicated to research, technological development and innovation: Andalusia (ES), Catalonia (ES), Campania (IT), Croatia, etc ⁶ .	Consequences of the economic crisis still to be perceived, especially in some hardly hit regions.
Information and communication technologies	High (and in most cases increasing) proportion of households with broadband access ⁷ . Increasing use of the Internet by individuals ⁸ .	Very limited use of the Internet for some online services (e.g. banking and selling goods/services) in some regions ⁹ .	Strong employment growth rate in the information and communication sector in the majority of the MED regions ¹⁰ . Some leading regions in ESI funds dedicated to ICT: Andalusia (ES), Campania (IT), Sicily (IT), Croatia, etc ¹¹ .	Significant inequalities between regions and territories in terms of ICT use.
Competitiveness of SMEs	Numerous cluster organisations (in particular in Catalonia, Andalusia, Rhône-Alpes, Emilia-Romagna, Continental Croatia, etc.) ¹² .	Wide regional disparities and regions with low competitiveness. Cyprus, Greece, Spain, Italy, Croatia and Portugal have not caught up with pre-crisis levels in terms of number of SMEs, SME employment and SME added value ¹³ .	High business birth rates in several MED regions (Portugal, Southern France, Spain, etc.) and positive net business population growth in some MED regions (namely Southern France) ¹⁴ . Some leading regions in ESI funds dedicated to SME competitiveness: Croatia, Puglia (IT), Sicily (IT), Andalusia (ES), etc ¹⁵ .	Slow recovery after the serious recession that affected the majority of the MED area.

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strengths	Weaknesses	Opportunities	Threats
Low carbon economy and energy sector	Favourable conditions for the production of renewable energy (climate, natural resources). Undergoing energy transition ¹⁶ , with an expected decrease in CO ₂ emissions between 2013 and 2040 ¹⁷ .	Under-developed (offshore) renewable energy production capacity.	Largely untapped potential for blue energy production, in particular offshore wind energy, with decreasing production costs ¹⁸ . Collaborative research and technology development initiatives between MED countries/regions ¹⁹ .	Increasing energy and natural resources demand fuelled by a fast-growing tourism industry in a business-as-usual scenario.
Climate change and risks	Existence of a European framework and national policies for the reduction of carbon emissions.	MED regions more susceptible to climate change than EU average ²⁰ . MED area strongly confronted to natural risks (e.g. floods, heat waves, droughts).	International initiatives to mitigate climate change ²¹ .	Increased risk of natural disasters and water scarcity due to climate change. High costs involved in repairing the damage caused by natural disasters.
Protection of the environment	Extremely rich environmental heritage (sea, mountains, arable lands, forests, rivers, wetlands, etc.). Many protected areas (NATURA 2000, areas of Mediterranean importance). Existence of regional strategic frameworks and collaborative projects for environment protection ²² .	Growing municipal waste production in many MED cities ²³ . Marine litter produced by heavy marine traffic, highly developed tourism industry and densely populated coastlines. High concentration of micro-plastics in the Mediterranean. Knowledge gaps on and insufficient solutions to mitigate the impacts of marine litter ²⁴ . Water pollution caused by cruise waste production and/or cruise ship sewage systems.	Development of environmental protection measures (protected areas...). Development of a Statistical Framework for Measuring Sustainable Tourism ²⁵ to better understand and assess the opportunities of sustainable tourism. Development of renewable energies. Potential to produce energy from marine litter. Potential for green shipbuilding, recycling and green ship powering ²⁶ .	Fragmented environmental strategies (need for more integrated measures between all EU and non-EU Mediterranean countries to address marine pollution) ²⁷ . Biodiversity threatened by the effects of climate change, marine litter, cargo discharge and overexploitation.
Transports	Good level of road and rail infrastructures ²⁸ . Large network of port cities well equipped to deal with the flow of passengers and goods. Strategic geographical location between East and West Europe and Africa. Good airport capac-	Geographical fragmentation and isolation of numerous territories (Islands, remote areas). Predominance of individual transports in urban and surrounding areas and low satisfaction with urban public transport ³⁰ . Some highly congested cities (Palermo, Marseille,	Good position of islands and MED regions as hubs for tourists and trade. Investment in rail (and multimodal) network development across the MED area, e.g. EU-funded TEN-T "Mediterranean Corridor" ³² . Overall increase in the maritime transport of freight ³³ (potential for boosting trade and	Mixed trends in terms of sea passenger transport, with some high-performing regions (e.g. Greek Macedonia, Malta, Balearic islands and Catalonia) and some "declining" regions (Attica ³⁴ , Southern Italy) ³⁵ .

	Strengths	Weaknesses	Opportunities	Threats
	ity attested by increasing air passengers flows ²⁹ .	Rome, Athens, etc.) ³¹ .	job creation).	

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

	Strengths	Weaknesses	Opportunities	Threats
Employment and labour mobility	Culture as a driver of employment ³⁶ , wide range of UNESCO World Heritage sites and many "European Capitals of Culture" cities ³⁷ . Accommodation and food services fuelling employment growth in recent years ³⁸ .	Very high unemployment rates compared to EU average ³⁹ . High long-term unemployment rates in many MED regions ⁴⁰ . Youth unemployment rates higher than pre-crisis levels in the majority of MED regions ⁴¹ . Growing levels of female unemployment (as a share of total unemployment) in most MED regions ⁴² .	Decreasing youth unemployment rates over the past few years ⁴³ . Strong demand for additional workforce in tourism, hence job creation potential both on land (e.g. hospitality) and in the sea (e.g. highly skilled workforce for private cruising) ⁴⁴ . Strong demand for workforce and development potential in some other maritime sectors such as marine aquaculture, fish processing, offshore wind and port activities ⁴⁵ .	Strong increase in unemployment as a result of the financial crisis still tangible, especially in Southern Italy and Greece. Drain of human resources, notably young people towards other EU countries, especially from Greece, Spain, Southern Italy, Croatia, Cyprus and Portugal ⁴⁶ . Some sectors threatened by climate change, such as agriculture (crop productivity potentially undermined by climate change).
Social inclusion and fight against poverty	Numerous organisations for intergenerational learning ⁴⁷ .	Proportion of people at risk of poverty or social exclusion extremely high in some regions (e.g. Sicily) ⁴⁸ . Severe material deprivation rates higher than pre-crisis levels in many MED regions (in particular Greece and Italy) ⁴⁹ .	Potential for more affordable tourism through sharing economy.	Massive immigration flows and humanitarian pressure, in particular from war-torn countries in the past few years ⁵⁰ .
Skills and education	High-ranking regions in terms of student mobility (Greece, Cyprus and Malta) ⁵¹ .	Higher rates of young people being neither in employment nor in education and training than EU average ⁵² . Higher rates of early leavers from education and training than EU average ⁵³ . A few MED countries with high percentages of low-achieving students in PISA subjects ⁵⁴ . Low adult participation in learning ⁵⁵ .	Progressive decrease in the rate of young people being neither in employment nor in education and training ⁵⁶ .	Wide disparities of education and training uptake across the MED area, with very low rates of leavers in e.g. Croatian and Slovenian regions and very high rates in e.g. Spanish and South-Italian regions ⁵⁷ .

5.1.4 Main Challenge and Needs

Table 5.4: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	A few regional leaders in R&D and high skill industry sectors	Relatively lower average GDP per capita and low levels of R&D investments	Untapped potential of the blue economy Some leading regions using ESI funds for research, technological development and innovation, ICT and SME competitiveness	Persisting effects of the economic crisis
Sustainable growth	Extremely rich environmental heritage with dedicated protection measures	Large amounts of municipal waste, marine litter and water pollution as a result of intensive tourism	Favourable conditions for the production of renewable energy	Tourism and agriculture threatened by climate change
Inclusive growth	Culture and cultural heritage as a driver of employment and economic growth	Many territories with geographic specificities (insularity, limited accessibility, vulnerability, etc.)	Strong demand for additional workforce in tourism and the maritime sectors, hence job creation potential both on land and in the sea	High youth unemployment rate, brain drain from some MED regions towards more economically attractive areas

The table above summarises the main strengths, weaknesses, opportunities and threats present in the programme area. A strong tourism economy, potential for sustainable energy production and developing cross-border transport networks are all important contributors to the success, strength and attractiveness of the region. There are however wide regional territorial and socio-economic disparities which challenge this potential for further economic growth.

Strengths

The MED programme area encompasses very attractive living environments with dry summers and mild winters, quality food and rich biodiversity fauna and flora. The programme area also benefits from affluent cultural heritage which altogether attracts very high number of tourists every year.

In addition, there are a few regional leaders in R&D and high skill industry sectors as well as numerous cluster organisations in e.g. Catalonia, Andalusia, Rhône-Alpes, Emilia-Romagna, and Continental Croatia.

Weaknesses

The main weaknesses of the programme area are 1) a strong exposure to mass tourism and climate change, with potentially devastating impacts for the local, regional and national economies, and 2) persisting effects of the economic and budgetary crisis, with lasting high unemployment rates (especially for young people) and weakened investment capacity for several regional and national governments.

Opportunities

Thanks to its many natural assets, the programme area is remarkably well placed to unlock the huge potential of renewable energy production and the blue economy more widely (e.g. coastal tourism, marine biotechnologies, offshore energy production).

Likewise, (sustainable) tourism and (sustainable) energy production, including from marine and coastal environments, are expected to generate large numbers of jobs and competitiveness advantages at international level.

Threats

Threats induced by climate change, mass tourism and fragile economies are pertaining to the whole programme area, however to a lesser or greater extent depending on the territorial and socio-economic context of the regions. Reducing the carbon footprint of the tourism and transport industries while achieving climate-resilient and carbon-neutral economies have been identified as key priorities to ensure the sustainability of both natural and socio-economic environments in the Mediterranean area¹³.

Finally, the low employment rate of younger generations observed in many MED regions and the consequent immigration of qualified youth towards Northern regions are also foreseen to pose problems for the long-term socio-economic development of the programme area. Investments in education, research, innovation and technological development are therefore crucial for addressing these multifaceted challenges.

¹³ WWF and BCG, *Reviving the economy of the Mediterranean Sea – Actions for a Sustainable Future*, WWF Report 2017, available at: http://awsassets.wwffr.panda.org/downloads/170927_rapport_reviving_mediterranean_sea_economy.pdf

References

Cooperation Programme 2014-2020 (2016). Interreg V-B Mediterranean. Version 2
Ex-Ante Evaluation (2014). Parcours L'Europe (via Interreg V-B Mediterranean).
Interreg MED 2016 Annual Report (2017). Interreg V-B Mediterranean. Version 2016.2

SWOT analysis

- ¹ Disparities ranging from a 1% decrease in PACA (FR) and Aosta Valley (IT) to a 16% increase in Malta. Source: Eurostat, change in employment levels in the technology and knowledge-intensive sectors over 2014-2017 (coverage: all EU MED NUTS 2 regions apart from UKZZ).
- ² Source: Eurostat, GDP/inhabitant of the MED region (all EU MED NUTS 2 regions apart from UKZZ) was 96% of EU average in 2010 and only 86% of EU average in 2016.
- ³ Source: Eurostat, intramural R&D expenditure (GERD) in Euro/inhabitant of the MED region lower than EU average, apart from some regions Southern France, Northern Italy and Slovenia (coverage: all EU MED regions apart from UKZZ, data from 2013-2015).
- ⁴ Source: Eurostat, Human Resources in Science and Technology as a percentage of total population lower than EU average, apart from some regions in Southern France, Lisbon metropolitan area, Lombardia and Slovenia (coverage: all EU MED regions apart from UKZZ, data from 2017).
- ⁵ Source: Eurostat, same as note 3.
- ⁶ Source: JRC Smart Specialisation platform, ESIF-viewer, visualising planned investments using European Structural and Investment Funds, ESI funds dedicated to the Thematic Objective (TO) 'Strengthening research, technological development and innovation'. Andalusia planned €1 billion for this TO over the 2014-2020 MFF period.
- ⁷ Source: Eurostat, (coverage: all EU MED regions apart from UKZZ, data from 2015-2017).
- ⁸ Source: Eurostat, between ca. 50 and 75% of individuals from the MED region (no data for UKZZ) were using the Internet on a daily basis in 2017.
- ⁹ Source: Eurostat (coverage: all EU MED regions apart from UKZZ, data from 2017).
- ¹⁰ Source: Eurostat, SBS statistics (data gaps: France, Malta, Cyprus and Slovenia), data from 2016.
- ¹¹ Source: JRC Smart Specialisation platform, ESIF-viewer, visualising planned investments using European Structural and Investment Funds, ESI funds dedicated to the Thematic Objective (TO) 'Enhancing access to, and use and quality of, ICT'. Andalusia planned €410 million for this TO over the 2014-2020 MFF period.
- ¹² Source: www.clustercollaboration.eu
- ¹³ European Commission, Annual Report on European SMEs 2016/2017, p.29. Data on SME performance from 2016, pre-crisis data from 2008/2009.
- ¹⁴ Source: Eurostat, business demography (data gaps: Greece, Malta, Cyprus and Slovenia), data from 2014-2015.
- ¹⁵ Source: JRC Smart Specialisation platform, ESIF-viewer, visualising planned investments using European Structural and Investment Funds, ESI funds dedicated to the Thematic Objective (TO) 'Enhancing the competitiveness of SMEs, of the agricultural sector (for the EAFRD) and of the fishery and aquaculture sector (for the EMFF)'. Croatia planned €978 million for this TO over the 2014-2020 MFF period.
- ¹⁶ OME, MEDENER, Ademe, Mediterranean energy transition 2040 scenario, Executive Summary, 2016, p.6.
- ¹⁷ Source: Observatoire Méditerranéen de l'Énergie, GEM No.15, November 2016, p.29. Expected 19% decrease in CO2 emissions in North Mediterranean countries (Cyprus, France, Greece, Italy, Malta, Portugal, Slovenia, Spain, Albania, Bosnia Herzegovina, Croatia, Macedonia, Montenegro and Serbia) between 2013 and 2040 (conservative scenario), and even more significant decrease in a energy transition scenario.
- ¹⁸ UfM, *Blue Economy in the Mediterranean*, 2017, p.52, p.58.
- ¹⁹ E.g. BlueNET, UfM Platform on Renewable Energy and Energy Efficiency.

-
- ²⁰ UfM, *Key players' perspective on climate change in the Mediterranean*, 2016, p.30.
- ²¹ E.g. Covenant of Mayors initiative on climate change, 2015.
- ²² E.g. Strategic Framework for the Management of Marine Litter in the Mediterranean 2012–2020 in 2012, European Union Strategy for the Adriatic and Ionian Region in 2014, etc.
- ²³ Source: Eurostat, Urban Audit, data from 2012-2016 (many data gaps).
- ²⁴ Source: *Report of BLUEMED Conference: A basin of research and innovation for sustainable growth held in Malta on 18-19 April 2017*, Panel 2.
- ²⁵ More info on the UNWTO website or here:
<http://cf.cdn.unwto.org/sites/all/files/docpdf/mstoverviewrev1.pdf>
- ²⁶ UfM, *Blue Economy in the Mediterranean*, 2017, p.49.
- ²⁷ Source: *Report of BLUEMED Conference: A basin of research and innovation for sustainable growth held in Malta on 18-19 April 2017*, Panel 2.
- ²⁸ Source: Eurostat, road and rail network in kilometres per thousand square kilometres, data from 2016.
- ²⁹ Source: Eurostat, increasing air transport of passengers between 2010, 2014 and 2016 in the vast majority of MED regions.
- ³⁰ Source: Eurostat, Urban Audit Perception Surveys 2015. High reliance on car for commuting journeys (combined with low use of public transport) in MED major cities such as Nicosia, Valletta, Verona, Irakleio and Palermo.
- ³¹ Source: TomTom Traffic Index, https://www.tomtom.com/en_gb/trafficindex/
- ³² More information on www.railfreightcorridor6.eu
- ³³ Source: Eurostat, maritime transport of freight (freight loaded and unloaded), data from 2010-2016 (data gaps).
- ³⁴ Though Attica remains a leading region in terms of sea passenger numbers in the MED area.
- ³⁵ Source: Eurostat, maritime transport of passengers, data from 2010-2016 (data gaps). High-performing regions showing steadily increasing passengers flows, declining regions showing steadily decreasing passenger trends.
- ³⁶ Source: Eurostat, cultural employment statistics, data from 2015-2017. In particular Cyprus, Greece and Slovenia have experienced a sustained increase in cultural employment in 2016 and 2017.
- ³⁷ Source: Eurostat, Culture Statistics, 2016 edition.
- ³⁸ Source: Eurostat, SBS statistics (data gaps: France and Slovenia), data from 2015 and 2016.
- ³⁹ Source: Eurostat, data from 2010-2017. Unemployment rates higher than EU average apart from Malta, Slovenia and Northern Italy.
- ⁴⁰ Source: Eurostat, data from 2017. Long-term unemployment rates higher than EU average in the vast majority of MED regions.
- ⁴¹ Source: Eurostat, data from 2008-2017.
- ⁴² Source: Eurostat, data from 2014-2017
- ⁴³ Source: Eurostat, data from 2014-2017. Decreasing youth unemployment rates in almost all MED regions.
- ⁴⁴ Source: *Report of BLUEMED Conference: A basin of research and innovation for sustainable growth held in Malta on 18-19 April 2017*, Panel 1.
- ⁴⁵ European Commission, ECORYS, *Towards an initiative for the sustainable development of the blue economy in the western Mediterranean*, September 2017 and UfM, *Blue Economy in the Mediterranean*, 2017, p.38.
- ⁴⁶ Source: Eurostat, the proportion of persons aged 15-34 has been decreasing faster in those regions than the EU average rate over 2014-2017.
- ⁴⁷ Source: European Map of Intergenerational Learning, www.emil-network.eu
- ⁴⁸ Source: Eurostat, data from 2017.
- ⁴⁹ Source: Eurostat, data from 2008-2017.

⁵⁰ Source: Eurostat, asylum applicants statistics. In 2016 and 2017, some MED countries (Greece, Spain, Croatia, Slovenia, Portugal and Italy) have seen a significant increase in numbers of asylum applicants compared to 2014, and in much larger proportions than EU average.

⁵¹ Source: European Commission, *Education and Training Monitor 2018* based on 2016 data on degree and credit outward mobility of graduates. Greece, Cyprus and Malta above-EU average mobility rates.

⁵² Source: Eurostat, higher rates of NEET people aged 15-24 in the vast majority of MED regions than EU average (exceptions include Slovenia, Malta, some regions of Portugal and France, and Aragon (ES)), data from 2017.

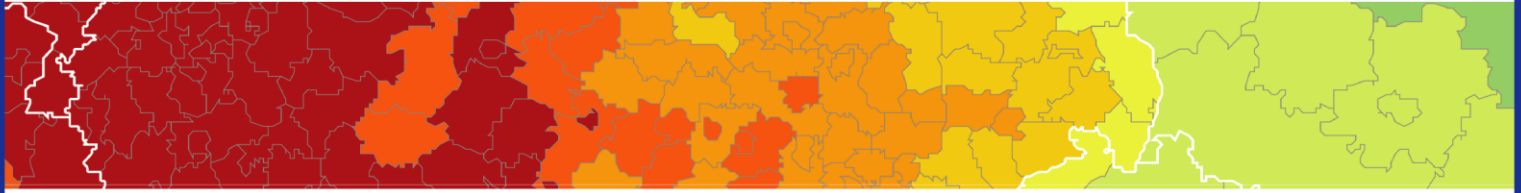
⁵³ Source: Eurostat, higher rates of people aged 18-24 leaving education and training early in the majority of MED regions than EU average, data from 2017 (data gaps).

⁵⁴ Source: European Commission, *Education and Training Monitor 2018* based on OECD, (2016) PISA 2015 results, p.49. Greece, Malta and Cyprus have above 20% of Percentage of low-achieving students in all three domains (science, reading and maths).

⁵⁵ Source: European Commission, *Education and Training Monitor 2018* based on 2017 data (adult participation in learning during the last 4 weeks age 25-64), p.64.

⁵⁶ Source: Eurostat, rate of NEET people aged 15-24, data from 2012-2017.

⁵⁷ Source: Eurostat, rates of people aged 18-24 leaving education and training early, data from 2017 (data gaps).



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

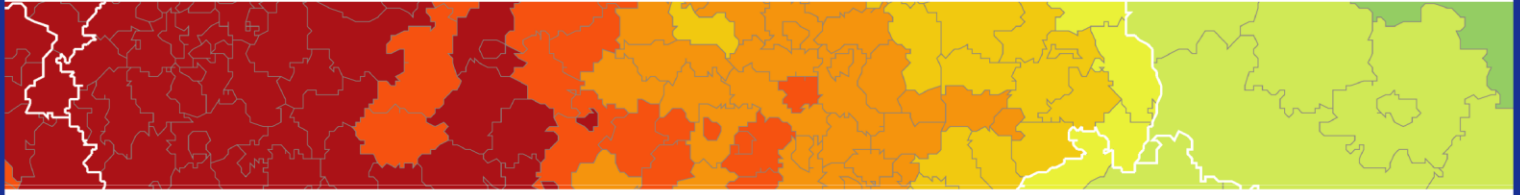
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG B North-West Europe

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG B North-West Europe

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	3
2.3 Overview needs and challenges	4
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	5
3 Indicators	9
3.1 Initial result and output indicators used in assessment	9
3.2 Proposed Key Territorial Indicators.....	13
4 Benchmarking.....	17
4.1 Gross Value Added in Knowledge-Intensive Sectors	17
4.2 Innovation.....	20
4.3 Tourism and Sustainability.....	23
4.4 Regional Scoreboards.....	26
5 Reference Analysis	27
5.1 Territorial specificity of the programme area.....	27
5.1.1 Smart Growth	27
5.1.2 Sustainable Growth.....	30
5.1.3 Inclusive Growth	35
5.1.4 Main Challenge and Needs.....	37

List of Figures

Figure 2.1: Programme area of the 2014-2020 Cooperation Programme INTERREG North-West Europe.....	2
Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	9
Figure 4.1: Regional Scoreboard.....	26

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	16
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	16
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	19
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors	22
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	25

List of Tables

Table 2.1: NWE Programme Specific Objective: Expected results and result indicator	8
Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.....	13
Table 5.1: SWOT Analysis Smart Growth	27
Table 5.2: SWOT Analysis Sustainable Growth.....	30
Table 5.3: SWOT Analysis Inclusive Growth.....	35
Table 5.4: SWOT Analysis Overall Challenges and Needs	37

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

Geographical location & territorial characteristics: The NWE Programme area has a population of about 180 million people living in the eligible area of 845 000 km². On one hand, it can be considered as one of the most dynamic and prosperous areas of Europe. On the other hand the area faces a number of environmental, social and economic needs and challenges.

According to the 2013 SWOT-analysis NWE comprises a number of the main metropolitan areas in Europe, which even play an important role in a worldwide perspective. Besides the global cities of London and Paris, major urban agglomerations stretch throughout North West Europe from Dublin and Greater Manchester, via London, large parts of Belgium and the Netherlands, major agglomerations areas along Ruhr and Rhine in Germany further to Switzerland. Furthermore, there are a large number of secondary growth poles. The high level of urbanity is both a strength but in particular in environmental terms also a challenge. Next to that and in spite of its general urban characteristic NWE also shows high levels of heterogeneity among its regions in light of an important number of performance indicators (accessibility; economic performance). Further, many of these differences seem to be increasing with time. As a result, one of the main challenges for transnational cooperation area is to manage excellence and diversity at once.

Countries involved, budget, Funds: The NWE Programme involves Ireland, the United Kingdom, Belgium, Luxembourg, Switzerland, and parts of France, Germany and the Netherlands. EU budget is € 372,366,282.00; total budget: € 620,610,471.00. Funds: ERDF) [keep.eu; accessed 18 April 2018].

Figure 2.1: Programme area of the 2014-2020 Cooperation Programme INTERREG North-West Europe.



Source: SUMMARY COOPERATION PROGRAMME INTERREG NORTH-WEST EUROPE 2014 – 2020.

2.2 Contribution to EU 2020 strategy & situation in the programme area

The overall ambition defined by the Member States for the NWE area is: “To be a key economic player in the world and create an attractive place to work and live, with high levels of innovation, sustainability and cohesion.” The strategy of the programme is not only evidence based but also policy based. The general relation between the programme and the three EU 2020 strategy pillars is as follows: “[I]t is evident that the selected set of TOs mainly addresses smart and sustainable growth [...]” (p.9). “[T]he Inclusive Growth dimension is integrated as a horizontal and cross-cutting issue within the selected TOs in order to promote the inclusion of vulnerable social groups and territories. Wherever relevant, it is incorporated in the Types of Actions (ToA) and the related project selection criteria.” (p.10).

The NWE Programme strategy places particular focus on four of the European Commission’s defined Thematic Objectives (TO)¹ (between brackets the relation with the EU 2020 strategy pillars):

- *TO 1*: strengthening research, technological development and innovation (Smart Growth);
- *TO 4*: supporting the shift towards a low carbon economy in all sectors (Sustainable Growth);
- *TO 6*: protecting the environment and promoting resource efficiency (Sustainable Growth);
- *TO 7*: promoting sustainable transport and removing bottlenecks in key network infrastructures (Sustainable Growth).

The contribution to the EU 2020 strategy pillars is explained as follows (p.16-17):

Smart Growth –The Programme will promote excellence and synergy by matching regional innovation approaches and connecting key clusters and innovation stakeholders in the NWE area; focuses on applied research and technological development activities close to the market, and market exploitation of new products, processes and services; aims at closing the gap between strong and weak(er) innovation regions.

Sustainable Growth – The Programme strategy contributes to reduced GHG emissions, increased energy efficiency and an increased share of renewable energy in the consumption and production mix, by stimulating eco-innovation and the development and uptake of low carbon technologies and transport systems. Also focuses on projects in the field of resource and materials efficiency.

Inclusive Growth – Transnational and territorial aspects of social inclusion may include removing barriers for a transnational labour market, as well as education, entrepreneurship education and pre-employment training. The Programme strategy also addresses energy accessibility and affordability and improving energy efficiency in social housing. Social inclusion is embedded throughout the Programme strategy and will be made visible in the Specific Objectives, where applicable (for example, in the Types of Action).

2.3 Overview needs and challenges

Based on the 2013 SWOT-analysis six challenges are identified (p.6-9):

- Boosting of knowledge flows between regions and innovation stakeholders, with the aim of stimulating innovation. Needs include: stimulate transnational cooperation between organisations, research and higher education institutions, governments and social institutions to develop new or improved links and synergies; develop and implement new technologies, products and services; close the gap in terms of innovation performance between regions; connect regional clusters at a transnational level.
- SME's innovative capabilities. SME's are the engines of economic growth, and the principle drivers for new employment. There is a need to promote the uptake of all types of innovation (social innovation, product innovation, service innovation, etc.) within SMEs, improve access to innovation funding and support their internationalisation.
- Resource and materials efficiency: a smart use of water, land, air and materials, is of high importance considering the high population density and growing environmental problems in NWE. The NWE countries are among the highest resource consumers in the EU. The challenge is thus to further decouple economic growth from material consumption and thus to make better use of waste materials and energy from waste.
- Energy security and supply: NWE is one of the highest energy consuming regions in the EU with high energy saving potentials particularly in transport and the built environment. To increase the share of renewable energies the emphasis is on stimulating demand rather than supply.
- Vulnerability to climate change effects: problems stemming from climate change could have strong effects on the NWE area, due to the high density of infrastructure and built environment and location near coasts and rivers. There is a need for risk reduction (adaptation) as well as climate change mitigation.
- Inclusion: The economic crisis and austerity measures have had a negative impact on economic and social inclusion for communities – the NWE area faces a considerable challenge to ensure the protection and integration of at-risk populations. Poverty, social exclusion, and (youth) unemployment is highly visible in larger urban areas (excluded neighbourhoods), but probably less pronounced or less visible in rural areas.

These 6 challenges do not relate one-to-one to the Thematic Objectives of the programme (see section 3). The programme contains a separate section on “Integrated approach to territorial development” (p.67-70). In the first part (p.67-68) the programme identifies specific approaches as defined by the ETC Regulation which will *not* be applied in the NWE Programme:

- Community-led local development instruments.
- Integrated actions for sustainable urban development.
- Integrated Territorial Investment (ITI).

It is also stated that the NWE eligible area covers one macro-regional strategy (Danube) and one sea-basin strategy (Atlantic Sea). It states (p.69): The NWE's Programme's Managing Authority and partners are aware of the relevant macro-regional cooperation initiatives and occasionally monitor their progress action plans, looking for possible complementarities. However, the NWE partners do not find it relevant to implement formal coordination mechanisms at this stage. For the Atlantic sea-basin strategy, this is mainly due to a lack of thematic relevance, since the fact that the NWE Programme does not focus on maritime issues. For the Danube Macro-Region Strategy, there is only a small geographical overlap with the eligi-

ble NWE area. In addition the programme identifies priorities of the Atlantic Sea to which it contributes and it will only marginally contribute (due to the small geographical overlap) to the priorities of the Danube strategy.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

The programme document states the following in relation to its strategy: “[T]he Programme cannot address all specific transnational development needs as presented in the overall ambition. Firstly, the Programme has limited resource and financial capacity. Secondly, there is an increased need to ensure the generation of results in the strategic fields of choice. Thirdly, the Programme takes into account the successes of the previous Programme and needs to elaborate on these successes to obtain the best results. Lastly, national support is essential for successful implementation of the Programme. Therefore, the process of defining the strategy is not only evidence based, but also policy based.” (p.9) The strategy is summarised in the next table (p.10).

Specific objective 1: To enhance innovation performance of enterprises throughout NWE regions

Priority Axis 1: Innovation (TO1, IP 1b)

- *Brief justification:* the innovation in NWE is highly geographically concentrated, creating a pronounced territorial divide. Tackling this “territorial gap” and the differences in innovation performance among regions is addressed in this SO. In addition, the NWE area as a whole continues to have difficulties transforming science and research into products and other commercial outputs. This is due to poor circulation of knowledge and limited collaboration among innovation stakeholders, but also to a recurrent lack of critical mass in local innovation communities.
- *Main change sought:* the Programme aims to increase SME innovation levels. This will be done by capturing the innovation efforts at SME level, in line with the Innovation Union and Regional Innovation 2014 Scoreboards. SMEs are considered as the main target group of this SO and will benefit from the provision of support for the testing and development phases of innovation. The Programme will hence act as an innovation enabler at SME level.
- *Expected activities:* 1) enhancing and developing transnational (self-sustaining) clusters or networks; 2) cooperative actions that take forward the development of specific products, services or processes to a stage of market-readiness; 3) actions that aim at supporting development, testing and implementation of innovative solutions for social needs and problems (“social innovation”) in all NWE territories
- *Beneficiaries:* Governmental organisations; civil society stakeholders; education and knowledge institutions, including private or semi-public research organisations; Intermediate bodies, such as chambers of commerce, development agencies, cluster organisations, technology transfer offices; enterprises, including social enterprises

Specific objective 2: To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions in NWE

Priority Axis 2: Low carbon (TO4, IP 4e)

- *Brief justification:* the NWE area is confronted with a need to reduce the carbon footprint in NWE society and with several energy-related challenges, including energy transition management. Transition to restructure the energy systems into more sustainable forms is necessary in NWE. Actions to guarantee energy accessibility and affordability are needed in order to avoid growing social fragmentation.
- *Main change sought:* This SO will lead to a reduction of emissions, less energy consumption and an increase in the use of renewable energy in NWE, in particular in public buildings, public infrastructure and social housing. NWE cities will be more resilient to the effects of climate change.
- *Expected activities:* The success of SO initiatives relies to a large extent on the increased capacity of public institutions in NWE, being the main target group of this SO. Therefore the increased capacity level of public institutions in implementing low carbon measures effectively is the main expected result of this SO. Such a capacity focus will allow the Programme to gain knowledge about how quickly and how far the low carbon strategies have been rolled out in NWE.
- *Beneficiaries:* governmental organisations; public environmental organisations, such as water authorities and nature organisations; intermediate bodies, such as chambers of commerce, development agencies, cluster organisations, technology transfer offices; education and knowledge institutions-, including private or semi-public research organisations; civil society stakeholders; enterprises.

Specific objective 3: To facilitate the uptake of low carbon technologies, products, processes and services in sectors with high energy saving potential, to reduce GHG emissions in NWE

Priority Axis 2: Low carbon (TO4, IP 4f)

- *Brief justification:* The NWE area is characterised by a high level of GHG emissions and a strong dependence on non-renewable energy sources, as well as a lower-than-average proportion of renewable energies in the production and consumption mix.
- *Main change sought:* reduced GHG emissions and pollution and optimisation of the regions' energy consumption and production in the NWE areas (geographic, functional or economic) or sectors responsible for the highest levels of GHG emissions (for example, construction and the built environment). This SO aims to realise the market opportunities presented by Low Carbon and Environmental Goods and Services (LCEGS).
- *Expected activities:* Actions focus on demonstrating low carbon solutions, illustrating their feasibility, relevance and economic/environmental rationale. Actions will raise awareness among all relevant stakeholders and hereby increase the implementation of low carbon solutions. The focus is exclusively on the uptake of existing low carbon technologies, products and services.
- *Beneficiaries:* enterprises, including SMEs; governmental organisations; civil society stakeholders promoting energy saving measures; intermediate bodies, such as chambers of commerce, development agencies, cluster organisations, technology transfer offices; environmental and energy agencies; households/inhabitants.

Specific objective 4: To facilitate the implementation of transnational low-carbon solutions in transport systems to reduce GHG-emissions in NWE

Priority Axis 2: Low carbon (TO7, IP 7c)

- *Brief justification:* The transport sector is by far the largest consumer of energy in the EU and also one of the main sources of pollution and CO₂ emissions. With a large transport sector, NWE countries rank among the leading polluters in the EU, notably in terms of GHG emissions. In addition air pollution is causing public health problems, especially in densely populated areas.
- *Main change sought:* to improve the conception and coordination of low carbon transport and mobility solutions by the sector by increasing its institutional capacity. This can be achieved by maximising the potential of heterogeneity of the public-private partners involved in the NWE projects.
- *Expected activities:* targeting the transnational components of NWE transport systems: it does not support stand-alone solutions, but focuses on corridors or transport systems. These are important for inter-country or inter-regional flows of goods or people and therefore relevant for all NWE countries.
- *Beneficiaries:* governmental organisations; civil society stakeholders; education and knowledge institutions, including private or semi-public research organisations; intermediate bodies, for example chambers of commerce, development agencies, cluster organisations, technology transfer offices; enterprises in the transport sector.

Specific objective 5: To optimise (re)use of material and natural resources in NWE

Priority Axis 3: Resource & materials efficiency (TO6, IP 6f)

- *Brief justification:* there is a need to decouple economic growth from material consumption, and drive an absolute reduction in the use of natural resources in production activities, in particular those that tend to be intensive in their use of natural resources and raw materials.
- *Main change sought:* to accelerate the transition of the NWE economy to a circular model (3Rs – Reduce, Reuse, Recycle) by enabling spill-over effects of eco-innovation in the resource intensive industry. This will be achieved by increasing competences.
- *Expected activities:* the drive towards eco-innovation is facilitated by collaboration among innovation stakeholders on the development and testing phases of innovations and/or innovative solutions that are less material intensive than those currently on the market. This SO also covers actions focusing on the use of land in production processes (for example, non-food crops).
- *Beneficiaries:* governmental organisations; civil society stakeholders; education and knowledge institutions-, including private or semi-public research organisations; intermediate bodies such as chambers of commerce, development agencies, cluster organisations, technology transfer offices; public environmental organisations, such as water authorities and nature organisations; enterprises.

Table 2.1: NWE Programme Specific Objective: Expected results and result indicator

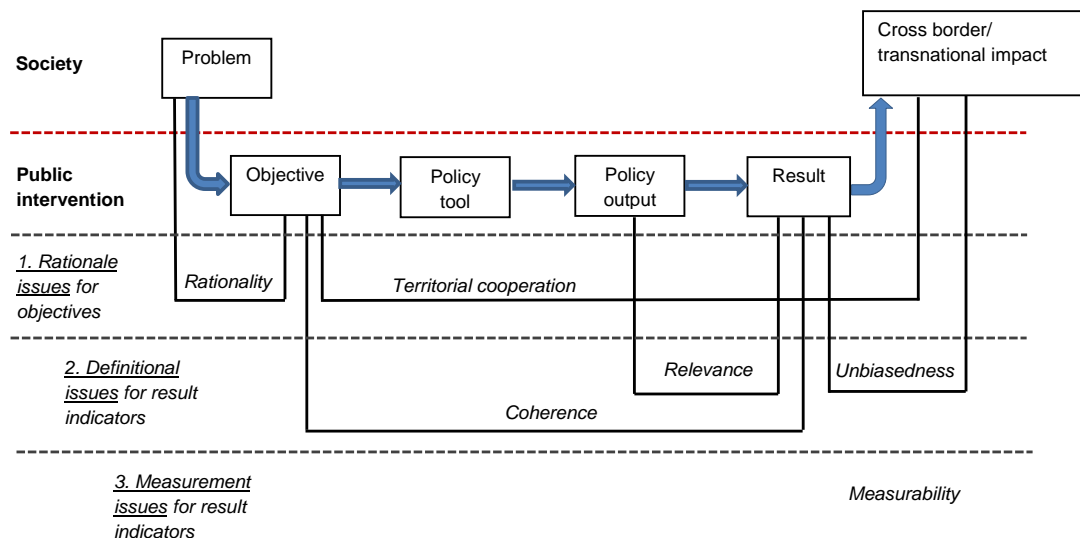
SO	Expected results	Result Indicator
SO1	NWE has considerable innovation potential and hosts some of Europe's top innovation performers. However, this potential is highly geographically concentrated, creating a pronounced territorial divide. Tackling this "territorial gap" and the differences in innovation performance among regions is specifically addressed in this SO. As a result of this Specific Objective, the Programme aims to increase SME innovation levels. This will be done by capturing the innovation efforts at SME level, in line with the Innovation Union and Regional Innovation 2014 Scoreboards. SMEs are considered as the main target group of this SO and will benefit from the provision of support for the testing and development phases of innovation.	Degree of SME involvement in collaboration with other institutions (including R&D)
SO2	This SO will lead to a reduction of emissions, less energy consumption and an increase in the use of renewable energy in NWE, in particular in public buildings, public infrastructure and social housing. NWE cities will be more resilient to the effects of climate change. The success of these initiatives relies to a large extent on the increased capacity of public institutions in NWE, being the main target group of this Specific Objective. Therefore the increased capacity level of public institutions in implementing low carbon measures effectively is the main expected result of this SO.	Effectiveness of the NWE public sector organisations in the implementation of low carbon strategies
SO3	This SO will lead to reduced GHG emissions and pollution and optimise the regions' energy consumption and production in the NWE areas (geographic, functional or economic) or sectors responsible for the highest levels of GHG emissions (for example, construction and the built environment). The expected result of initiatives undertaken within this Specific Objective will be the removal of barriers to the adoption of and improvement of conditions for low carbon technology deployment by enterprises (the main target group of this SO).	Status of conditions for low carbon technology deployment in NWE
SO4	This SO will lead to reduced GHG emissions in transport systems in NWE (such as networks of mobility connections, flows of passengers and goods, travel patterns, logistics chains, multimodal systems). The expected result of this Specific Objective is related to the main target group, the transport sector (passenger and freight). The Programme aims to improve the conception and coordination of low carbon transport and mobility solutions by the sector by increasing its institutional capacity.	Status of competences of the transport sector in the use of low carbon solutions in the transport systems
SO5	This SO will lead to an optimised use of material resources and a reduction in the use of natural resources in NWE. Success will be measured in terms of the use and uptake of eco-innovations in NWE, but also in terms of the resource savings and (waste) recycling rates they generate. The expected result of this Specific Objective relates to the main target group, the resource intensive industrial sectors. The Programme aims to accelerate the transition of the NWE economy to a circular model (3Rs – Reduce, Reuse, Recycle) by enabling spill-over effects of eco-innovation in the resource intensive industry. This will be achieved by increasing competences in the resource-intensive sectors.	Status of competences in the resource intensive sectors in NWE for eco-innovation diffusion

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
1	To enhance innovation performance of enterprises throughout NWE regions	Degree of SME involvement in collaboration with other institutions (including R&D) (Percentage)	HIGH	HIGH	HIGH	MEDIUM - The involvement in collaboration is more an output than a result	LOW - Several other factors may influence the firms' decision to collaborate in innovation activities (specialization proximity, functional specialization, etc.)	MEDIUM - The share does not take into account the potential decrease in the overall number of SMEs
4	To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions in NWE	Effectiveness of the NWE public sector organisations in the implementation of low carbon strategies (Percentage)	HIGH	LOW - It is not clear how territorial cooperation contributes to the achievement of the result	HIGH	LOW - What does effectiveness mean in this context?	LOW - Several other factors may influence the capacity of public organizations in the implementation of such strategies (institutional quality, institutional structure, functional specialization, etc.)	LOW - How is effectiveness defined?
4	To facilitate the uptake of low carbon technologies, products, processes and services in sectors with high energy saving potential, to reduce GHG emissions in NWE	Status of conditions for low carbon technology deployment in NWE (Percentage)	HIGH	LOW - It is not clear how territorial cooperation contributes to the achievement of the result	HIGH	LOW - Instead of the conditions, the result indicator should capture the reduction of GHG emissions due to the improved conditions	LOW - Several other factors may influence the conditions for low carbon deployment (sectoral specialization, expenditure in innovation, etc.)	LOW - How are the conditions and their characteristics defined?
7	To facilitate the implementation of transnational low-carbon solutions in transport systems to reduce GHG emissions in NWE	Status of competences of the transport sector in the use of low carbon solutions in the transport systems (Percentage)	HIGH	HIGH	HIGH	LOW - Instead of the competences, the result indicator should capture the reduction of GHG emissions due to the improved conditions	HIGH	LOW - How are competences and their status defined?
6	To optimise (re)use of material and natural resources in NWE	Status of competences in the resource intensive sectors in NWE for eco-innovation diffusion (Percentage)	HIGH	LOW - It is not clear how territorial cooperation contributes to the achievement of the result	HIGH	LOW - Instead of the competences, the result indicator should capture the improvement in waste collection and reuse	HIGH	LOW - How are competences and their status defined?

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

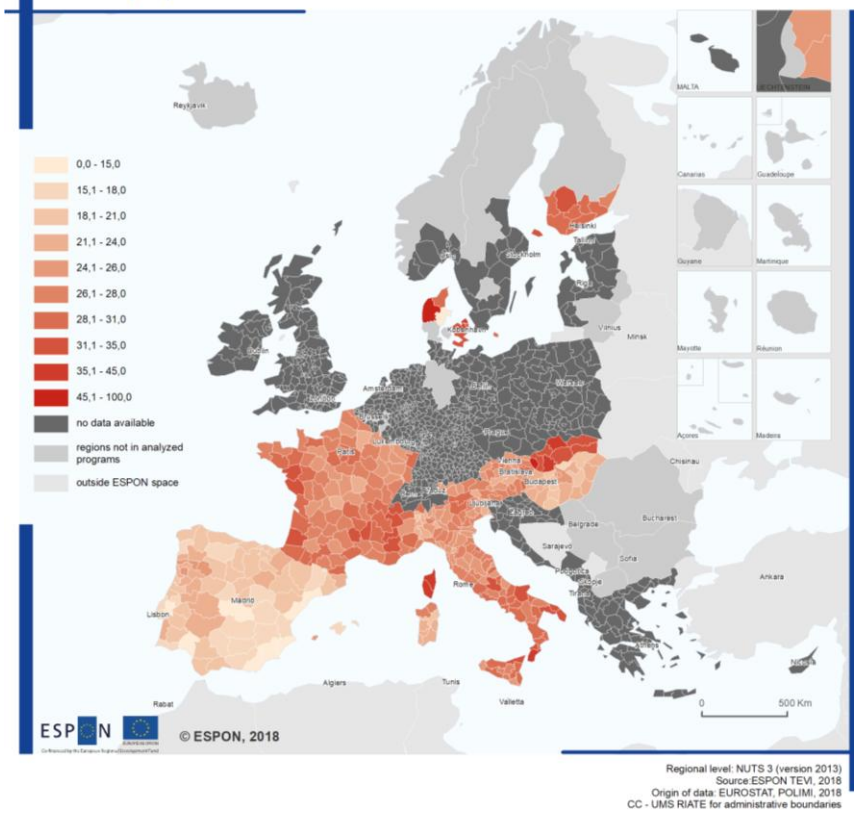
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Programme	Thematic objective	Specific objective	Output indicator	Result indicator	Proposed result indicator
Nort West (1)	1	To enhance innovation performance of enterprises throughout NWE regions	O1: Number of new or enhanced transnational clusters or innovation networks (No. of clusters and innovation networks) O2: Number of technologies, products, services and processes developed and tested in real life conditions (No. of solutions tested) O3: Number of pilot actions implemented, focusing on social innovation (No. of actions) O4: Number of jobs created in all economic sectors (No. of jobs) O5: Number of jobs maintained in all economic sectors (No. of jobs) O6: Amount of funding leveraged by the project (in €) (EUR) O7: Number of end-users benefitting from social innovation (No. of end-users) CO1: Number of enterprises receiving support (No. of enterprises) CO2: No. of enterprises co-operating with research institutions (No. of enterprises) CO3: Number of enterprises supported to introduce new to the market products (No. of enterprises) CO4: Number of enterprises supported to introduce new to the firm products (No. of enterprises)	Degree of SME involvement in collaboration with other institutions (including R&D) (Percentage)	Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors
Nort West (2)	4	To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions in NWE	O1: Number of solutions facilitating the delivery of existing or emerging low-carbon, energy or climate-protection strategies (No. of solutions) O2: Number of combined mitigation-relevant adaptation solutions implemented (No. of solutions) O3: Number of jobs created in all economic sectors (No. of jobs) O4: Number of jobs maintained in all economic sectors (No. of jobs) O5: Amount of funding leveraged by the project (EUR) CO1: Number of households with improved energy consumption classification (No. of households) CO2: Decrease of annual primary energy consumption of public buildings (kWh/year) CO3: Estimated annual decrease of GHG (Tonnes of CO ₂ eq)	Effectiveness of the NWE public sector organisations in the implementation of low carbon strategies (Percentage)	Synthetic indicator: CO ₂ emissions + N ₂ O emissions
Nort West (5)	6	To optimise (re)use of material and natural resources in NWE	O1: Number of efficient natural and material resources solutions implemented and tested (No. of solutions implemented) O2: Number of innovative uses of waste processes/ products/ services from waste materials (No. of solutions designed) O3: Amount of funding leveraged by the project (EUR) O4: Amount of decreased raw material use (Tonnes) O5: Amount of increased material recovery, re-use and recycling (Tonnes) O6: Number of jobs created in all economic sectors (No. of jobs) O7: Number of jobs maintained in all economic sectors (No. of jobs) CO1: Number of enterprises receiving support (No. of enterprises) CO2: No. of enterprises co-operating with research institutions (No. of enterprises) CO3: Number of enterprises supported to introduce new to the market products (No. of enterprises) CO4: Number of enterprises supported to introduce new to the firm products (No. of enterprises)	Status of competences in the resource intensive sectors in NWE for eco-innovation diffusion (Percentage)	Per capita amount of waste collected (to be controlled for other influential factors through DID)

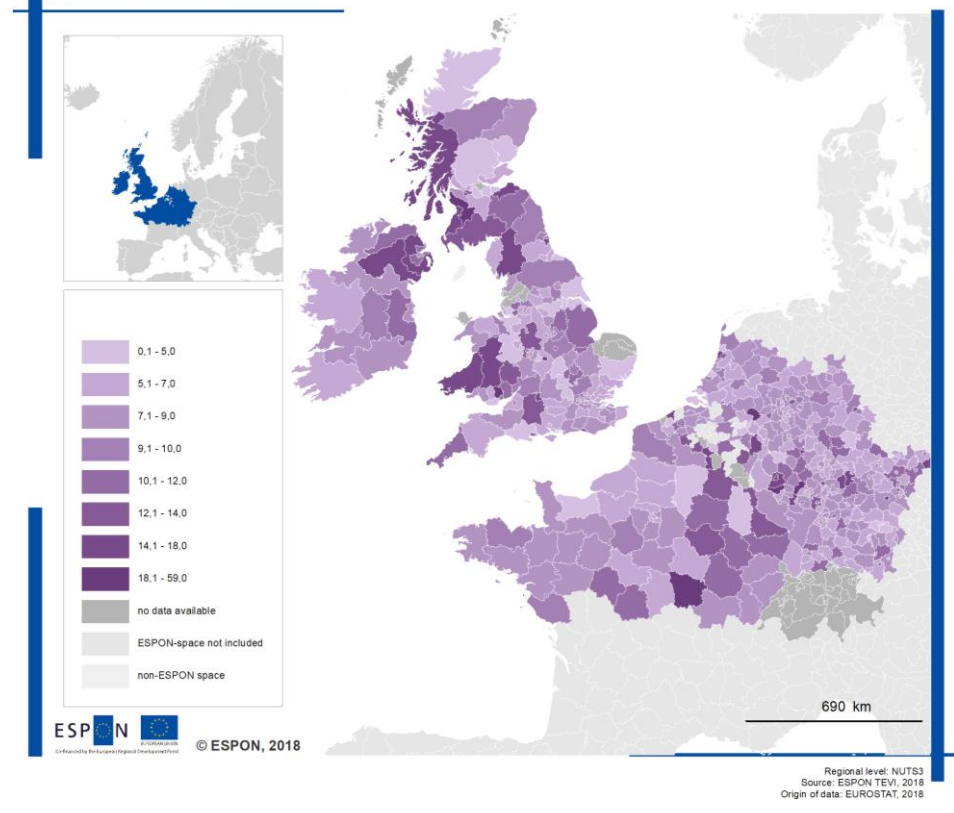
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)

Composite Indicator: patent applications + trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined time period. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. A minimum of 0.2 can be observed, with corresponding maximum of 200. The highest value is represented by the Paris area which dominates also in the European context. In the NWE area, other higher values are found in Dublin, many French regions, Essex, Luxembourg, urbanized regions of the Netherlands, area of Brussels as well as only few NUTS3 regions in Germany.

In the European context, there are only single regions where the value of this indicator nears the maximum; these are the areas of Madrid, Rome, Milano, Stockholm and Barcelona. This suggests that higher values of this indicator can, understandably, be found in cities and urban

⁶nama_10r_3gva

⁷nama_10r_3empers

areas. Comparing with the pan-European context, the NWE programme area has a large number of regions with a darker shade, which is comparable only with the rest of France, Spain, Sweden and Italy in the rest of Europe. However, in the European context the highest indicator values in NWE pale what suggests that strongest-performing European regions out-perform strongest-performing NWE regions.

Most of European territory is characterized by lighter shades, especially Eastern, Central and South-Eastern Europe, which indicates lower indicator values. In the NWE territory, light-coloured areas are found predominantly in rural areas, such as Wales, some regions in Eastern France, Southern Belgium and Germany.

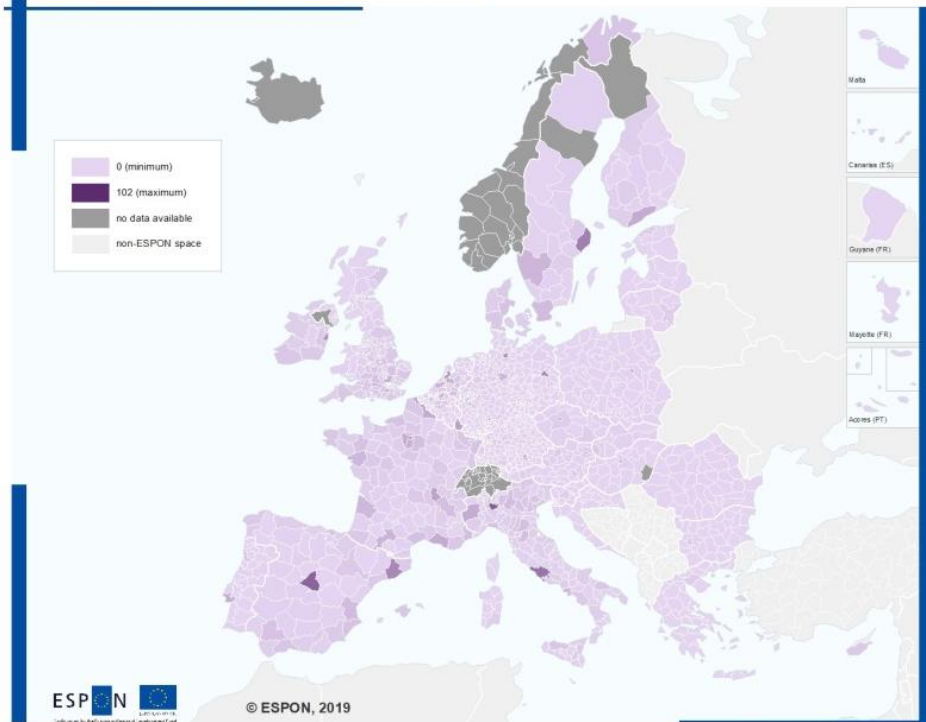
Increases in value added, in comparison with the European context, remain pronounced. Certain economically more successful clusters (for example the Greater London Area, Dublin, Amsterdam-Rotterdam and Paris) stand out in the European context. For the largest part, added value generation patterns follow European wide trends, with significant generation in urban centres and a limited degree of (generally urbanised) clusters. In comparison with the European context, added value growth has been relatively lower in central France and Southern Belgium.

The pattern of dispersion of value added generation in knowledge intensive sectors around Europe is primarily city-driven. Generally, urban centres generate sizeably more value added growth in knowledge intensive sectors, than rural and peri-urban regions. This is especially visible on the western and eastern flanks of the programme area, with region concentration in the metropolitan areas of London, Paris and the Ruhr Area. Surrounding areas generally feature relatively lower rates of growth, pointing towards the existence of hinterlands which primarily supply urban areas with labour, as opposed to housing knowledge intensive industries or services themselves. These urban-regional divides can be observed around Paris, with a stark decline noticeable between the NUTS-3 region of Paris and the surrounding belt.

Another identified pattern is the existence of groups of regions with moderate to high growth in value added in knowledge intensive sectors. These are predominantly found in the Dutch regions of the programme area, especially on its western flank closer to the Amsterdam-Rotterdam cluster and in Northern Brabant. These clusters are also found in the Ruhr Area and Flanders.

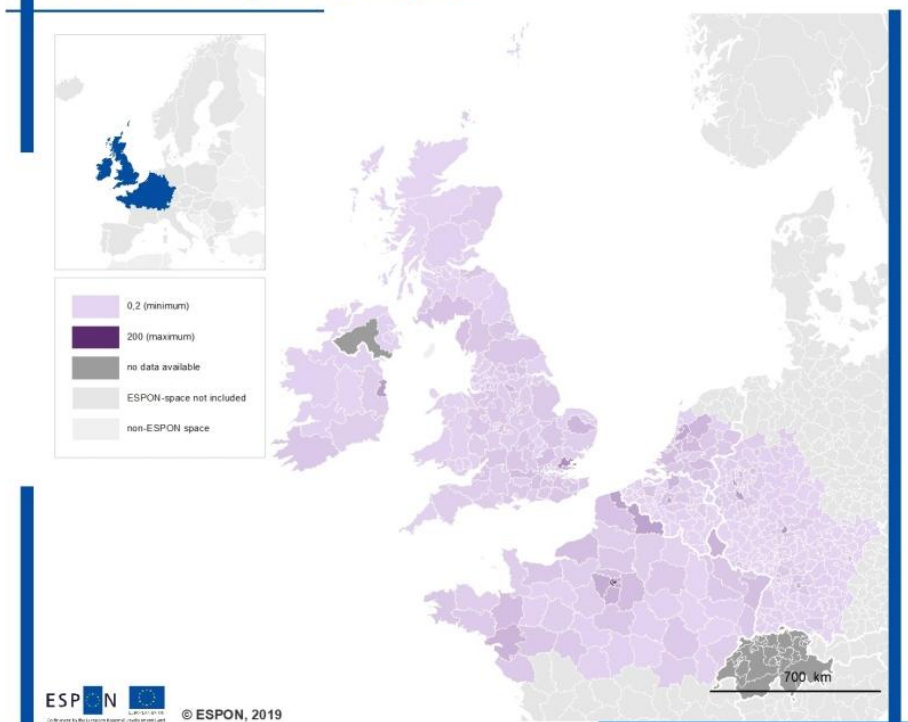
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR
 © UMS RIATE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR

4.2 Innovation

The maps below present the synthetic composite indicator *Innovation* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Innovation in the framework of the indicator is restricted to technical innovation via patent and trademark registration, thus not necessarily reflecting the status of social innovations. The composite indicator quantifies the innovation outputs undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework innovative economic activities. The indicator is calculated in the following manner:

$$Innovation = \frac{1}{2} * P_{i,t} + \frac{1}{2} * T_{i,t}$$

In which the variable $P_{i,t}$ represents normalised patent application values per NUTS-3 region to the European Patent Office in region i and at time t . Analogously, $T_{i,t}$ represents normalised trademark applications in a given region i and at time t . Thus, the indicator captures scientific and technical innovation, in addition to capturing process innovation via new products and similar by companies. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Trademark values on NUTS-3 level are obtained via the indicator European Union trade mark (EUTM) applications by NUTS 3 regions⁹.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. For the NWE area, a minimum of 0.2 can be observed, with corresponding maximum of 102.9 while in the European context the minimum is 0 and the maximum is 100. Similar to the indicator above, this indicator shows a differentiated picture with only single regions with outstanding values. In the NWE area, highest values can be found, again, in Paris and other French regions, South Netherlands especially the Zeeland region, North East England especially the area of Cleveland, Luxembourg, area of Stuttgart and East Belgium. In the European context, these values are not as outstanding anymore and pale slightly against

⁸ tgs00041

⁹ ipr_ta_reg

other French, Spanish (Madrid and Barcelona), Italian (North Italy and Milano), Austrian (South Burgenland), Norwegian (Rogaland, Hordaland), Swedish (Blekinge, Västra Götaland and Stockholm) and Finnish (Kainuu) regions. This suggests that in regards to this indicator some European regions outperform the well-performing NWE regions. Minima are located in large parts of the United Kingdom (especially Wales, Cornwall and Scotland), the Massif Central, as well as Central Germany. Within Europe, lower values are dispersed but mostly found in East and South Europe as well as North Sweden, Finland and areas of Ireland, Portugal and Spain.

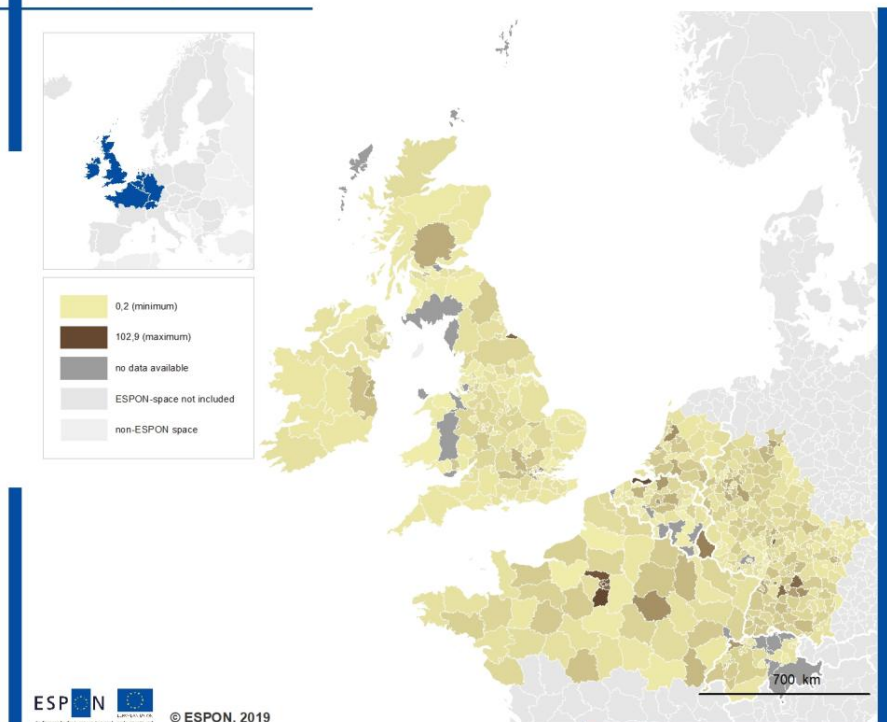
In the European context, innovation (measured by patent and trademark application) is concentrated along urban areas and clusters of R&D institutions. These regions tend to be relatively richly endowed in human capital with strong research institutions. Varying patterns can be identified. In some areas, a concentration of innovative activities to regional centres, generally capital cities, can be observed. This pattern is strongly observable on the Iberian peninsula with regional extrema in Madrid and Barcelona. Surrounding regions of these centres tend to feature a very low degree of innovative output. Another observable pattern are large clusters of regions, featuring moderate to high innovation output. These clusters generally rank in the mid-fields in terms of absolute indicator scores. Examples of these (sometimes large) clusters include Northern Italy (with a regional extrema in Milano and a surrounding cluster of moderately to well scoring regions), the Dutch region of Holland and Southern Germany.

In contrast with developments in gross value added, innovation output is distributed significantly more homogeneously across the programme area. Major urban centres tend to also feature higher innovative output. This is visible when contrasting the Greater London Area with Cornwall. Regions characterised by strong economic output (such as Paris and Stuttgart) perform significantly better than less strongly developed regions. Additional factors characterising regions with strong performance in the indicator is the existence of R&D sectors with strong interlinkages to the economy. This is observable in the Rhine-Ruhr Area and Holland.

Urban centres with established universities also perform significantly better than their rural peers. This pattern can be observed in generally in capital cities within the programme area (e.g. London, Dublin, Paris).

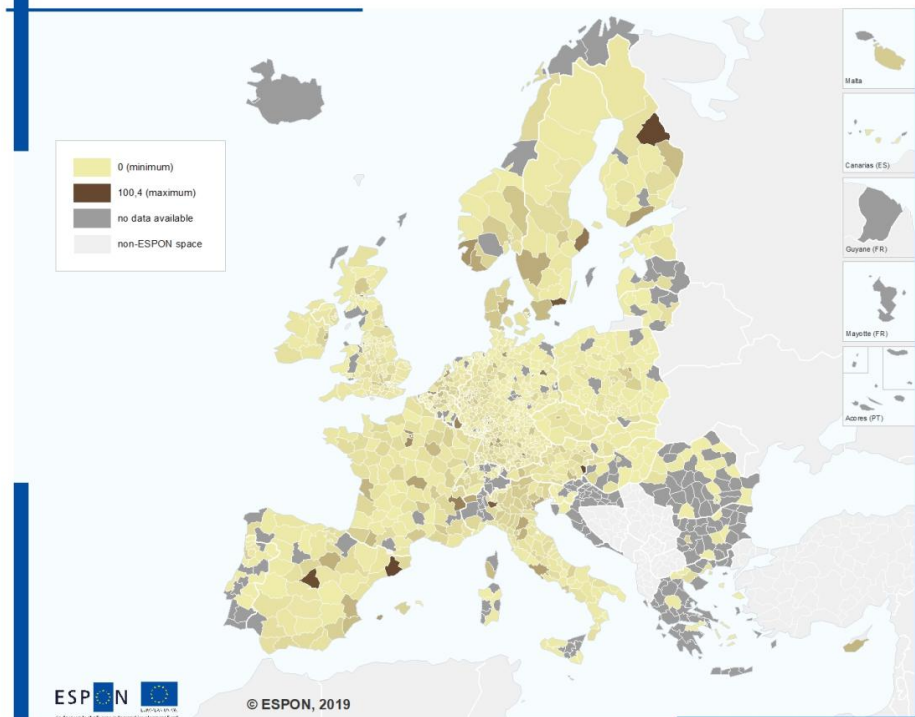
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Polimi, CIR

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, Polimi, CIR
© UMS RIATE for administrative boundaries

4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies the developments in tourism and sustainability in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations and inverted. The indicator stems from Eurostat and is available in monthly intervals at national level¹⁰. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹¹ is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹². This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 0.6 can be observed with corresponding maximum of 106.7. Minima are found predominantly in less populated areas, large portions of France, Ireland, England and the Netherlands. Conversely, maxima are concentrated in urban centres, such as Paris, where the vast amount of attracted tourists and generally low seasonality outweigh limited NATURA 2000 sites, as well as regions in North, West and East of England, Wales, North-Western France, South of Belgium and many regions in Germany. The picture changes completely in the European context. Most of England and Northern Ireland become paler as

¹⁰ tour_occ_nim

¹¹ Source: EEA, DG REGIO

¹² tour_occ_anor2

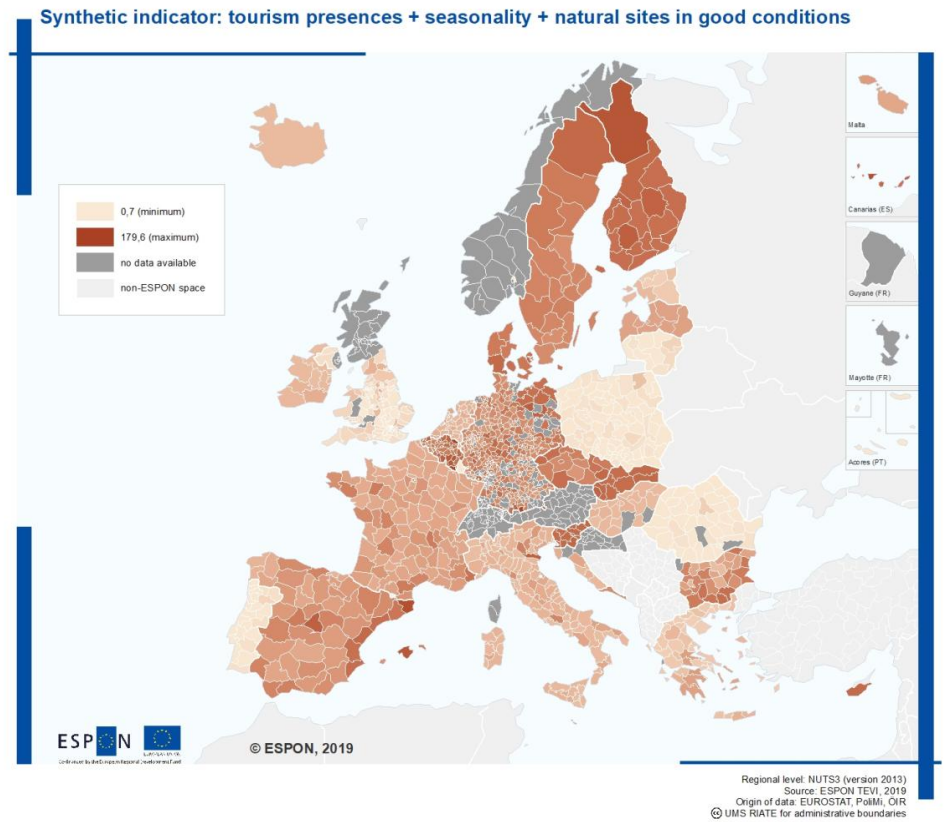
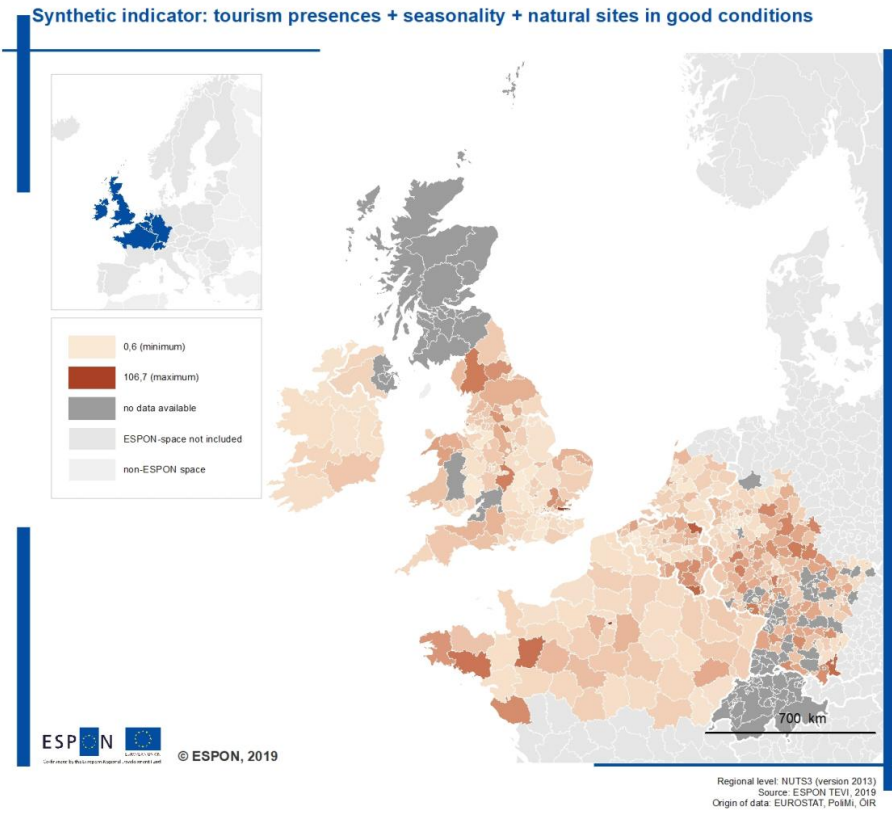
countries Spain, France, Germany, Czech Republic, Slovakia, Sweden, Norway and Romania represent high indicator values. In the European context, in contrast to the NWE context, Belgium, France, Ireland and the Netherlands grow in intensity. However, the European benchmarking of this indicator suggests that the NWE area, except for England, Northern Ireland and Luxembourg, performs well.

As the indicator *sustainability* measures both increases in tourism, as well as its detrimental impacts (via potential changes to the environment, measured by the annual seasonality of tourism and changes in NATURA 2000 sites), a higher scoring region is not necessarily a region which is attracting substantially more tourists, but may shine in other aspects (e.g. low seasonality of tourism). This can be observed in the maps below on European scale and across the programme area.

On European scale, several kinds of well performing regions can be identified: regions with predominantly low seasonality of tourism (e.g. regions within Belgium), regions with a large NATURA 2000 surface area in relation to their size (particularly Northern Sweden and Finland) and regions attracting a large degree of tourists (South-eastern Spain and Balearic Isles). Vice versa, there are also substantially many regions which may perform relatively well in one area (e.g. tourism), however, with a relatively low rating due to significant underperformance in other factors (e.g. concentrated seasonality around summer months). An example of this is Portugal. Most regions in the middle ground across Europe feature a combination of one of the factors outlined above with a relatively low rating in one of the other factors. An illustration of this phenomenon is Northern Italy, which boasts high popularity in terms of overnight stays, however, concentrated along summer months.

The programme area scores in the lower midfield in comparison with the European context. The relatively high performance of German regions within the programme area is generally due to their relative large size of NATURA 2000 sites in combination with a relatively low seasonality. Belgian regions, especially in the cluster observable in Wallonia, feature very low seasonality together with moderately sized NATURA 2000 sites. French regions along the channel coast are characterised by mostly high numbers of overnight stays combined with high seasonality, translating into a lower performance.

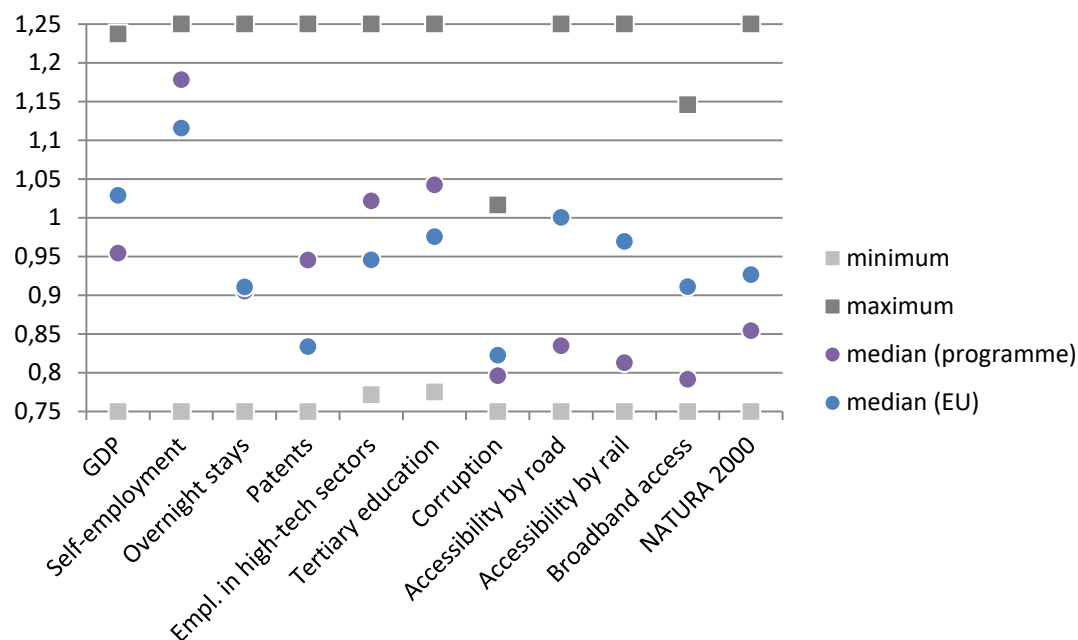
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions



4.4 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

A relative large range of values across the programme regions is observed across all presented indicators, indicating a large degree of heterogeneity across the programme area. The North West Europe Programme Area performs relatively well in patent generation, self-employment, and employment in high technology industries, tertiary education. In case of remaining indicators, the Programme Area is performing worse than EU median, these include GDP, road and rail accessibility, broadband access, number and size of NATURA 2000 sites; the perception of quality of governance in relation to corruption is also lower than in the EU.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

Smart Growth	Strength	Weaknesses	Opportunities	Threats
Strengthening research, technological development and innovation	<p>Excellent world-class R&D infrastructure and high R&D intensity: NWE hosts many regions of the EU which have surpassed the European target value of 3% in R&D expenditure (10 out of 24) and also a number of others which are close to the target.</p> <p>High and very high levels of human resources employed in science and technology, esp. on the continental part of NWE.</p> <p>For employment in high-tech sectors, NWE holds a generally strong position in this segment in an EU-wide perspective (many NWE regions have employment</p> <p>The largest part of NWE is covered by regions with high and/or a medium-high level of innovation performance. NWE also hosts a large number of EU regions with a high innovation potential (i.e. the "strong innovation generators") and also many regions with a good innovation potential ("good innovation performers").levels above the EU27 average).</p> <p>High concentrations of knowledge-intensive services, including sectors which are important for the</p>	<p>High disparities among NWE regions in total intramural R&D expenditure</p> <p>Employment in Knowledge Intensive Services is concentrated around large city regions</p> <p>A general dichotomy among NWE regions between innovation leaders and innovation followers</p> <p>In a global perspective, R&D spending of most NWE countries still remains behind the R&D expenditure of most of their main competitors (esp. Japan, South Korea, US), but often still above the spending in BRIC countries.</p> <p>Within the EU, some NWE countries are also behind the Scandinavian countries</p> <p>Within NWE, high geographical concentration of R&D spending (a few regions), lower levels in all other regions.</p> <p>.Only a few NWE regions have a very high shares of researchers employed in all sectors and also very high shares of employment in high-tech sectors (pronounced geographical concentration territorial divide).</p> <p>Strong geographical concentration of top innovation performance and top innovation potential (pronounced territorial divide). Also high innovation concentration in large companies,</p>	<p>All NWE countries have a sector/cluster oriented strategy for innovation. In some cases, these are developed at the regional level.</p> <p>The NWE programme may promote excellence and synergy by matching regional innovation approaches and connecting clusters from the bottom up. Promising avenues for transnational cooperation in NWE to improve smart growth thus include economic relations between knowledge clusters across NWE.</p> <p>The transnational approach may provide a means to develop joint strategies to attract highly skilled knowledge workers into NWE and support their integration</p> <p>Transnational cooperation can be a useful instrument to generate critical mass and diversify the local knowledge base within regions</p> <p>Smart specialisation can be a tool for a further raise of R&D spending in NWE regions, thus leading to a more widespread fulfilment of the 3% target.</p> <p>High and very high levels of human resources employed in science and technology as an opportunity to</p>	<p>The knowledge intensive economy in the NWE is important, but under strain from the economic crisis and reduction in investments</p> <p>There are significant regional differences which seem to be increasing in knowledge intensive services, innovation potential, and innovation performance</p> <p>Continuing public indebtedness crisis and problems of the EU banking sector might lower public and private R&D spending.</p> <p>Increasing R&D intensity in the developing economies (BRIC countries)</p> <p>Smart specialisation can even further increase the already observable geographical concentration in terms of regional innovation performance and regional innovation potential (further growing territorial divide).</p> <p>The adoption of a "one-size" fits all approach to innovation support may prove to be ineffective due to the diversity of regional profiles within NWE</p> <p>The promotion of process innovation may result in the reduction of jobs in "blue collar" regions</p>

Smart Growth	Strength	Weaknesses	Opportunities	Threats
	<p>well-being and an attractive environment like health care, creative industries and leisure industries. Patenting levels in the NWE are higher than the EU15 average</p> <p>High levels of cluster specialisation in knowledge intensive business sectors (education and knowledge creation, business services), life sciences (biotech and pharmaceuticals) and standard sectors such as entertainment, instruments, chemicals, plastics, aerospace and automotive</p> <p>The NWE are is home to an important number of "strong clusters in innovative regions"</p> <p>Institutes and regions in NWE are well represented in all three of the existing Knowledge and Innovation Communities. There is a particularly important number of co-location centres of the Climate KIC located in NWE.</p>	<p>but not so much in SMEs.</p> <p>Persisting problems as regards a transfer of science and technological research into products & other commercial outputs.</p>	<p>foster competitiveness and to cope with globalisation.</p> <p>Increasing potential of knowledge-intensive services & creativity</p> <p>Regional innovation strategic documents reveal the existence of common regional innovation support priority fields within the NWE area</p> <p>Eco-innovation and social innovation represent a means through which the high innovation potential of the region can be mobilised to address key social and environmental issues in the NWE area</p>	
Enhancing access to, and use and quality of, information and communication technologies	<p>Relatively good global positioning of most NWE countries (DE, UK, LU, CH, BE) in terms the overall ability of individuals to access & use ICT.</p> <p>Broadband connection above 50% in most NWE areas, but regions with more than 75% of household broadband connectivity only exist in the UK and in the Netherlands. Here also high shares of e-commerce activities of individuals</p>	<p>Weak global positioning of France & Ireland in terms the overall ability of individuals to access & use ICT.</p> <p>Weak broadband connection of households in parts of Ireland (Border, Midland and Western region), Belgium (Walloon region) and in larger parts of France larger parts of France (except Ile-de-France). Here also lower shares of e-commerce activities of individuals.</p> <p>Lack of potential for</p>	<p>Further development of the Information Society in NWE and especially catching-up processes in the still weakly connected regions continue. This creates a potential for closing the broadband connectivity gap in NWE and offers the possibility for further expanding ICT applications & services to improve the life of citizens (e.g. health & public services).</p>	<p>Loss of currently good positioning in a global context (i.e.</p> <p>Insufficient investment by private ICT suppliers and pressure on public finances reduces private & public investments in broadband (persistence of broadband connectivity gap in NWE), while new technologies and services continue to develop faster than infrastructure is developing.</p> <p>Continuing exis-</p>

Smart Growth	Strength	Weaknesses	Opportunities	Threats
	<p>als. New ICT-based technologies and services easily available (e.g. e-health, e-government etc)</p> <p>Low share of the population never having used the internet esp. in the UK, the NL, LU, DE and larger parts of BE.</p> <p>Shares of persons having computer & internet skills (low, medium, high) is in nearby all NWE countries clearly above the EU27 average (NL, DE, UK, BE, FR). As regards only the computer skills levels, favourable position of regions in NL, DE, and UK and the whole of LU.</p> <p>The basic conditions for a highly innovative ICT sector are present in NWE (broadband access and internet skills)</p>	<p>developing new ICT services.</p> <p>High share of the population never having used the internet esp. in France (Nord Pas-de-Calais & Brittany), Ireland (the Border, Midland and Western region) and in some provinces of the Walloon region.</p> <p>Shares of persons in Ireland having computer & internet skills (low, medium, high) is at or close the EU27 average. As regards only the computer skills levels, less favourable position of regions in IE and BE.</p>	<p>Catching-up processes in the still weakly internet using regions continue and potentials exist for closing the internet usage gap in NWE.</p> <p>Successive elimination of the ICT skills barrier (e.g. through better education), creating a digitally inclusive Information Society in NWE.</p>	<p>tence of digital inclusion gap due to various reasons (e.g. affordability due to low incomes, lack of ITC skills, age-specific factors etc).</p> <p>Persistence of the ICT skills barrier (e.g. through low income & lacking opportunity), creating a digitally excluded population segment in the NWE Information Society.</p>
Enhancing the competitiveness of SMEs	<p>Existence of EU-level national and regional policies for competitiveness and SMEs.</p> <p>Existence of national and regional policies to support start-ups.</p> <p>A large number of NWE regions have high or medium-high levels of competitiveness in the EU27 and also strong and largely competitive SMEs in manufacturing and other knowledge-intensive sectors (information & communication; professional scientific & technical activities).</p> <p>Within NWE, regional clusters in Ireland, the Netherlands and in most parts of Germany as well</p>	<p>National and regional policies for competitiveness and SMEs are not yet well-interlinked. EU funding is not flexible enough for SMEs.</p> <p>The support to new business development models is not a competence of ETC programme actors & main stakeholders.</p> <p>Different factors still limit the creation, growth and thus the competitiveness of SMEs: Relatively low level of capital intensity, difficult access of SMEs to finance, unfavourable environment for business creation and growth, lacking ability to adopt or develop innovations, limited operation of SMEs outside & access to markets</p>	<p>Enhancing the industrial competitiveness of businesses and SMEs particularly in the manufacturing sector, but also in other knowledge-intensive sectors (information & communication; professional scientific & technical activities).</p> <p>Focus action on existing enterprise clusters or networks in Sectors of Specialisation : Through inter-connecting regional clusters in a transnational perspective, a critical mass can be achieved for R&D and innovation, skills, funding, the cross-fertilisation of ideas and entrepreneurial initiatives.</p>	<p>Further growing public indebtedness and escalation of EURO-crisis: Shortage of public funding support for SMEs</p> <p>Further growing public indebtedness and escalation of EURO-crisis: growing problems of SMEs to access private financing sources (e.g. via banks) and lack of venture capital for SMEs and start-ups (particular at the early-stage, private capital lenders can be increasingly reluctant to invest).</p> <p>Further weakening of regional clusters in NWE.</p>

Smart Growth	Strength	Weaknesses	Opportunities	Threats
	as in Flanders and Ile-de- France appear to be quite strong.	(i.e. internationalisation). Within NWE, regional clusters are weak in the whole of UK, larger parts of France, Walloon region, Luxembourg, parts of Rhineland Palatinate). The "hot spots" among the latter are particularly Scotland, Wales and several UK regions as well as several regions in France (Lorraine, Bretagne Bourgogne) and Luxembourg.	The transnational approach may provide opportunities to develop the international competitiveness of SMEs and develop joint opportunities to respond to new consumer trends (e.g. online retailing)	

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

Sust. Growth	Strength	Weaknesses	Opportunities	Threats
Supporting the shift towards a low-carbon economy in all sectors	Existence of a broad public and political awareness in NWE (as a window of opportunity) on a necessary shift towards a low-carbon economy. On the production side, the share of renewables has increased vastly in DE, LU. On the consumption side, the share of renewable is still limited in NWE and in all countries – except France – below the EU27 average. Scientific solutions exist in NWE, but also concrete examples for a more "place- based" (local) and cheaper energy provision through a use of renewable energy sources.	The share of renewables in energy production and consumption is below EU 27 average in all of NWE countries except Germany. Negative influence of external behaviour in this context (Why should we do it if China or the US is not doing it?). New solutions (scientific & technical) are still too costly. Also negative externalities such as e-pollution associated to electricity grids are mobilising people to reject or delay energy infrastructure projects. Energy infrastructures (grids) are often outdated and also poorly interconnected in a cross-country perspective. Necessary investments in energy infrastructures are not taking place (or not as quickly as needed), notably due to the current	Regarding energy efficiency, there may be significant scope for transnational cooperation on improving and retrofitting the existing built environment. There is much potential for improving energy efficiency in buildings (including both the private and public sectors). The gap between EU2020 targets and national targets regarding sustainable energy and CO ₂ reductions is significant. A strategy could include eco-innovation as well as the implementation of proven technologies and applications. Further stimulate a change in behaviour and also an even broader public acceptance of the low carbon shift. The territorial dimension of energy production	Loss of public and political acceptance due to significant cost-raising effects resulting from a low carbon-oriented energy provision. Growing public indebtedness and also a continuation of lengthy and uncertain permitting procedures will significantly hinder the required future deployment of efficient and smart energy infrastructures. Continuing absence of alternative and cheaper solutions for a more local/place based energy-provision on ground of renewables and further raising energy process for consumers.

Sust. Growth	Strength	Weaknesses	Opportunities	Threats
		<p>regulatory framework and other procedural aspects.</p> <p>Still existing hurdles to deliver alternative energy production (e.g. solar & wind energy) to the networks/grids.</p> <p>Low solar potential of the NWE region</p>	<p>and consumption from renewables offers scope for cooperation in the development of strategies for renewable energy production, energy efficiency of existing buildings, transport, SME's and eco-innovation.</p> <p>Realisation of supporting actions having a "place-based" approach/territorial focus, which assist the regions and stakeholders especially in framing the implementation of energy infrastructure projects of European interest, can speed up the deployment of such infrastructure projects.</p> <p>Transnational cooperation may bring opportunities in the development of efficient and sustainable transnational infrastructures for renewable energy</p> <p>Very high wave power potential of the NWE region</p> <p>NWE is directly concerned by a number of European priority corridors for future infrastructure development in the field of electricity, gas and oil (e.g. North Seas Off-shore Grid)</p>	
Promoting climate change adaptation, risk prevention and management	<p>An EU-legal framework with objectives for CO₂ reduction and also national policies on CO₂ reduction are in place.</p> <p>A number of risk management networks and also (technical solutions) are in place in NWE (esp. river flooding).</p>	<p>NWE countries belong to the major polluters of the EU in terms of greenhouse gas emissions which contribute to global climate change: Germany, the UK and France have the greatest share in the total EU27 greenhouse emission.</p>	<p>Stronger exploration of "place-based" (or bottom-up) approaches which increase the mitigation capacity and especially the adaptive capacity in NWE, for increasing the fighting negative impacts of climate change (e.g. sea level rise, flooding,</p>	<p>Increase of natural risks due to climate change (e.g. sea level rise and increase of frequency & scope of extreme events such as coastal floods, river floods, urban floods, storm surges, heat waves and drought etc) and significant increase of cost to</p>

Sust. Growth	Strength	Weaknesses	Opportunities	Threats
	<p>NWE hosts an high concentration of regions with high mitigative capacity</p> <p>The Centre and North of Europe governance and population know very well how to react in case of a disaster actually taking place (high adaptive capacity). Therefore the "vulnerability" in NWE is low, except for a few exceptional mainly coastal regions in Netherlands, Belgium, France and UK.</p>	<p>NWE is already exposed quite often to extreme natural events (e.g. coastal floods, river floods, storm surges, heat waves, drought etc) which have significant negative impacts on the areas affected,</p> <p>Weaknesses in national/regional governance of risk still exist in NWE.</p> <p>NWE is the region where the urban vulnerability to flood events is the highest in Europe</p>	<p>heavy weather incidents).</p> <p>Explore the commercial opportunities of efficient solutions existing in NWE, for transferring those to the rest of the EU and even world-wide (in relation to OT1 and 3)</p>	<p>eliminate the damages caused by such events, especially in the NWE countries and regions most affected (Netherlands, Belgium, France, the UK & Ireland).</p> <p>The NWE coastal regions present a remarkably high potential physical impact as a result from climate change, which relates to the density of physical structures such as settlements, transport infrastructure, thermal power plants and refineries in these areas that are mainly sensitive to extreme events</p>
Protecting the environment and promoting resource efficiency	<p>NWE has a good history of water management expertise that can also be transferred EU-wide and globally.</p> <p>For the reducing landfill of biodegradable municipal waste, most of the NWE countries had already met the 2016 target in 2006 (DE, CH, BE, LU, NL) and France was already close by.</p> <p>Better than average systems & technologies for waste management exist in NWE.</p> <p>Annual growth of land taken up for urban residential areas and for economic sites was clearly below the European average only in BE.</p> <p>Lower degrees of soil sealing in the UK, France, Switzerland and especially in Ireland.</p> <p>In the countryside, high levels of landscape diversity in several areas of</p>	<p>NWE countries belong to the major polluters of the EU in terms of air pollution. All NWE-countries reported NO_x emissions higher than their Gothenburg ceilings 2010. Poor air quality results in health problems (respiratory diseases) especially in the densely populated areas.</p> <p>Pollution of rivers and lakes and other freshwater resources is still an important issue in all NWE countries, because of intensive agriculture and an increased economic activity.</p> <p>Except Belgium, all NWE countries were in 2010 either significantly (CH, LU, IE) or still clearly (NL, DE, UK, FR) above the European average in terms of municipal waste generation.</p> <p>Annual growth of land taken up for urban residential</p>	<p>To address the challenge of increasing urban land use and growing soil sealing as well as of a further fragmentation of landscapes and of a loss of biodiversity in NWE, large-scale and/or place-based integrated policy approaches can be designed which help to balance sector demands on land and to manage land use in a sustainable manner, both in the urbanised and in the less urbanised areas.</p> <p>Biodiversity should also be increasingly addressed in an urban context, because NWE hosts many cities with low public urban green areas and/or green hinterlands.</p> <p>Creating more "place-based" solutions for a promotion of resource efficiency (development, piloting & testing).</p> <p>Better use of waste</p>	<p>Further deteriorating air quality due to further increase of intensive agriculture of economic activity population and of individual passenger traffic and terrestrial freight transport.</p> <p>Increasing urban sprawl.</p> <p>Regional disparities and urban rural differences are increasing, contributing to negative spatial development trends, despite policy frameworks to achieve better spatial balance and quality.</p> <p>Lack of policy efforts especially in the densely populated areas of NWE, leading to a further increasing pressure on the environment and/or a stronger deterioration of environmental quality. Further increase of raw material cost, having negative</p>

Sust. Growth	Strength	Weaknesses	Opportunities	Threats
	<p>the continental part of NWE (esp. Bretagne, Pays de la Loire, Belgium, Luxembourg, north-west and south-west of Germany). Presence of dissection elements in landscape is lower in Ireland and the UK. Positive for biodiversity. Good experience with natural resources management exists in NWE.</p> <p>High contributors to the Natura 2000 site network are the Benelux countries (in % of in their total terrestrial area).</p> <p>In DE, FR and NL, the strongest decrease of diffuse pressure from intensive agriculture on Natura 2000 sites is observed.</p> <p>Some regions have implemented good solutions for promoting resource efficiency which have a potential for transfer</p> <p>Within NWE, the percentage of waste that is recycled is slightly growing year by year.</p>	<p>areas and for economic sites was in most countries above the European average (NL, LU, IE) or close to it (FR, DE).</p> <p>Extremely high degree of soil sealing in Belgium, the Netherlands, Germany, Luxembourg (i.e. > 5% of the total land areas).</p> <p>In the countryside, levels of landscape diversity in the rest of NWE are low or even very low (esp. Ireland, UK, most of the Netherlands, major parts of France).</p> <p>Presence of dissection elements in landscape is high in Luxembourg, Belgium, France, the Netherlands and Germany. Here, a loss of biodiversity is existing.</p> <p>All other NWE countries – including also Switzerland (only national designated areas) – contribute at much lower levels to the Natura 2000 site network.</p> <p>Diffuse pressure from intensive agriculture & urbanisation on Natura 2000 sites was particularly strong in LU (EU-wide leading), but also at a significantly lower levels in FR, IE.</p> <p>NWE has a large stock of commercial, public and residential buildings older than 1974 with a low energy efficiency</p> <p>Strong urban dimension of the NWE area which is linked to specific urban climate phenomenae such as urban heat islands</p>	<p>for raw material recovery and energy production. Opportunities for new material development from waste.</p> <p>Pollution of rivers and lakes and other freshwater resources is still an important issue in NWE which should be addressed by transnational cooperation (flows)</p> <p>Transnational cooperation may be promising to the support of the transnational dimension of EU law and policies (e.g. cross border dimension of Natura 2000 sites, maritime spatial planning, water management)</p>	<p>impact on the economy and individual households.</p> <p>Further dependence on foreign material resources</p> <p>In the seas that form part of NWE (North Sea, Channel area, Irish Sea, Atlantic), the observed and projected increases in sea surface temperature will lead to the northward movement of species and changes in the distribution of phytoplankton biomass</p> <p>Increased health problems due to water, air and soil pollution, affection especially marginalised populations</p> <p>Urban land use deserves special attention in NWE, because most human activities are concentrated in its metropolitan areas and cities and demand for the urban land-use patterns have a particular impact on the environment</p>

Sust. Growth	Strength	Weaknesses	Opportunities	Threats
Promoting sustainable transport & removing bottlenecks in key network infrastructures	<p>Transport is of vital importance for economic growth in NWE.</p> <p>High quality transport networks exist in NWE for all modes mostly in the core area (rail, road, air, sea, inland waterways). Innovative traffic management solutions are introduced in many NWE cities and also across parts of the transnational area which have a potential for further development and transfer.</p> <p>High level of accessibility of many of the NWE areas linked to the high levels of urbanisation and concentration of population</p>	<p>Transport is a major source of pollution and CO₂ emissions in NWE.</p> <p>NWE remains heavily reliant on road transport.</p> <p>The motorisation rate is above or clearly above the EU27 average in larger parts of NWE</p> <p>The infrastructure density is lower in the more peripheral or rural regions of several NWE countries.</p> <p>The existing road infrastructure in NWE is heavily congested especially in the core area, because the dominant mode for freight transport is the road and because individual car use is still the dominant pattern of transport of persons. Negative effects of road congestion materialise especially in the most urbanised areas of NWE.</p> <p>Public transport and other non-motorised traffic modes are proportionally less important in NWE.</p> <p>Transport is very low on the priority list of the EC for use of structural funds in NWE countries</p> <p>There are areas in NWE with quite a low accessibility. These areas can mainly be found in less populated and remote areas such as Normandy, Scotland and Ireland.</p>	<p>Developing a common governance strategy in NWE for secondary networks.</p> <p>Explore opportunities for a “de-growth” of traffic in NWE: More efficient traffic management on major transport axes and in the major urban agglomerations of NWE for reducing congestion.</p> <p>Encouragement of a stronger shift towards more environmentally friendly modes in the field of freight transport (rail, inland waterway transport) and passenger transport (public transport). Exploring new opportunities for expanding “slow traffic” especially in urban areas of NWE.</p> <p>Transnationality may be promising for the facilitation of seamless mobility across NWE (e.g. through integrated ticketing services)</p>	<p>Transport remains a major source of pollution and CO₂ emissions in NWE.</p> <p>Further increasing CO₂ emissions and overall economic losses in NWE due to increasing transport and traffic congestion.</p> <p>Increasing population growth especially in the urban areas of NWE and increasing congestion in these areas.</p>

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

Inclusive Growth	Strength	Weaknesses	Opportunities	Threats
Promoting employment and supporting labour mobility	<p>High regional employment rates in major parts of NWE & medium-high employment rates esp. in France and Ireland (2010). Relatively little changes of regional employment rates on the continental part of NWE during the immediate crisis period (2008-2010).</p> <p>Existence of specific policy measures in all NWE countries addressing specific target groups being excluded from the labour market or having difficulties in terms of job integration.</p> <p>Well developed transport infrastructure, helping especially people in rural or more remote areas and border areas to access job opportunities.</p> <p>Long-standing labour market integration in NWE, favouring comparatively high levels of cross-country labour mobility and bringing NWE also at a first place in the EU with respect to cross-border commuting intensity (volume of commuter flows).</p>	<p>Some geographical "hot-spots" with low regional employment rates esp. in northern France & southern Belgium (2010). Strong changes of regional employment rates esp. in Ireland and the UK during the immediate crisis period (2008-2010).</p> <p>Existence of specific social target groups being excluded from the labour market or having difficulties in terms of job integration (e.g. long-term unemployed, less qualified young persons, elderly, women wanting to return into jobs, disabled etc)</p> <p>Demographic change leads already now to a beginning shortage of a skilled & highly qualified labour force in several NWE countries and regions.</p> <p>High CO₂ impact of individual car use to reach workplaces (domestic & cross-border workplace commuting)</p> <p>Various hurdles hampering a more widespread transnational and cross-border labour mobility in NWE (i.e. lack of widespread foreign language proficiency, cultural-mental barriers, lack of information, different legal provisions on social & fiscal matters or with respect to a recognition of diploma etc).</p> <p>Employment policy</p>	<p>Gaining new workforce potentials through focussed action on certain person groups: Better integration into work of specific target groups which are currently not yet active in several countries or regions of NWE (women & elderly). Targeted action towards a reduction of youth unemployment, especially in the regions being most affected..</p> <p>Attractiveness and dynamism of the NWE economy as a good asset for attracting skilled & qualified labour force ("brain-gain") from "outside".</p> <p>Some effects of demographic change can be used as a source for developing new employments. This is particularly relevant for an aging population the development of targeted services for the elderly (e.g. the "silver economy").</p> <p>More use of ITC to stimulate distance work facilities especially in rural and remote areas.</p> <p>Potentials for further increasing the transnational and cross-border labour mobility in NWE. Potential to compensate a shortage of labour force through new/additional inward migration from non NWE-areas</p> <p>Specific opportunities for the development of a transnational approach</p>	<p>Risk of social dumping and increase of the "working poor" phenomenon (i.e. the salary from one job is not sufficient any more for earning one's living).</p> <p>Continuation or even further increase of the share of the active population being excluded from the labour market.</p> <p>Decreasing availability of qualified workforce in NWE (i.e. growing shortage of skilled labour force & especially of highly qualified labour force) and increasing pressure on the NWE economy (insufficient supply of skilled & highly educated personnel).</p> <p>Unfavourable cost-benefit relation hindering a further roll-out of ICT infrastructures and services especially in rural and remote areas.</p> <p>Hurdles for both general transnational labour mobility and cross-border commuting persist and hamper the development in NWE.</p>

Inclusive Growth	Strength	Weaknesses	Opportunities	Threats
		is considered a more nationally dominated policy area	include: entrepreneurship education, pre-employment training, removing barriers for a transnational labour market.	
Investing in education, skills & lifelong learning	<p>Generally well-developed educational system, allowing persons to access education mostly on a cost-free basis (primary & secondary education).</p> <p>In the largest part of NWE, the regional shares of students aged 17 years continue education (above the EU27 average of 88% or with 80-87.5% relatively close to this average).</p> <p>Generally well-developed disposition of the population to engage in lifelong learning in CH, NL and UK.</p> <p>Well-developed educational system which allows persons to access education mostly on a cost-free basis (pre-primary, primary, secondary, tertiary education). Also existence of many world class universities. Historically high levels of investment in higher education.</p> <p>Very high level of participation in pre-primary education (nearly full inclusion of smaller children aged 4) and also generally high shares of the NWE population which have successfully completed tertiary education. Also fairly good situation as regards an early leave from education and training.</p>	<p>In several NWE countries the professional education and training systems already require further improvement.</p> <p>In England and Wales, the level of students aged 17 years continuing education is clearly below the EU27 average.</p> <p>Less well-developed disposition of the population to engage in lifelong learning in IE, FR, LU, DE and BE.</p> <p>Certain regions and cities with big universities or other tertiary education facilities attract talent (monocentric development): NWE-internal "brain drain" to stronger regions.</p> <p>The current participation in upper secondary and post-secondary non-tertiary education as well as in tertiary education is in larger parts of NWE mostly at an around EU27 average performance. Only a few areas stand out with a clear above EU27 average performance.</p>	<p>Potential for adapting educational system to the requirements of a knowledge society & knowledge economy.</p> <p>Good potentials in most of NWE to meet the skills requirements of a knowledge society & knowledge economy.</p> <p>Potential for further increasing lifelong learning in IE, FR, LU, DE and BE.</p> <p>Further inter-linkage and networking among existing (world class) universities to foster the basis for generating the "grey potential" that is necessary for a knowledge-based society and economy in NWE.</p> <p>Further stimulating participation in upper secondary and post-secondary non-tertiary education, especially in NWE areas currently underperforming.</p> <p>Potentials for further increasing the mobility of students within NWE.</p> <p>Transnational cooperation would allow the opportunity to overcome competition over skilled labour, and instead develop joint strategies to support labour mobility of skilled workers into the NWE area or between NWE regions to balance shortages.</p>	<p>Lack of public funds for adapting educational system to the requirements of a knowledge society & economy, due to growing public indebtedness.</p> <p>Growing non-involvement in lifelong learning.</p> <p>There are considerable differences in levels of education across NWE, which may further the risk of social inequalities and exclusion</p> <p>Reduced investment in higher education due to public funding limits. Demographic changes might place pressure on higher education systems.</p> <p>Increasing "brain-drain" away from NWE, benefiting other parts in Europe and especially other Third Countries (e.g. USA).</p> <p>Reduction of participation in upper secondary and post-secondary non-tertiary education (& further geographical polarisation) and increase of early leave from education and training, representing a risk for developing a knowledge-based society and economy in NWE.</p> <p>Increasing NWE-internal "brain-drain".</p> <p>In an ageing and shrinking NWE, economic growth will depend more and more on the</p>

Inclusive Growth	Strength	Weaknesses	Opportunities	Threats
	Long-standing free movement of persons in NWE stimulating mobility of students.			availability of skilled labour and countries or regions may start competing against each other to obtain it.
Promoting social inclusion and combating poverty	<p>Existing systems of social protection & social assistance still fulfilling their social integration function.</p> <p>Dense network of non-governmental and voluntary organisations ensuring a complementary integration function.</p> <p>Attractiveness of NWE for immigration from non-EU countries</p>	<p>Poverty is present in NWE, albeit at different levels within the countries and across regions.</p> <p>In most NWE countries, poverty and social exclusion is highly visible in the larger urban areas (and here often concentrated in problematic neighbourhoods), but less pronounced or probably more hidden in the rural areas town and suburbs.</p> <p>Partly successful integration of the population from non-EU countries into work and/or the wider society.</p> <p>Social policy is considered a more nationally dominated policy area.</p>	<p>Greater awareness about urban and rural poverty and exclusion phenomena and better tackling of the respective problems</p> <p>Mobilisation of new workforce potentials through a better integration of the population from non-EU countries</p> <p>Health care is an important sector in terms of employment and innovation</p>	<p>Significant cut-backs in social protection and social assistance systems in NWE (financial & scope of services), due to the effects of growing public indebtedness.</p> <p>Further increase of the "living poor" phenomenon, leading to social exclusion already before the working age is reached (children) and also after a retirement from work has taken place (elderly persons).</p> <p>Risk of increasing violence and other unwanted extreme phenomena in the society (e.g. criminality, youth gangs, "no-go areas", xenophobia & racism etc)</p> <p>Fragile and at-risk populations are more vulnerable to health problems, especially those generated in urban environments</p>

5.1.4 Main Challenge and Needs

Table 5.4: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	<p>Excellent world-class R&D infrastructure and high R&D intensity:</p> <p>High and very high levels of human resources employed in science and technology</p>	<p>High disparities among NWE regions in total intramural R&D expenditure and output</p> <p>Employment in Knowledge Intensive Services is concentrated around large city regions</p>	<p>All NWE countries have a sector/cluster oriented strategy for innovation.</p> <p>Smart specialisation can be a tool for a further raise of R&D spending in NWE regions</p>	<p>Brexit poses a significant threat to interregional value chains.</p> <p>Pronounced regional disparities.</p>

	Strengths	Weaknesses	Opportunities	Threats
Sustainable growth	On the production side, the share of renewables has increased vastly in DE, LU. On the consumption side, the share of renewable is still limited in NWE and in all countries – except France	The existing road infrastructure in NWE is heavily congested especially in the core area, because the dominant mode for freight transport is the road and because individual car use is still the dominant pattern of transport of persons.	“de-growth” of traffic in NWE: More efficient traffic management on major transport axes and in major urban agglomerations of NWE for reducing congestion.	Further increasing CO ₂ emissions and overall economic losses in NWE due to increasing transport and traffic congestion. Increasing population growth especially in the urban areas of NWE and increasing congestion in these areas.
Inclusive growth	Well-developed educational system: mostly access on a cost-free basis (pre-primary, primary, secondary, tertiary education). Existence of many world class universities. Historically high levels of investment in higher education.	In several NWE countries the professional education and training systems already require further improvement. NWE-internal “brain drain” to stronger regions.	Further stimulating participation in upper secondary and post-secondary non-tertiary education, especially in NWE areas currently underperforming. Potentials for further increasing the mobility of students within NWE	Decreasing availability of qualified workforce in NWE and increasing pressure on the NWE economy

Strengths

Excellent world-class R&D infrastructure and high R&D intensity: NWE hosts many regions of the EU which have surpassed the European target value of 3% in R&D expenditure (10 out of 24) and also a number of others which are close to the target. Also high and very high levels of human resources are employed in science and technology, especially on the continental part of NWE.

On the production side, the share of renewables has increased vastly in DE, LU. On the consumption side, the share of renewable is still limited in NWE and in all countries – except France – below the EU27 average. Scientific solutions exist in NWE, but also concrete examples for a more “place- based” (local) and cheaper energy provision through a use of renewable energy sources.

A well-developed educational system which allows persons to access education mostly on a cost-free basis (pre-primary, primary, secondary, tertiary education). Also existence of many world class universities. Historically high levels of investment in higher education.

Weaknesses

Despite the high performance of NEW regions in R&D, disparities exist among NWE regions in total intramural R&D expenditure. A general dichotomy can be observed among NWE regions between innovation leaders and innovation followers. The disparities can also be observed on territorial scale: employment in Knowledge Intensive Services is concentrated around large city regions.

The existing road infrastructure in NWE is heavily congested especially in the core area, because the dominant mode for freight transport is the road and because individual car use is still the dominant pattern of transport of persons. Negative effects of road congestion materialise especially in the most urbanised areas of NWE. Public transport and other non-motorised traffic modes are proportionally less important in NWE.

In several NWE countries the professional education and training systems already require further improvement and updating to ensure coherence between education system outputs and demands in the labour market. . Certain regions and cities with big universities or other tertiary education facilities attract talent (monocentric development), leading to an NWE-internal “brain drain” to stronger regions.

Opportunities

All NWE countries have a sector/cluster oriented strategy for innovation. In some cases, these are developed at the regional level. The NWE programme may promote excellence and synergy by matching regional innovation approaches and connecting clusters from the bottom up. Promising avenues for transnational cooperation in NWE to improve smart growth thus include economic relations between knowledge clusters across NWE.

Exploration of opportunities for a “de-growth” of traffic in NEW to counteract congestion and pollution in urban centres. More efficient traffic management and multimodal transportation can be employed on major transport axes and in the major urban agglomerations of NWE for reducing congestion.

Further stimulating participation in upper secondary and post-secondary non-tertiary education, especially in NWE areas currently underperforming is needed to reduce the incidence of lagging regions (in the context of the development of the programme area).

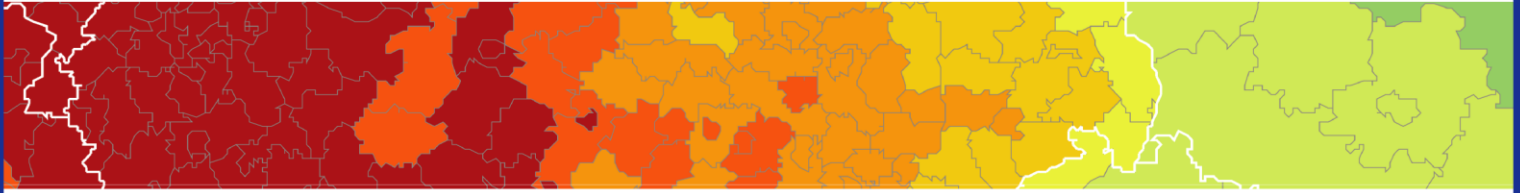
Threats

The knowledge intensive economy in the NWE is important, but is under strain from the lasting effects of the economic crisis and reductions in investments. Brexit poses significant threats due to the disruption of value chains, which can detrimentally affect the regional economy. Further, there are significant regional differences which seem to be increasing in knowledge intensive services, innovation potential, and innovation performance. Continuing public indebtedness crisis and problems of the EU banking sector might lower public and private R&D spending, hampering growth potentials.

Further increasing CO₂ emissions and overall economic losses in NWE due to increasing transport and traffic congestion pose risks to public health and the environment. Increasing population growth and immigration especially in urban areas of NWE and increasing congestion in these areas, exacerbate these trends.

Decreasing availability of qualified workforce in NWE (i.e. growing shortage of skilled labour force & especially of highly qualified labour force) and increasing pressure on the NWE economy (insufficient supply of skilled & highly educated personnel) are combined with a signifi-

cant pool of long-term unemployed, creating large labour market imbalances. Unfavourable cost-benefit relations hinder a further roll-out of ICT infrastructures and services especially in rural and remote areas, thus increasing degree of regional divergence.



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

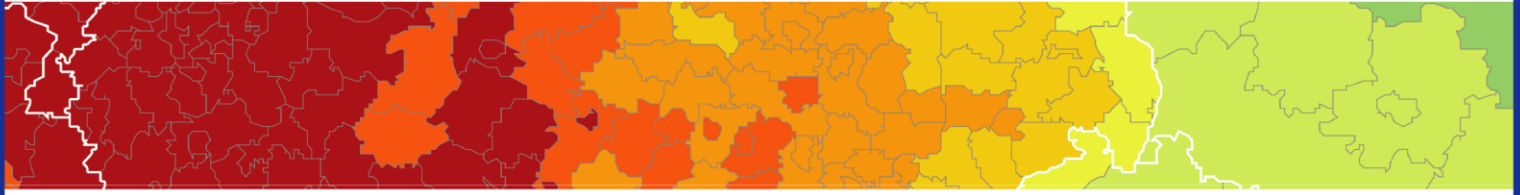
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG A Sweden-Denmark-Norway

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

**INTERREG A
Sweden-Denmark-Norway**

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview of needs and challenges	3
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	3
3 Indicators	6
3.1 Initial result and output indicators used in assessment	6
3.2 Proposed Key Territorial Indicators.....	10
4 Benchmarking.....	14
4.1 Gross Value Added in Knowledge-Intensive Sectors	14
4.2 Innovation.....	17
4.3 Tourism and Sustainability.....	20
4.4 Regional Scoreboards.....	23
5 Reference Analysis	25
5.1 Territorial specificity of the programme area.....	25
5.1.1 Smart Growth	25
5.1.2 Sustainable Growth.....	25
5.1.3 Inclusive Growth	26
5.1.4 Main Challenge and Needs.....	26
References	29

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	6
Figure 4.1: Regional Scoreboard.....	23

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	13
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	13
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	16
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors	19
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	22

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.	10
Table 5.1: SWOT Analysis Smart Growth	25
Table 5.2: SWOT Analysis Sustainable Growth.....	25
Table 5.3: SWOT Analysis Inclusive Growth.....	26
Table 5.4: SWOT Analysis Overall Challenges and Needs	26

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

The Öresund-Kattegatt- Skagerrak (ÖKS) Programme area includes the metropolitan areas of Copenhagen-Malmö, Gothenburg, and Oslo, as well as rural areas. There are over 9 million people living in the ÖKS area. The ÖKS area is characterised by good economy, high education level, and good connections to sea and nature. Put into a European context, the area has relatively low social differences, good welfare, strong economy, high quality education and research with more than 30 universities, and good consciousness of environmental and climate issues. There is a challenge of demography in the area with aging population, and with youth employment. At the same time, there is a tradition of transnational labour market in the Programme area.

The cooperation programme Interreg V-A Sweden-Denmark-Norway, or Öresund-Kattegatt-Skagerrak Programme (later: ÖKS) addresses the important cross-border challenges linked to the implementation of the Europe 2020 strategy in the dynamic cross-border region, which includes the metropolitan regions of Copenhagen-Malmö, Gothenburg and Oslo as well as rural areas. The programme will contribute to a strengthened cross-border research and innovation system capacity, linking it more strongly to the EU and international systems. The ÖKS Programme links Europe 2020 strategy with national plans and with the regional and local development plans.



In Denmark, the Programme area includes Copenhagen and its surroundings, Nordsjaelland, Bornholm, Ostsjaelland, Vest- och Sydsjaelland, Vestjylland, Ostjylland, and Nordjylland. In Sweden, the Programme area includes Skåne län, Halland län and Västra Götaland län, In Norway, the Programme area includes Oslo, Akershus, Ostfold, Buskerud, Vestfold, Telemark, Aust-Agder and Vest-Agder. The total budget of the ÖKS programme is € 255,093,931.00, out of which EU funding is € 127,546,965.00.

2.2 Contribution to EU 2020 strategy & situation in the programme area

The ÖKS cooperation programme addresses especially the cross-border challenges linked to the implementation of the Europe 2020 strategy in the dynamic cross-border region, which includes the metropolitan regions of Copenhagen-Malmö, Gothenburg and Oslo as well as rural areas. The ÖKS programme contributes to each of the following EU 2020 strategy pillars:

Smart Growth: The programme seeks to strengthen cross-border research and innovation system capacity. It includes the European Spallation Source ESS and the Swedish research facility MAX IV. The programme will also promote the commercialisation of innovations and increased business participation in the R&I sector and increase connectivity and cross-border mobility through the TEN-T network and other measures.

Sustainable Growth: The programme promotes the production of renewable energy, among other strategies by promoting innovation in renewable energy and by reducing energy consumption in the public sector.

Inclusive Growth: Self-employment, and employment in new companies and micro-enterprises will be promoted by the programme.

2.3 Overview of needs and challenges

The major needs and challenges in the region could be introduced as follows. Firstly, there are challenges of demography with ageing population, but at the same time the challenges in providing job opportunities to youth. Secondly, the recent downturn in private R&D investments has been remarkable. Thirdly, despite the opportunities provided by climate change, there are also environmental challenges to be faced by the Programme area. Low carbon economy transition needs research, innovation, new products, but also mindset and forerunners in the area. Fourthly, the challenges in organising an effective transportation system in the area are considerable. Advanced, coordinated transnational efforts are needed and play a key role, here. Finally, despite long tradition in integrating labour market in the ÖKS region, much more needs to be done in order to fully harness the potential of the region and its people – and to develop the ÖKS region in an inclusive way.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

The ÖKS programme is based on four major thematic objectives (TO, or “Tematiska Mål” in the Programme Document). A brief introduction to the specific objectives (SOs) is presented here (Please note: the Priority Axes of the ÖKS Programme are same as the TOs).

Specific objective 1.1: Increase the number of researchers cross-border/internationally in the strength areas of ÖKS

Priority Axis/TO: (TO 1, IP 1a)

- *Brief justification:* The main purpose is to increase the capacity for research and innovation in the European context
- *Main change sought:* The activities are expected to enable competence building especially in the fields that are important for the cross-border research infrastructure (ESS, MAX IV)
- *Expected activities:* public-private cross-border projects, activities that increase cross-border interaction within ÖKS area, demo projects and tests, activities that strengthen research infrastructure
- *Beneficiaries:* public sector, R&D environments, business life, education sector

Specific objective 1.2: Increase applied research & innovation activity in the KS region

Priority Axis/TO: (TO1, IP 1b)

- *Brief justification:* The main purpose is to increase private sector capability to utilise research results and competence and to increase the number of companies that participate in cross-border research projects.
- *Main change sought:* The relative share of the R&D out of regional GDP is expected to raise
- *Expected activities:* Promotion of implementing pilot, test and demo projects, promote private R&D investments, promote public sector innovation
- *Beneficiaries:* Public sector, R&D environments, Business life, Education sector

Specific objective 2.1: Increased number of cooperation to develop new renewable energy technology and methods

Priority Axis/TO: (TO 2, IP 4a)

- *Brief justification:* In order to reach the goals of low-carbon economy, new knowledge is needed. Also, the already existing knowledge should be used in a more effective way
- *Main change sought:* Production of renewable energy should be increased
- *Expected activities:* development of storing overflow of renewable energy,; development, test, demonstration facilities , competence building, consultancy
- *Beneficiaries:* public sector, private actors and branch associations, education organisations, non-profit organisations

Specific objective 2.2: Increase the share of renewable energy

Priority Axis/TO: (TO 2, IP 4a)

- *Brief justification:* need to further develop cross-border distribution network of energy , new innovation promotion measures in R&D
- *Main change sought:* higher share of renewables
- *Expected activities:* development of storing overflow of renewable energy, new development, tests, demonstration
- *Beneficiaries:* public sector, private actors, and branch associations, energy companies, education organisations, non-profit organisations

Specific objective 2.3: Reduced energy consumption in public activity

Priority Axis/TO: (TO 2, IP 4c)

- *Brief justification:* by co-operation, there is potential to energy efficiency methods and activities in public infrastructure, especially in buildings and construction sector, in the ÖKS cooperation
- *Main change sought:* energy efficient solutions, reduced energy consumption
- *Expected activities:* ÖKS cooperation in developing solutions, method; exchange of experiences, private-public cooperation, competence building
- *Beneficiaries:* public sector, private actors and related branch organisations, R&D institutions, education organisations

Specific objective 3.1: Promote better access to and through ÖKS region

Priority Axis/TO: (TO 3, IP 7a)

- *Brief justification:* Strongly related to Transeuropean TEN-T network, as ÖKS region has many TEN-T related transport corridors and facilities , activities should bring cross-border and even transnational/European added value

- *Main change sought:* Reduced transportation times , and optimal usage of road and rail-road under Nordic triangle of the TEN-T corridor
- *Expected activities:* new , better, and cross-border transportation for people and goods, promote the implementation of prioritised TEN-T projects relevant to ÖKS region
- *Beneficiaries:* national, regional, and local actors responsible for transport and infrastructure, private actors, branch organisations, R&D organisations

Specific objective 3.2: Reduce travel time with climate-friendly ways to TEN-T nodes

Priority Axis/TO: (TO 3, IP 7b)

- *Brief justification:* Improve and guarantee transport connections between secondary and tertiary networks and nodal points , targeted especially to more peripheral parts of region
- *Main change sought:* Reduced travel time between the chosen transport routes/nodal points within ÖKS
- *Expected activities:* new , better, and cross-border transportation for people and goods, activities to connect secondary nodal points to core network of TEN-T in ÖKS area
- *Beneficiaries:* national, regional, and local actors responsible for transport and infrastructure, private actors, branch organisations, R&D organisations; with emphasis on areas outside the leading transport routes/nodal points

Specific objective 3.3: Increase environment friendly transport work in chosen traffic corridors

Priority Axis/TO: (TO 3, IP 7c)

- *Brief justification:* To improve the prerequisites for sustainable and energy efficient transportation by reducing energy consumption and emissions of CO₂ and other air pollution
- *Main change sought:* Reduced energy consumption of the transport sector in the ÖKS region
- *Expected activities:* development of new methods, exchange of experiences, development of environmentally friendly transport corridors,
- *Beneficiaries:* public sector, private actors, non-governmental organisations, universities and R&D institutes

Specific objective 4.1: Promote increased employment in start-ups and micro companies

Priority Axis/TO: (TO 4, IP 8a)

- *Brief justification:* Importance to promote the dynamics of labour market in ÖKS by introducing new ideas and products also via start-up and small companies
- *Main change sought:* Increased employment in micro and SME companies in ÖKS region
- *Expected activities:* promotion of Incubator activities, trainings, consultancy, new cross-border networks in the field of entrepreneurship
- *Beneficiaries:* public sector, private actors, incubators, training institutes, social innovators

Specific objective 4.2: Increase the number of cross border commuters

Priority Axis/TO: (TO 4, IP 8e)

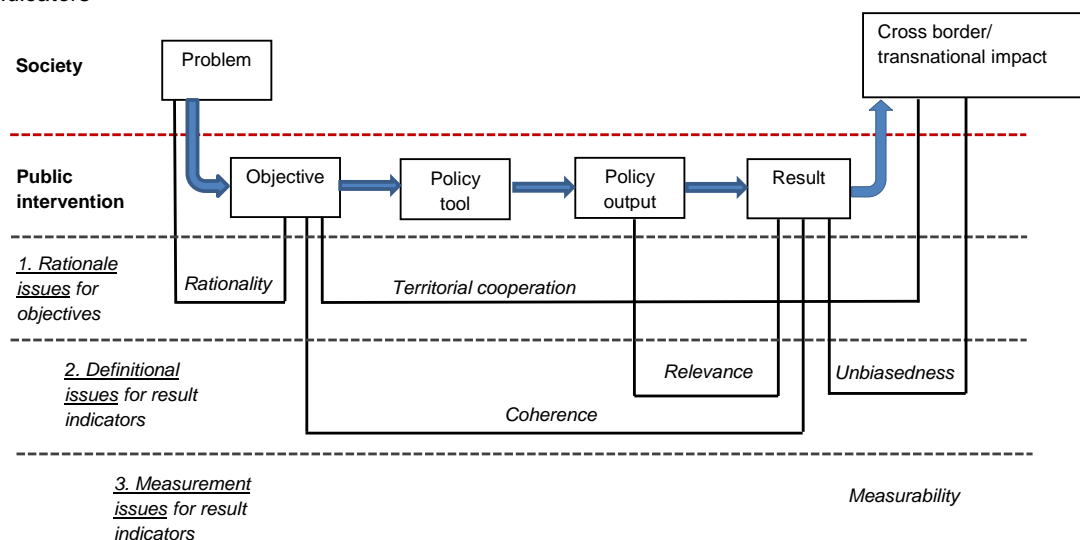
- *Brief justification:* utilise the cross-border potential of the labour market development in the ÖKS region
- *Main change sought:* increased commuting in the ÖKS region; harmonising and increasing cooperation between labour market responsible actors over the ÖKSD region
- *Expected activities:* cross-border matchmaking of the labour demand/supply, reducing the formal and informal hindrances for cross-border commuting, consultancy, new initiatives
- *Beneficiaries:* public sector, private sector, education institutes, labour officials in the ÖKS region

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
1	Increase the number of researchers active cross border/ internationally, cooperating with the industry and working in OKS (Øresund-Kattegat-Skagerrak) areas of strength	Researchers in R&D (Number of people)	HIGH	HIGH	HIGH	HIGH	LOW - Firms' investments in innovation could be influenced by other factors (exogenous economic shocks, level of human capital, etc)	HIGH
1	Increase the applied research and innovation oriented activity in the OKS (Øresund-Kattegat-Skagerrak) area	Percentage of R&D expenditure in % of the regional GDP (%)	HIGH	HIGH	HIGH	MEDIUM - The result indicator could consider also the supply of some research outputs	LOW - Firms' investments in innovation could be influenced by other factors (exogenous economic shocks, level of human capital, etc)	HIGH
4	Increase the share of renewable energy use (in relation to total energy consumption)	Share of renewable energy in relation to total energy consumption (%)	HIGH	HIGH	HIGH	HIGH	LOW - The use of green technologies is influenced by several other factors (oil price, availability of alternative sources of energy, etc.)	HIGH
4	Reduced energy consumption in the public sector	Energy consumption in public buildings (kWh/ m²)	HIGH	HIGH	HIGH	HIGH	HIGH	LOW - Official statistics do not provide these data, therefore comparability with other regions is limited
7	Improve the accessibility to and through the OKS (Øresund-Kattegat-Skagerrak) area	Rail transport time between TEN-T nodes in relation to road transport (Travel time by train in relation to the travel time by car in percentage)	HIGH	HIGH	MEDIUM - Reduction in travel time does not measure how many people will choose the fastest option (i.e. the optimal usage mentioned in the specific objective)	HIGH	HIGH	HIGH
7	Reduce the transport time with environmentally friendly forms of transport for people and goods to the nearest TEN-T node	Rail transport time between TEN-T nodes in relation to road transport (Travel time by train in relation to the travel time by car in percentage)	HIGH	HIGH	HIGH - Compared with the previous objective, in this case the goal is just a reduction of travel time	HIGH	HIGH	HIGH
7	Increase the environmentally friendly transport in selected corridors, including the core TEN-T network as well as around urban areas	The transport sector's energy consumption in relation to GDP (Tonnes (tonnes oil equivalent) per million of regional GDP)	MEDIUM - This objective is partially overlapping the previous two	HIGH	HIGH	HIGH	LOW - The use of green technologies is influenced by several other factors (oil price, availability of alternative sources of energy, etc.). Moreover, the achievement of this result can be influenced by the actions undertaken under the previous two objectives	LOW - Official statistics do not provide these data, therefore comparability with other regions is limited
8	Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of employees in enterprises with 1-9 employees (Number of employees)	HIGH	HIGH	HIGH	HIGH	LOW - New firms' creation is influenced by several other factors (institutional framework, population density, etc.).	HIGH
8	Increase the number of cross border commuters	Number cross border commuters in the OKS (Øresund-Kattegat-Skagerrak) area (Number of people)	MEDIUM - This objective is partially overlapping the three on transport infrastructures	HIGH	HIGH	HIGH	LOW - The result indicator has to be controlled for other factors (e.g. economic trend, etc.) and also for the results of actions on other specific objectives (e.g. reduced travel time)	HIGH
4	Increased number of cooperations for the development of new technologies, new control instruments and methods to promote an increased production of renewable energy	Production of renewable energy (Tonnes (tonnes oil equivalent))	MEDIUM - This objective is partially overlapping objective (3)	HIGH	HIGH	HIGH	LOW - The production of renewable energy is influenced by several other factors (oil price, availability of alternative sources of energy, etc.), but also by the result of policy action on obj (3), since a higher demand is expected to increase the supply	HIGH

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

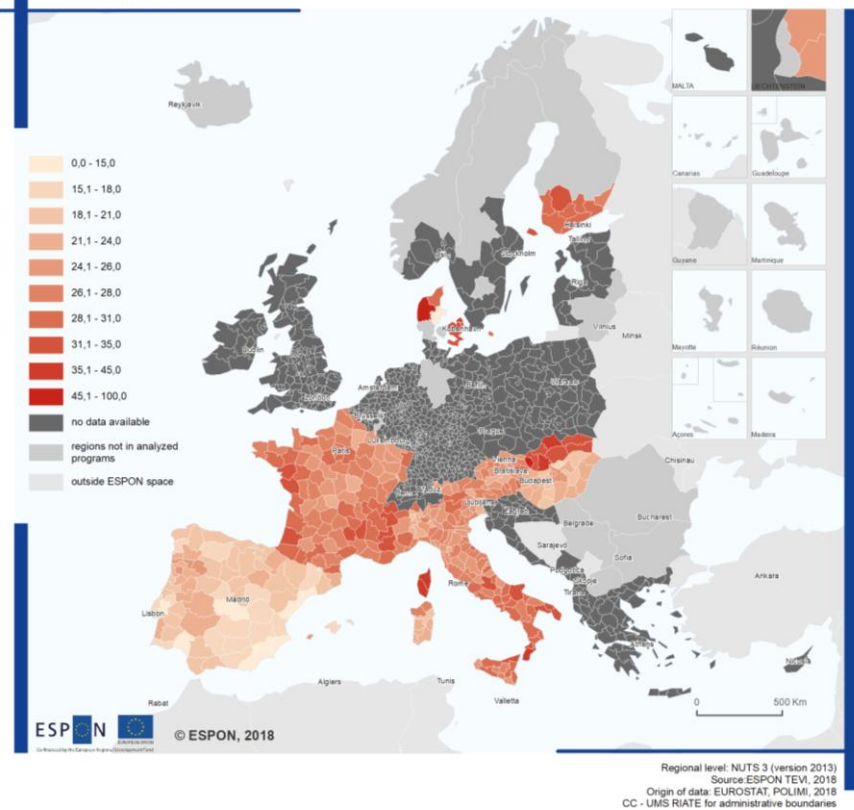
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Programme	Thematic objective	Specific objective	Result indicator	Proposed result indicator
SE-DK-NO(2)	1	Increase the applied research and innovation oriented activity in the ÖKS (Öresund-Kattegat-Skagerrak) area	Percentage of R&D expenditure in % of the regional GDP (%)	Synthetic indicator: Percentage of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
SE-DK-NO(5)	7	Improve the accessibility to and through the ÖKS (Öresund-Kattegat-Skagerrak) area	Rail transport time between TEN-T nodes in relation to road transport (Travel time by train in relation to the travel time by car in percentage)	Overall reduction in travel time spent by travellers (n. of travellers who shifted from car to train x average time saved)
SE-DK-NO(8)	8	Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of employees in enterprises with 1-9 employees (Number of employees)	Synthetic indicator: number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees

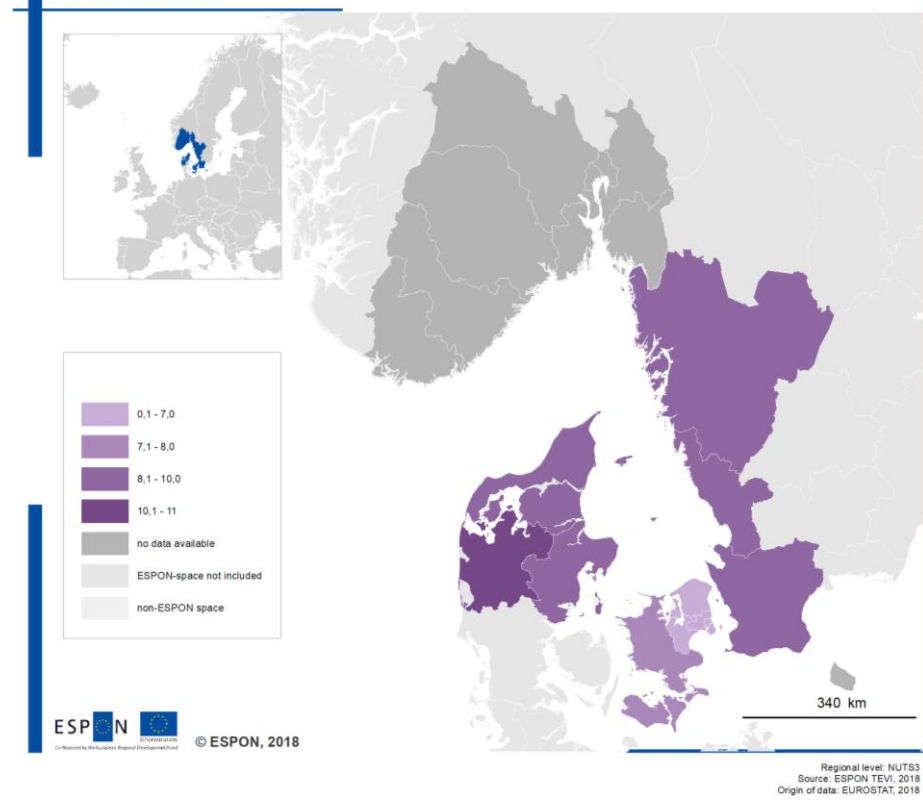
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)

Composite Indicator: patent applications + trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined timeperiod. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. A minimum of 1.5 can be observed, with corresponding maximum of 152.6. Maxima are found along urban centres, for example between Copenhagen and Malmö.

The programme area is performing very strongly overall on this synthetic indicator, which is not surprising, given the background of several of the regions in knowledge-intensive industries. The highest measurement score is displayed by the Skåne region in Southern Sweden – together with the Copenhagen area they form a cross-border cluster in many knowledge-intensive sectors, notably pharmaceuticals. Västra Götaland – the Gothenburg area in Sweden – is similarly a long-standing world-class industry cluster in the car manufacturing indus-

⁶nama_10r_3gva

⁷nama_10r_3empers

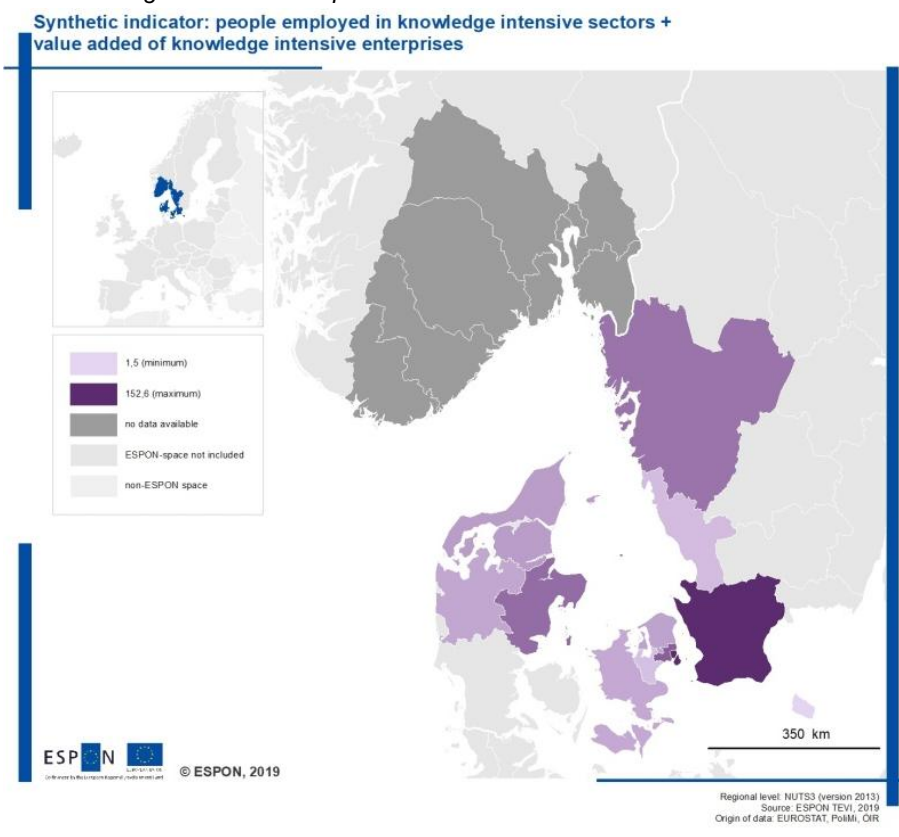
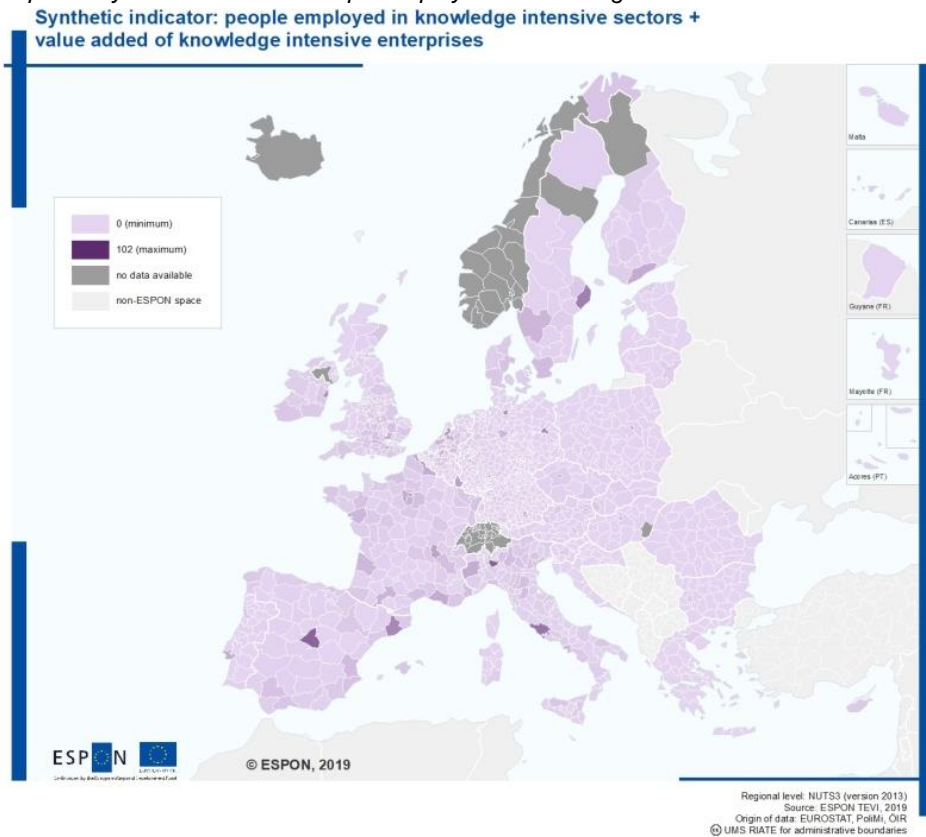
try, among others. These centres of R&D&I attract clusters of smaller companies as suppliers and collaborators. The role of universities is not to be underestimated as nodes around which the different actors in the innovation systems gravitate and strengthen their collaborative efforts. Regional and local authorities also play an important role in enabling a continuously attractive business environment for knowledge-intensive sectors and for start-ups to form.

It is also worth highlighting that most Danish regions that are part of the programme area comparison score highly – this is not surprising when considering the long-standing reliance and focus of the Danish economy on start-ups and an agile labour market. It is therefore easy to conceive that the Danish regions could score well on this indicator, which due to its synthetic nature lifts up such regions where the focus on knowledge intensive industries is truly cross-cutting.

A particular opportunity for the programme area arises from the relatively short distances as well as the existing links in both in culture and in transport infrastructure; these elements enable interregional synergies and cross-fertilization of ideas and knowledge-intensive networks across the entire programme area. The finding that the entire programme area is well advanced on this synthetic indicator is fully in line with that collaborative potential. Another important dimension here is collaboration between universities, which as mentioned are important hubs in innovative regional networks – there is potential to expand and consolidate such networks even more through increased connections and joint initiatives among the leading universities in the programme area.

The advanced standing of the programme area when measuring this synthetic indicator is evident when observing the European-level map. While the scores across Europe are relatively homogenous, the programme area clearly hosts an agglomeration of high-scoring regions. Other Nordic regions which are clearly doing very well include the Stockholm and Helsinki regions, with especially the former clearly standing out in the map. This finding is not surprising given Stockholm's reputation as a European start-up hub with high availability of venture capital and diverse innovation system with both a large presence of existing sectors and conglomerates and a big field of emerging and growing start-ups.

Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises



4.2 Innovation

The maps below present the synthetic composite indicator *Innovation* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Innovation in the framework of the indicator is restricted to technical innovation via patent and trademark registration, thus not necessarily reflecting the status of social innovations. The composite indicator quantifies the innovation outputs undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework innovative economic activities. The indicator is calculated in the following manner:

$$Innovation = \frac{1}{2} * P_{i,t} + \frac{1}{2} * T_{i,t}$$

In which the variable $P_{i,t}$ represents normalised patent application values per NUTS-3 region to the European Patent Office in region i and at time t . Analogously, $T_{i,t}$ represents normalised trademark applications in a given region i and at time t . Thus, the indicator captures scientific and technical innovation, in addition to capturing process innovation via new products and similar by companies. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Trademark values on NUTS-3 level are obtained via the indicator European Union trade mark (EUTM) applications by NUTS 3 regions⁹.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 3.6 can be observed, with corresponding maximum of 131.7. Minima are located in comparably rural areas, such in Finnmark. Maxima are found along urban centres, for example NUTS-3 regions Arhus, Copenhagen, and Malmö.

The pattern for how the programme area scores on the synthetic indicator on innovation seems to follow closely the industrial background of the different regions of the programme area. As highlighted above, two of the most well-established knowledge-intensive innovation

⁸ tgs00041

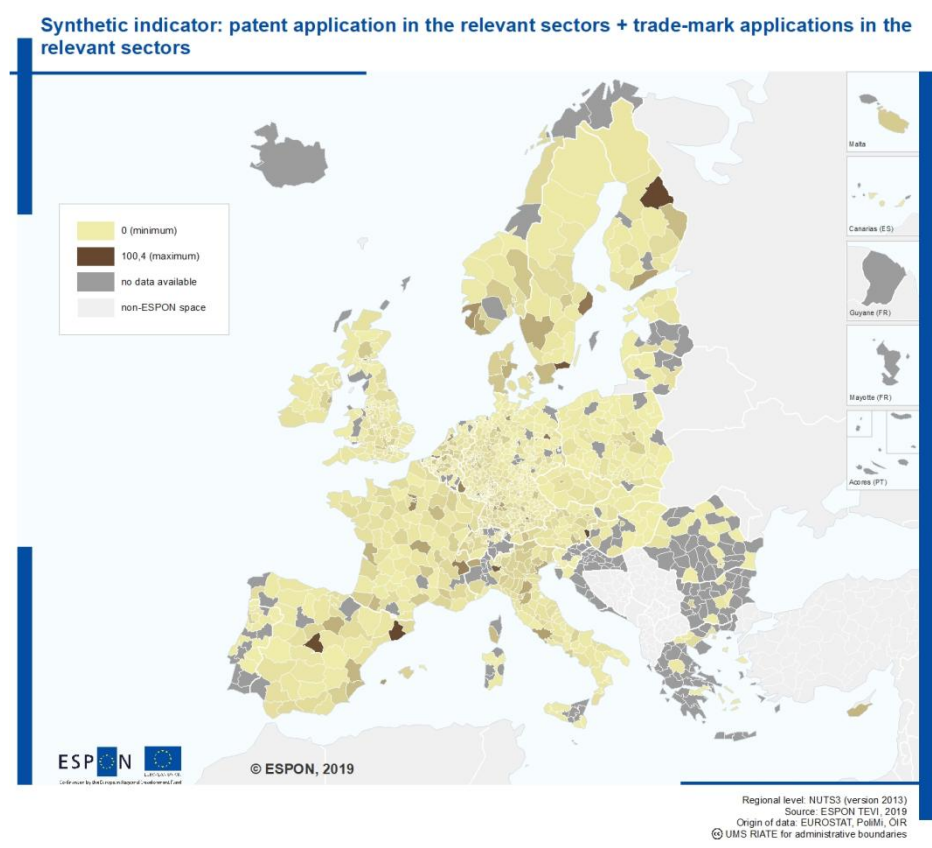
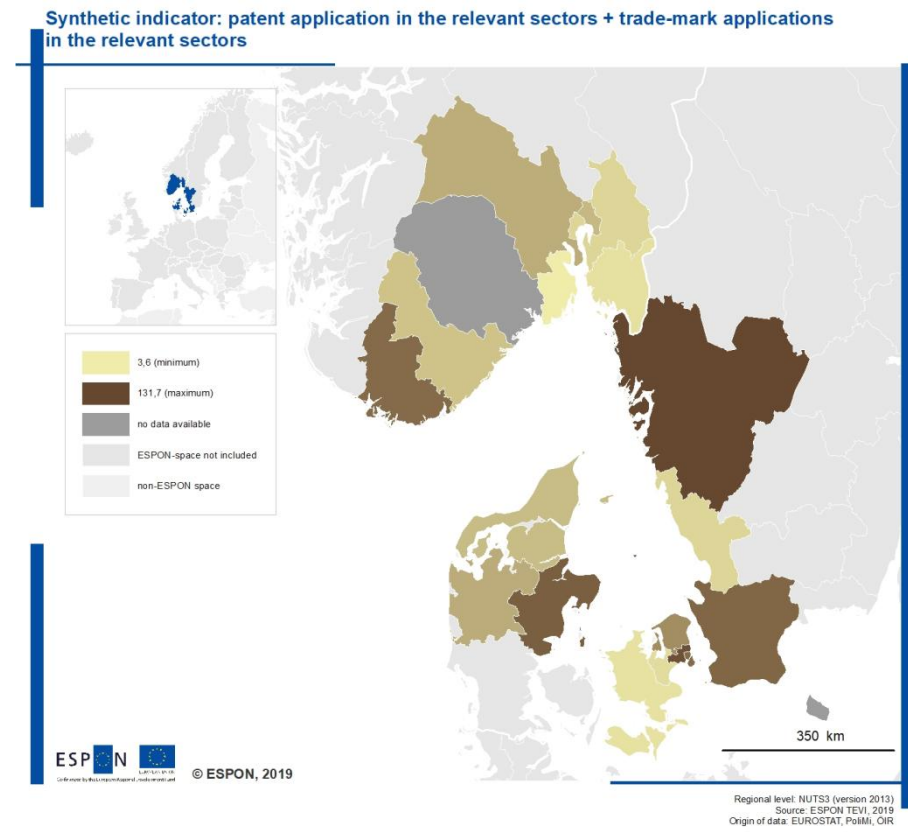
⁹ ipr_ta_reg

systems in all of the Nordic countries are found, on the one hand, in the Copenhagen/Malmö regions in Denmark and Sweden with specific focus on pharmaceuticals, and in Västra Götaland, the Gothenburg area, with a specific focus on car manufacturing and other technology-intensive industries. The key private actors in these clusters have developed well-organised testing and laboratory practice, which also involve universities, smaller companies and other stakeholders, and regional patterns in patent and trademark applications can thus be expected to have matured and been formalised over many decades.

Other regions in the programme area, in Denmark and in the southern tip of Norway, also score highly on the synthetic indicator. This can likely be an effect of similar gradual maturing processes of local industry as above, in fields such as energy technology or the oil and gas sector. The presence of universities and research facilities, as well as public sector R&D&I support and activity in initiating collaborative projects, may also have a deciding role.

When viewing the interregional disparities within the programme area it is important to also stress that not all regions with a well-developed innovation system may necessarily score highly on the synthetic indicator on patent applications – this depends on the dynamic between the actors within the innovation system, on how important and/or common patenting practices are in a given industry-sector, and on what the region's and its firms' established norms are in terms of patent application processes. In other words, a high measure on the synthetic indicator tells of a highly advanced knowledge-intensive economy, but a lower score does not unequivocally imply inferior or less-developed innovation systems. This is also worth keeping in mind when viewing the Europe-wide map, where very clear heterogeneities can be difficult to discern; the programme area's regions seem to make up an agglomeration that does very well, which is very promising and also underscores the potential for collaborative efforts in the innovation domain within the programme area. At the same time it is wise not to draw unequivocal conclusions on comparisons to trends in other parts of Europe, but to note that the patterns seem well in line with the strong international research reputation of the areas encompassed by the programme area.

Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors



4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies the development in tourism and sustainability undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations and inverted. The indicator stems from Eurostat and is available in monthly intervals at national level¹⁰. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹¹ is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹². This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 3.6 can be observed with corresponding maximum of 200. The minimum is located in the urban centre of Malmö. Maxima are found in the Danish NUTS-2 Province Hovedstaden.

While the minima and maxima are quite heterogeneous, it can nonetheless also be observed that there is no definitive regionalised divides in the values across the programme area. The centre point is the Copenhagen area as a regional tourism hub as well as a transport hub.

¹⁰ tour_occ_nim

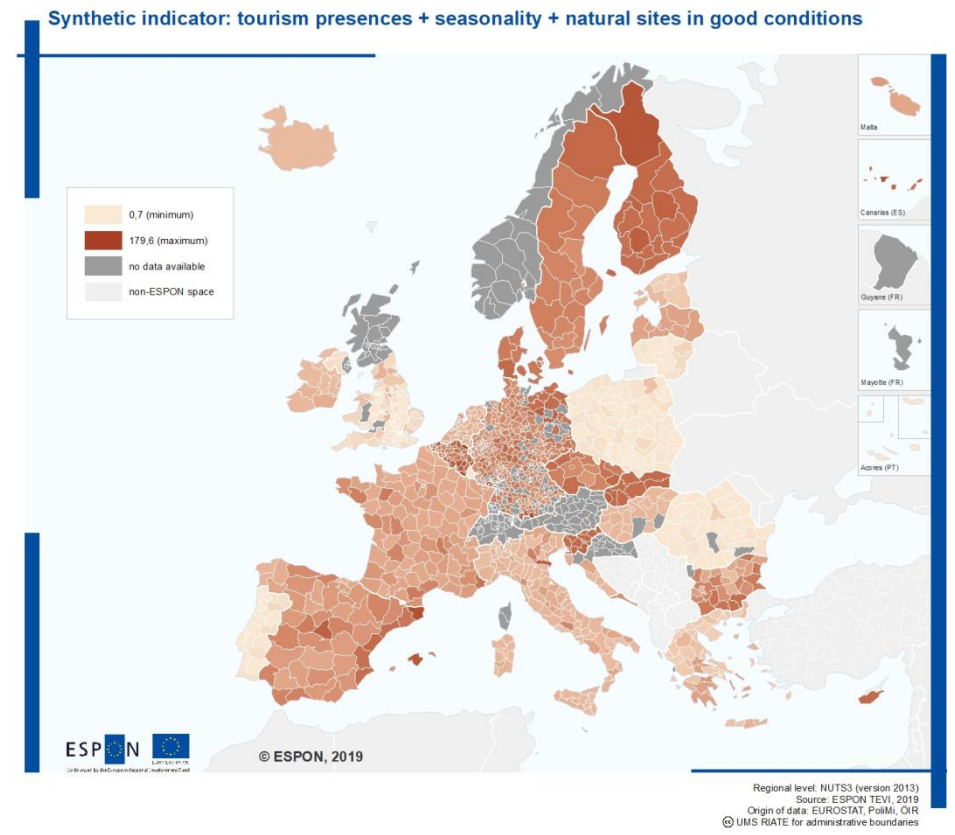
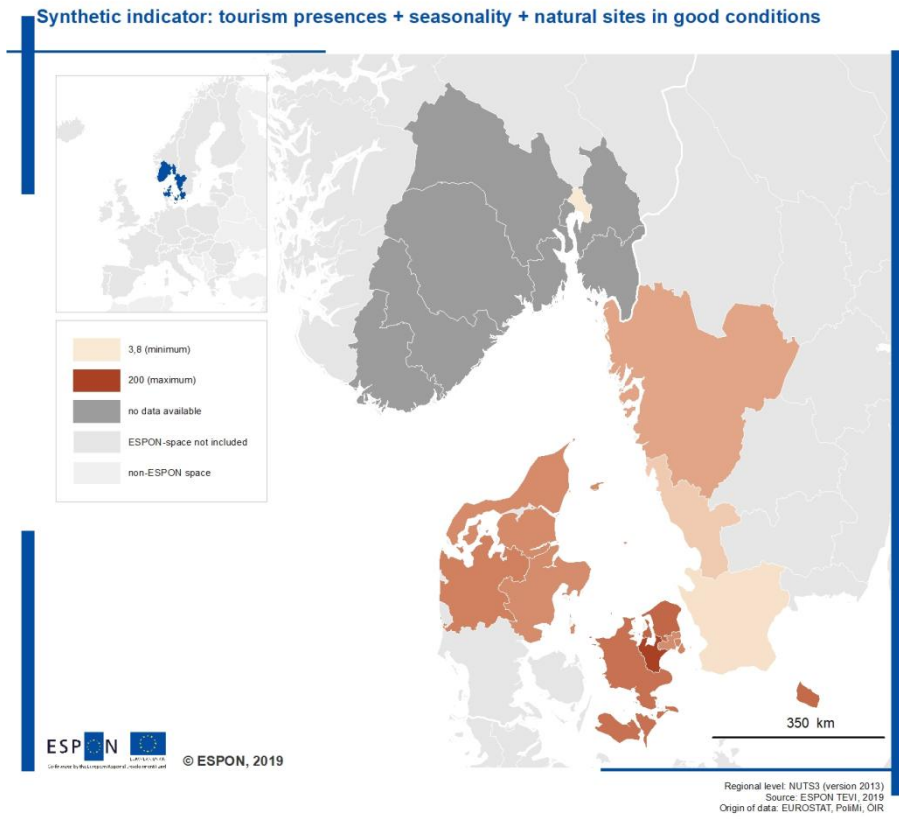
¹¹ Source: EEA, DG REGIO

¹² tour_occ_anor2

The rest of the programme area, however, does not display clear divergences between countries or different parts of the programme area. This geographic homogeneity may hail from the fact that tourism is not overwhelmingly defined in any of these regions by large natural reserves or seasonal winter tourism, as is the case higher up in the north of Scandinavia. Instead, tourism flows are year-round, and well-established transport links by road, rail, air and ferry maintain active local tourism within and between the different regions. Many Scandinavian natives have seasonal homes along the coastlines and Swedish inland lakes, and there are a number of cities and towns with rich cultural heritage, attraction parks and events popular for shorter stays.

Similar observations emerge from looking at the European-wide map; The programme area is relatively homogeneous in performing relatively well on the synthetic indicator in European comparison, but slightly less than the values for some Nordic regions higher up north with large open natural reserves and long-established nature tourism sectors. That being said, it is of course very positive to see the good performance of the programme area on the synthetic indicator, especially given the mentioned characteristics of the area, with comparatively less NATURA 2000 sites, and its tourism sector, with mixed cultural and natural elements and destinations and thus comparatively less exclusive focus on wild natural heritage.

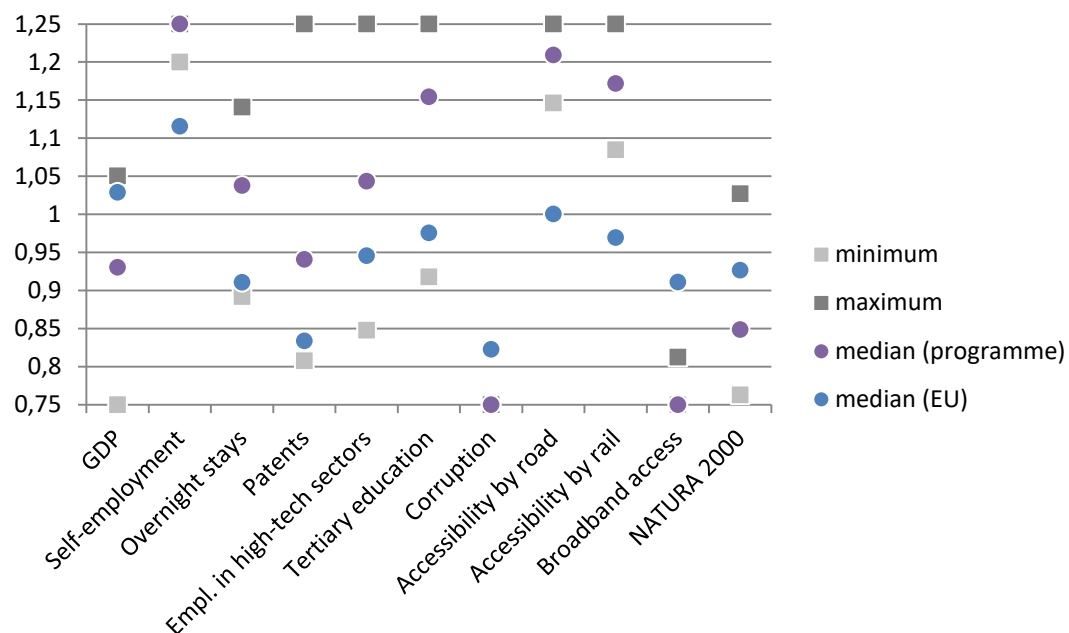
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions



4.4 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The ÖKS Programme Area performs relatively well in patent generation, self-employment, and perception of corruption. A relative low range of values across the programme regions is observed across all presented indicators, indicating a large degree of homogeneity across the programme area. In some cases, the Programme Area is performing worse than EU average, namely broadband access and size of NATURA 2000 sites.

Overall, the programme area scores median values well above EU median values on most indicators. It is, for example, interesting and positive to note that the number of overnight stays

scores highly despite the lack of a natural tourism sector of the same strength as that in the north of the Nordics. Other high-scoring indicators include road and rail accessibility; given the challenging geographical conditions (islands, sounds, and waterways that make land transport infrastructure more challenging), this is an impressive development, in fact, it might be that the background to the well-developed transport infrastructure is exactly because the geographical conditions have forced the regions to focus particular attention on this domain.

One indicator where the programme area scores a surprisingly modest measure in comparison with the EU median is the broadband access – especially given the advanced regional economies and innovation systems that make up the programme area.

What does, however, fit the overall picture of the programme area very well is the relatively homogenous values presented across the programme area for most indicators. There are of course divergences, but it seems that the overall trends of the different values mirror each other relatively well across the different regions, i.e. if the maxima value for one indicator is very high, then the minima value seems to usually be comparatively high as well in the context of the entire regional scoreboard table. This would seem to fit quite well the overall character of the programme area, where the societal, economic and environmental characteristics across the regions of the programme area are relatively homogenous.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: Development of knowledge and R&D centres	Strong regional research clusters and innovation systems	Decreased R&D spending	Potential for collaboration among shared focus-areas, such as maritime technologies and blue growth	Importance for long-term resilience of reaching critical mass in R&D activities
Criterion 2: Synergies between innovation stakeholders	Strong presence of universities and regional authorities in the economy	Decreasing R&D focus of SMEs in particular	Broad range of competitive sectors and skill-clusters in the programme area opens up for entirely new synergies	Relocation of large companies and research activities
Criterion 3: Pilot projects and testing	Extensive existing R&D facilities in the programme area	Uneven access to R&D facilities across the programme area	Considerable potential in sharing research infrastructure across the programme area	Threat of economic uncertainty leading to decreased public funding and private investment in new facilities

The programme area is characterised by significant R&D capacity, due to a skilled workforce and the presence of numerous universities and research facilities that are actively involved in the economy. The regions covered by the programme specialise in several skill-intensive industries, and due to the already extensive regional networks there is clear potential for synergies and innovations to grow out of collaboration both within and between sectors. That being said, many companies have decreased their R&D resources in recent years, which presents a risk to this regional innovative potential.

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: Renewable energy production and distribution	Well-working cross-border electricity distribution; access to renewable energy resources	Long distances	Potential to benefit from regional comparative advantages in renewable energy production	Deepening climate threats despite renewable energy efforts
Criterion 2: Energy efficiency in public infrastructure	Extensive existing regional climate strategies	Lack of common institutional framework across the programme area	Potential for economic and environmental benefits from build-up of circular economy	Threat of change in public sector priorities or funding base
Criterion 3: Environmentally friendly transport systems	High climate awareness and climate-friendly discourse in the programme area	Disparities in extent of low-carbon transport networks between regions in the programme area	Potential for business development in the transport sector	Increase in emissions from transport due to increased traffic flows

The programme area has a strong environmental focus in many of its core industries and in its energy mix, for example in the form of wind energy production. There are differences in these aspects between different regions, but on the other hand this also opens up the potential for the regions to collaborate with and support each other's efforts in sustainable growth. Such efforts become increasingly important as increased traffic flows puts pressure on the expansion of network infrastructures.

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: Coverage of traffic networks	Well-developed traffic networks North to South	Long distances; less extensive traffic networks in remote parts of programme area and in East-West direction	Cross-border potential in linking the programme area internally and externally (e.g. to Germany in the South) even more closely	Ageing and decreasing population in more peripheral region deepens need for well-designed and often expensive infrastructure investments in these areas
Criterion 2: Cross-border labour mobility	Existing tradition of cross-border cooperation; closeness in cultural heritage and language	Disparities in education and employment levels between urban and peripheral parts of the programme area	Potential for smooth and complementing cross-border labour markets, making critical mass easier to reach	Increase in young people without graduation diploma risks excluding them from the cross-regional labour market
Criterion 3: Investment support for microbusinesses	Healthy business environment in the region	Decrease in R&D spending among SMEs in the programme area	Potential from increasing the efforts of business incubators	Increasing rates of failed education degrees among potential young entrepreneurs

Like many regions in Europe, the regions included in the programme area are faced with increasing difficulties in their demographic structure as an ageing population gives rise to decreased labour supply and tax revenue. This challenge is particularly pronounced in the rural and more remote parts of the programme area, which are also oftentimes much less interconnected with surrounding regions due to more sparse infrastructure. An additional challenge for inclusive growth is presented by the disparities in education and skill-formation among young people. The programme area is, however, well placed to collaborate in overcoming these challenges, as there is a long tradition of cross-border networks. Cultural and language similarities significantly simplify such collaboration.

5.1.4 Main Challenge and Needs

Table 5.4: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	Strong universities and clusters	Decreased R&D spending	Specialisation and expertise in new fields, e.g. green and blue economy	Relocations and urban/rural disparities

	Strengths	Weaknesses	Opportunities	Threats
Sustainable growth	Existing green energy production in many regions	Long distances and disparities in green economy focus between different parts of programme area	Both environmental and economic benefits from circular economy and green economy specialisation	Increasing transport emissions, worsening climate situation
Inclusive growth	Strong cultural and language ties across borders, relatively high social equality	Disparities in infrastructure, education and employment levels between urban and peripheral parts of the programme area	Potential to expand cross-border connections, making it easier to reach critical mass and improve employment situation	Uneducated youth and peripheral areas risk exclusion from mobile labour market

The table above summarises the main strengths, weaknesses, opportunities and threats present in the programme area. A strong research capacity, focus on green energy and industry, and existing cross-border networks are all important contributors to the success, strength, and attractiveness of the region. There are some regional disparities which challenge this potential, and economic priorities of private actors may inhibit the development of green energy solutions and lead to decreased resources in funding available to R&D. Nevertheless, the programme area has considerable potential in maintaining and increasing its innovative and sustainable drive in an inclusive way through extensive inter-regional collaboration.

Strengths

The ÖKS programme area covers an attractive living environment with skill-intensive industries, strong focus on research and education, and active regional authorities committed to sustainable growth. Social equality and inclusion is predominantly at a high level across the programme area and the living standard is high. Societal discourse emphasises climate issues as a crucial challenge to future development, and thanks to this the priority of sustainable and resource-efficient development enjoys wide consensus among private and public actors as well as the education sector. Transport nodes and systems are particularly extensive in the North-South direction.

The ÖKS programme area has largely recovered from the European debt crisis and is currently experiencing high growth and robust employment. This growth has been sustained by low interest rates, domestic demand and successful cooperation across the Baltic Sea Region. (see Ketels, Pedersen and Olsson 2017).

Weaknesses

The main weaknesses of the programme area are the disparity in education levels, mobility opportunities, and network infrastructure between core areas and peripheries in the programme area. More remote regions and localities often also have more rapidly ageing population and a lack of opportunities for young people to stay. In transport, these areas often cover larger areas with longer distances and they may be dependent on less sustainable means of

transport. Over the past years there has also been some decrease in R&D spending in many developing sectors, not only in the peripheries but even in the growth centres.

Opportunities

The programme area is remarkably well placed to benefit from global competitive advantages in knowledge-intensive industries and sustainable growth. This potential is due to the strength of the existing education centres and specialisations in environmentally-friendly industries. There is extensive capacity in cross-border and inter-regional sharing of renewable-energy resources due to well-developed energy networks. Moreover, the regional labour markets and economies across the programme area have the capacity to become even more interlinked than they already are, due to similarity in languages and existing institutional frameworks. This has the potential to strengthen the economy and development of the programme area and make it easier to reach critical mass in innovation, education, and the development of a sustainable and circular economy.

Threats

The programme area, especially its more peripheral parts, suffers from an ageing population and consequently from the threat of increased pressure on the welfare state. This means that the required economic productivity levels and funding base for the many development opportunities of the ÖKS area may be endangered in the upcoming years. Without efforts to expand infrastructure networks, some parts of the programme area risk decline and depopulation as well as exclusion from development of new sectors and clusters. Moreover, the increasing number of young people who are failing to graduate from middle or high school constitutes a threat to inclusion into a mobile and productive future work force. Lastly, while economic productivity and trade volumes are still expected to increase, this puts increased pressure on the transport networks of the programme area and on their focus on environmental sustainability. This challenge is particularly pronounced in the several transport bottleneck nodes of the programme area. For example, waterways and marine transports are extensive in the programme area, thus this sector will require particular focus to combat these threats to smooth and sustainable infrastructure.

References

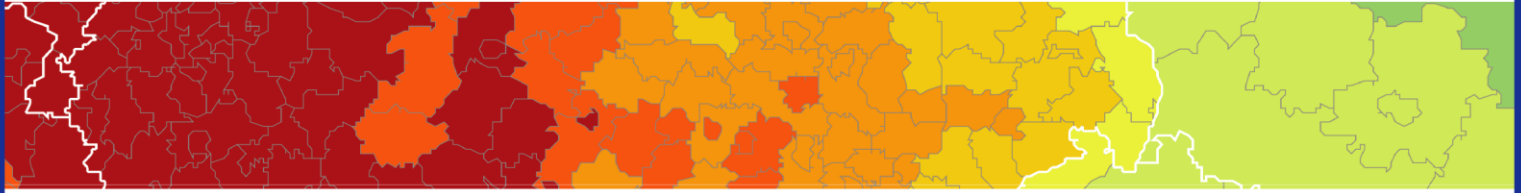
Böhme, Zillmer, Hans, Antikainen and Pyykkönen (2016): Looking towards 2030: Preparing the Baltic Sea Region for the future, European Strategy for the Baltic Sea Region (EUSBSR), Swedish Agency for Economic and Regional Growth: Stockholm.

Grunfelder et al. (2018): State of the Nordic Region. Nordregio.

Ketels, Pedersen and Olsson (2017): State of the Region Report 2017: The top of Europe – A competitive Baltic Sea Region ready for the Future?, Baltic Development Forum: Copenhagen.

Persson et al. (2011): SWOT-analysis för Kattegatt-Skagerrak. Oxford Research.

Rispling et al. (2016): Trends, challenges and potentials in the Baltic Sea Region, European Strategy for the Baltic Sea Region (EUSBSR) Swedish Agency for Economic and Regional Growth: Stockholm.



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

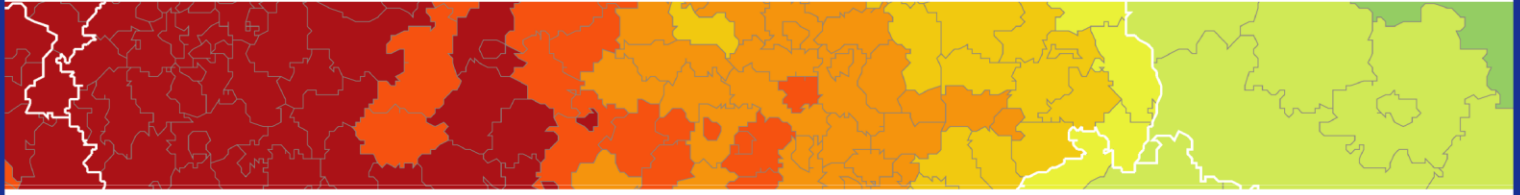
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG A South Baltic

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG A South Baltic

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview needs and challenges	3
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	4
3 Indicators	8
3.1 Initial result and output indicators used in assessment	8
3.2 Proposed Key Territorial Indicators.....	12
4 Benchmarking.....	16
4.1 Gross Value Added in Knowledge-Intensive Sectors	16
4.2 Innovation.....	19
4.3 Tourism and Sustainability.....	22
4.4 Regional Scoreboards.....	25
5 Reference Analysis	27
5.1 Territorial specificity of the programme area.....	27
5.1.1 Smart Growth	27
5.1.2 Sustainable Growth.....	27
5.1.3 Inclusive Growth	28
5.1.4 Main Challenge and Needs.....	28
References	31

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	8
Figure 4.1: Regional Scoreboard.....	25

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	15
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	15
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	18
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors	21
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	24

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.	12
Table 5.1: SWOT Analysis Smart Growth	27
Table 5.2: SWOT Analysis Sustainable Growth.....	27
Table 5.3: SWOT Analysis Inclusive Growth.....	28
Table 5.4: SWOT Analysis Overall Challenges and Needs	28

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

The South Baltic Programme (SWP) area includes the coastal region of five EU member states (Germany, Denmark, Sweden, Lithuania and Poland). The SBP has a non-metropolitan, mostly rural character, with population concentrated in a few large urban centres, which are the main poles of social and economic development. The area is inhabited by about 8.9 million people (2011) and the average population density is about 75 inhabitants per km², and therewith, far below the European average of about 117 per km². The SBP area is characterized by positive economic growth (higher than EU-28 average), based on knowledge-intensive services and research-intensive industries/SMEs that represent different blue and green sectors such as maritime sectors, tourism or forest economy. The programme area has experienced rapid and diverse demographic change characterized by an ageing society, low birth rates, negative net migration and brain drain caused by increasing levels of unemployment, particularly among younger people. The SBP areas has many natural assets and cultural heritage sites; as a result, tourism has increased rapidly, but it is seasonally and has put environmental pressures on coastal ecosystems. Large parts of the SBP Baltic area suffer from poor accessibility due to low population densities and distance to metropolitan areas, but the region leads the way in developing eco-friendly mobility solutions.

The SBP area includes the following administrative units at the NUTS III level:

- Germany – districts (Landkreise) of Mecklenburg-Vorpommern: Nordwestmecklenburg, Rostock, Vorpommern-Rügen, Vorpommern-Greifswald and district-free city (kreisfreie Stadt);
- Denmark – Regional Municipality of Bornholm and Region Zealand (subregions: Østsjælland, Vest- og Sydsjælland);
- Sweden – counties of: Kalmar, Blekinge, Skåne and Kronoberg;
- Lithuania – counties of Klaipėda, Tauragė and Telšiai;
- Poland – subregions of: Miasto Szczecin, Szczeciński, Stargardzki, Koszaliński, Słupski, Starogardzki, Gdański, Trójmiejski and Elbląski.

The total budget for the SWP area is €96,296,368.00, with the EU contributing €78,000,057.00, and the main funding instrument is the European Regional Development Fund (ERDF).

2.2 Contribution to EU 2020 strategy & situation in the programme area

The overall objective of the SWP is “to increase the blue and green growth potential of the South Baltic area through cross-border cooperation”. The SWP contributes to each of the following EU 2020 strategy pillars:

Smart Growth: The programme aims to increase the presence of blue and green sector SMEs in international markets and improve the transfer of innovations through cross-border actions. It also includes projects focusing on cross-border labour mobility.

Sustainable Growth: The programme promotes the areas natural and cultural assets to develop sustainable tourist destinations, and emphasizes environmental protection through the promotion of green technologies and environmentally friendly transport.

Inclusive Growth: The programme seeks to involve local community actors in cross-border cooperation networks and to train labour forces for blue and green sector occupations.

2.3 Overview needs and challenges

Economy: The South Baltic area is in general characterized by positive economic growth (higher than EU-28 average), but strong differences in economic growth and productivity exist across the regions. Knowledge-intensive services and research-intensive industries are growing. The South Baltic area is strongly based on SMEs, many of which represent different blue and green sectors such as maritime sectors, tourism or forest economy. Strong territorial differences in their innovation capacity, commercialisation of new products and export potential exist. Many SMEs in the South Baltic regions are challenged by a low level of international activity. There needs to be more coordinated infrastructure for exchange of cross-border innovation and internationalization of business activities.

Human resources: The programme area is characterised by diverse demographic structures. Age structures in the area vary strongly, and some regions are challenged by outmigration and/or low birth rates. Many regions are also experiencing increasing levels of long-term and youth unemployment, and have mostly experienced rising unemployment levels in the context of the financial and economic crisis since 2009. The South Baltic area has a well-developed educational infrastructure and low levels of early school leavers, but needs to offer better employment opportunities to prevent brain drain. There is a need to utilise the strong educational base in the SB to reduce brain drain and match education to employers needs

Environment and tourism: The South Baltic area includes a large number of natural and cultural heritage sites, which offer opportunities for tourism. Nonetheless, the concentration of economic activities in urban centres and coastal regions put pressure on the environment. Inflows of nutrients from the programme area damage the Baltic Sea water and threaten biodiversity. Populated areas suffer from inadequate air quality. Wind energy and wave energy offer development potentials for the South Baltic area, but require further technological developments. Closer cooperation and transfer of innovation may help to boost this sector. Tourism to the South Baltic areas has increased during recent years, but changes strongly by season and is concentrated along the coastal areas, putting particular pressure on ecosystems there. Sustainable development solutions are required to balance economic and environmental interests. there is a need protect the environment through the development of ecosystem services tools and environmentally friendly technologies such as renewable energies.

Transport: Large parts of the South Baltic area suffer from poor accessibility due to low population densities and distance to metropolitan areas. After EU accession, transport infrastruc-

ture was built up in Lithuania and Poland, co-financed by EU Cohesion and Structural funds, but differences in infrastructure remain. Regions in Sweden and Denmark have introduced sustainable and eco-friendly mobility solutions, but other regions are lagging behind. Strong differences between the regions exist also with respect to the ratio of rail- to road haulage. The Baltic Sea remains a barrier between the territories in the programme area. Joint action could improve the connectivity of the region and promote sustainable mobility solutions. There is a need to increase connectivity by creating joint approaches to the development of sustainable mobility and environmentally friendly forms of transport.

Institutional Capacities: A common South Baltic identity does not exist in local and regional communities and the number of actors involved in cross-border activities is limited. There is a need to facilitate partnerships and strengthen cross-border cooperation between institutions and stakeholders to ensure funding instruments and programmes are used effectively.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1.1: Increase the presence of blue and green sector SMEs from the South Baltic area in international markets through joint cross-border actions

Priority Axis 1: Strengthening International activeness and innovation capacity of the South West Baltic blue and green economy (TO3, IP 3b)

- *Brief justification:* low internationalization capacity of SMEs in the region and insufficient advisory services and matchmaking actions to help SMEs reach international markets.
- *Main change sought:* enhance the competitiveness of SMEs by increasing innovation transfer and the presence of blue and green growth SMEs in international markets through joint cross-border actions.
- *Expected activities:* develop joint business models for internationalization of SMEs; market research for SMEs, organize activities to promote products and services; awareness raising campaigns for international trade.
- *Beneficiaries:* SME cluster organization, chamber of commerce, business agencies and innovation centres, local and regional authorities, higher education institutes and NGOs, European groupings of territorial cooperation

Specific objective 1.2: Improve the transfer of innovation for the benefit of blue and green sector SMEs through joint cross-border initiatives

Priority Axis 1: Strengthening International activeness and innovation capacity of the South West Baltic blue and green economy (TO1, IP 3d)

- *Brief justification:* Varying innovation capacity between SMEs in the region and potential for innovation transfer through cross-border networking and clustering.
- *Main change sought:* Increase innovation capacity of blue and green growth SMEs and transfer innovation to less advanced regions.
- *Expected activities:* cross-border training facilities for SMEs, business advisory services, cross-border events to exchange information, develop cross-border smart specialization strategies; develop cross-border triple-helix cooperation platforms.

- *Beneficiaries:* SME cluster organization, chamber of commerce, business agencies and innovation centres, local and regional authorities, higher education institutes and NGOs, European groupings of territorial cooperation

Specific objective 2.1: Increased development of the South Baltic area's natural and cultural heritage assets into sustainable tourist destinations.

Priority Axis 2: Exploiting the environmental and cultural potential of the South Baltic area for the blue and green growth (TO 6, IP 6c)

- *Brief justification:* unbalanced seasonal pattern and tourism. High quality of natural and cultural heritage sites create potential for active holiday and leisure activities.
- *Main change sought:* increase popularity of natural and cultural heritage sites as sustainable tourism destinations.
- *Expected activities:* small pilot investments for tourism infrastructure and services, joint events for promoting region, joint marketing of region, capacity building actions for managing cultural heritage sites, joint ICT tools for cross-border tourism, exchange knowledge on eco-management, protect biodiversity.
- *Beneficiaries:* SME cluster organization, chamber of commerce, business agencies and innovation centres, local and regional authorities, higher education institutes and NGOs, European groupings of territorial cooperation, forest management and cultural heritage institutions.

Specific objective 2.2: Increased use of green technologies in order to decrease the pollution discharges in the South Baltic area.

Priority Axis 2: Exploiting the environmental and cultural potential of the South Baltic area for the blue and green growth (TO 6, IP 6f)

- *Brief justification:* environmental pressures resulting from concentration of pollution and economic activities in Baltic Sea leading to high eutrophication and noxious air quality. High potential to develop green technology sectors in the region.
- *Main change sought:* increase the use of green technologies in the South Baltic
- *Expected activities:* small scale green technology investments in renewable energies, cross-border sustainable energy networks, cross-border studies to mitigate water and air pollution, common testing standards for air and water, testing to help decrease outflows of nutrients.
- *Beneficiaries:* SME cluster organization, chamber of commerce, business agencies and innovation centres, local and regional authorities, higher education institutes and NGOs, European groupings of territorial cooperation, cooperatives of farmers and residents, public and private companies working with environment.

Specific objective 3: Improve the quality and environmental sustainability of transport services in the South Baltic area.

Priority Axis 3: Improving cross-border connectivity for a functional blue and green transport area (TO 7, IP 7c)

- *Brief justification:* predominant car-based mobility pattern and unsatisfactory connectivity due to weak transport infrastructure. Significant disparities between Eastern and Western parts of the region in environmentally friendly transport.
- *Main change sought:* improved and more environmentally friendly and sustainable passenger and cargo services.

- *Expected activities:* deployment of cross-border transport greening measures, development of joint smart mobility concepts, more environmentally friendly transport, joint studies on intermodal passenger and cargo services, improve, sustainability of air and sea transport services.
- *Beneficiaries:* local and regional authorities, public transport companies, transport infrastructure administration, SMEs, chamber of commerce, business agencies and higher education institutes, European groupings of territorial cooperation.

Specific objective 4: Increase the share of skilled labour force working in blue and green economy sectors of the South Baltic area through joint cross-border actions

Priority Axis 4: Boosting human resource capacities for the area's blue and green economy (TO 8e, IP 10a)

- *Brief justification:* mismatch of education and needs of employers. High unemployment rates and difficulties to attract qualified labour
- *Main change sought:* better prepared labour force for work places in blue and green sector companies
- *Expected activities:* develop cross-border services connecting vocational and tertiary education graduates with employers, cross-border training programmes for the labour force, harmonization of international education qualifications, cross-border internships and apprenticeships, models to promote self-employment, information services for cross-border workers on legal requirements.
- *Beneficiaries:* local and regional authorities, labour offices and administration, higher education institutes, associations and clusters of SMEs, NGOs in labour market training, European groupings of territorial cooperation.

Specific objective 5: Improve the cooperation capacity of local South Baltic area actors through participation in cross-border networks

Priority Axis 5: Increasing cooperation capacity of local actors in the South Baltic area for the blue and green growth (TO 11, IP 11b)

- *Brief justification:* limited participation of actors in network of partners, organizations and institutions in the region. A low recognition of shared regional identity in local communities and need to increase capacity for cross-border cooperation between local actors.
- *Main change sought:* improve cooperation of local actors in cross-border cooperation networks
- *Expected activities:* cross-border knowledge exchange regarding cooperation between citizens and institutions on local challenges, joint activities between local government administrations, awareness raising campaigns between local actor groups to promote shared culture and identify, joint initiatives aimed at strengthening networks, increase involvement of local actors in project development.
- *Beneficiaries:* local and regional authorities, NGOs involved in cross-border networking, chamber of commerce, institutions of cultural and national heritage, European groupings of territorial cooperation.

Synergies with other EU interventions: Priority Axis 1 of the SBP corresponds with Horizon 2020, which promotes smart specialisation, intends to create innovation-friendly business environment for SMEs, and links emerging centres of excellence and innovative regions in less developed Member States to leading counterparts elsewhere in Europe. Apart from that, Priority axis 1 has some commonalities with COSME (Programme for the Competitiveness of

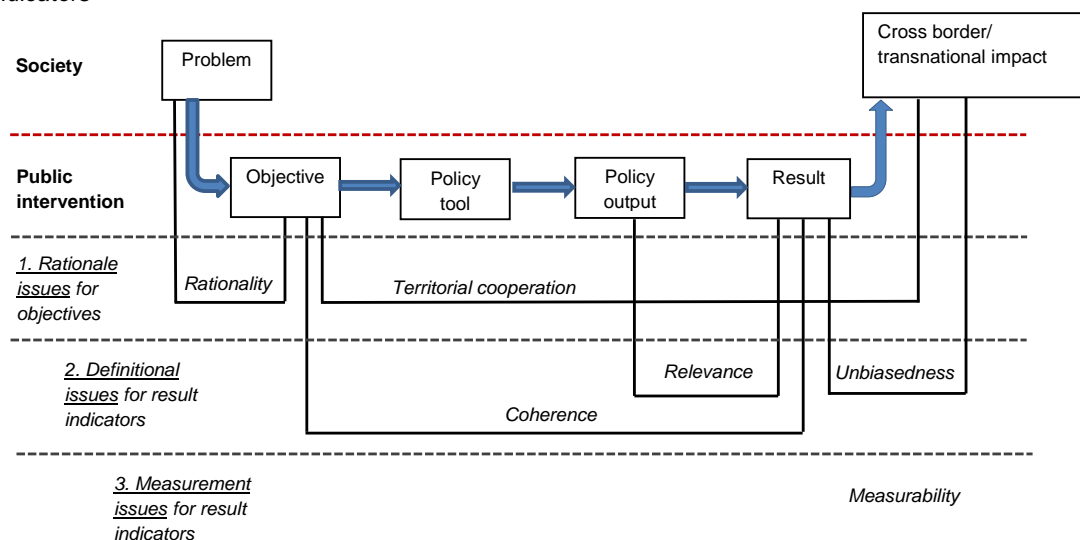
Enterprises and Small and Medium-size Enterprises), which enables SMEs to have access to markets by offering assistance to find a business partner abroad: in the EU or worldwide. Priority Axis 2 of the SBP liaises with LIFE (European Programme for Environment and the Climate Action), which supports integrated projects in the areas of nature, water, waste, air, climate change mitigation and climate change adaptation. Priority axis 4 of the SBP complements the Connecting Europe Facility (CEF) by addressing regional connectivity issues and opportunities created by the TEN-T core and comprehensive networks for urban and rural areas. Priority 4 and 5, the SBP is linked to the programme for Social Change and Innovation (PSCI), notably in the field of social innovation and social policy experimentation. Specifically, in priority 4, the SBP provides a cross-border perspective to the Youth Employment Initiative, which will help young people currently not in employment in EN 115 EN some South Baltic regions experiencing youth unemployment rates above 25%. Priority 4 also liaises with the EURES (the European network of Employment Services), “Creative Europe” initiative (for the cultural and creative sectors) and “Erasmus +” (aimed to boost skills and employability, as well as modernising education, training, and youth work). Priority 5, in turn, corresponds to the “Europe for Citizens” Programme, which aims to improve conditions for civic and democratic participation at an EU level.

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
3	Increase the presence of blue and green sector SMEs from the South Baltic area on international markets through joint cross-border actions	Performance in the South Baltic area with regard to the presence of blue and green sector SMEs in international markets (performance level (in %) in relation to the maximum performance)	HIGH	HIGH	HIGH	MEDIUM - The definition of the result indicator is not very clear	LOW - The internationalisation of SMEs is influenced by several other factors (sectoral and functional specialization, etc.)	LOW - What is meant by "performance"? Probably not available/ difficult to collect
3	Improve the transfer of innovation for the benefit of blue and green sector SMEs through joint cross-border actions	Performance in the South Baltic area in the transfer of innovation for the benefit of blue and green sector SMEs (performance level (in %) in relation to the maximum performance)	HIGH	HIGH	HIGH	MEDIUM - The definition of the result indicator is not clear	LOW - Innovation transfer is influenced by several other factors (sectoral proximity, budget for R&D activities etc.)	LOW - What is meant by "performance"?
6	Increased development of the South Baltic area's natural and cultural heritage assets into sustainable tourist destinations	Performance in the South Baltic area in the use of natural and cultural heritage assets as sustainable tourist destinations (performance level (in %) in relation to the maximum performance)	HIGH	LOW - It is not fully clear how territorial cooperation will help achieving this result	HIGH	MEDIUM - The definition of the result indicator is not clear	LOW - Tourism is influenced by several other factors (cultural and natural assets, physical accessibility, etc.)	LOW - What is meant by "performance"?
6	Increased use of green technologies in order to decrease the pollution discharges in the South Baltic area	Performance in the South Baltic area in the uptake of green technologies in order to decrease the pollution discharges (performance level (in %) in relation to the maximum performance)	HIGH	LOW - It is not fully clear how territorial cooperation will help achieving this result	HIGH	MEDIUM - The definition of the result indicator is not clear	LOW - The use of green technologies is influenced by several other factors (oil price, availability of alternative sources of energy, etc.)	LOW - What is meant by "performance"?
7	Improve the quality and environmental sustainability of transport services in the South Baltic area	Performance in the South Baltic area in the provision of transport services of high quality and environmental sustainability (performance level (in %) in relation to the maximum performance)	HIGH	HIGH	HIGH	MEDIUM - The definition of the result indicator is not clear	LOW - How is "high quality" defined? The choice of alternative transport modes is influenced by other factors (gasoline price, etc.)	LOW - What is meant by "performance"?
8	Increase the share of skilled labour force working in blue and green economy sectors of the South Baltic area through joint cross-border actions	Performance in the South Baltic area to ensure skilled labour for the blue and green economy (performance level (in %) in relation to the maximum performance)	HIGH	HIGH	LOW - The objective is the increased in skilled workforce employed and it is not mirrored by the result indicator	LOW - The definition of the result indicator is not clear	LOW - What is measured by the result indicator?	LOW - What is meant by "performance"?
11	Improve the cooperation capacity of local South Baltic area actors through participation in cross-border networks	Performance in the South Baltic area to engage local actors in cross-border activities (performance level (in %) in relation to the maximum performance)	HIGH	HIGH	LOW - The objective is the participation of actors in networks, and it is not mirrored by the result indicator	MEDIUM - The definition of the result indicator is not clear	LOW - What is measured by the result indicator?	LOW - What is meant by "performance"?

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

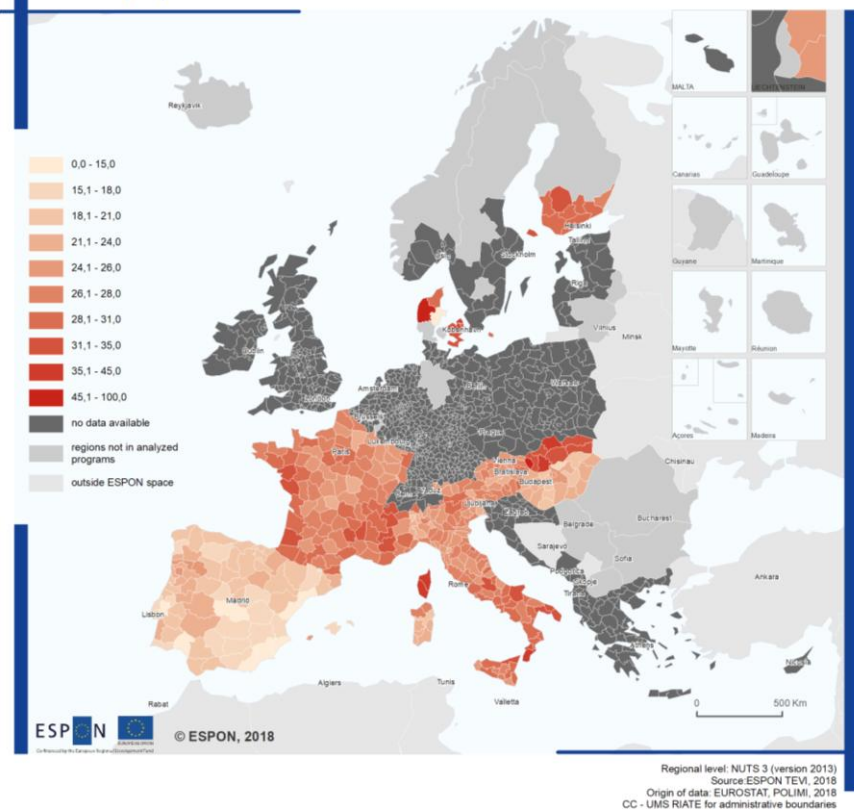
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Thematic objective	Specific objective	Output indicator	Result indicator	Proposed result indicator
3	Increase the presence of blue and green sector SMEs from the South Baltic area on international markets through joint cross-border actions	O1: No. of cross-border support services/ programmes delivered to blue and green sector SMEs to foster their internationalisation (Absolute numbers) O2: No. of cross-border support services/ programmes delivered to blue and green sector SMEs to foster their competitiveness (Absolute numbers) CO1: Productive investment: Number of enterprises receiving support (Enterprises) CO2: Productive investment: Number of enterprises receiving grants (Enterprises) CO3: Productive investment: Number of enterprises receiving non-financial support (Enterprises)	Performance in the South Baltic area with regard to the presence of blue and green sector SMEs in international markets (performance level (in %) in relation to the maximum performance)	Patent applications in the relevant sector (to be controlled for other influential factors through DID)
6	Increased development of the South Baltic area's natural and cultural heritage assets into sustainable tourist destinations	O1: Size of pilot investments co-financed by the Programme in blue and green tourism infrastructure and services (EUR) O2: No. of delivered blue and green tourism services, products and too (Absolute numbers) O3: No. of delivered blue and green services, products and tools exploiting the environmental, natural and cultural potential of the South Baltic area (Absolute numbers) CO1: Sustainable Tourism: Increase in expected number of visits to supported sites of cultural and natural heritage and attractions (Visits/ year)	Performance in the South Baltic area in the use of natural and cultural heritage assets as sustainable tourist destinations (performance level (in %) in relation to the maximum performance)	Synthetic indicator: tourism presences + seasonality
6	Increased use of green technologies in order to decrease the pollution discharges in the South Baltic area	O1: Size of pilot investments co-financed by the Programme in the uptake of green technologies (EUR) O2: No. of delivered green technology services, products, standards and tools (Absolute numbers) O3: No. of delivered blue and green services, products and tools exploiting the environmental, natural and cultural potential of the South Baltic area (Absolute numbers)	Performance in the South Baltic area in the uptake of green technologies in order to decrease the pollution discharges (performance level (in %) in relation to the maximum performance)	Share of energy consumption from environment-friendly energy sources (to be controlled for other influential factors through DID)
7	Improve the quality and environmental sustainability of transport services in the South Baltic area	O1: Size of pilot investments in transport services cofinanced by the Programme (EUR) O2: No. of delivered strategies, measures and tools aimed at improving the standard, efficiency, interoperability and/ or environmental performance of transport services (Absolute numbers)	Performance in the South Baltic area in the provision of transport services of high quality and environmental sustainability (performance level (in %) in relation to the maximum performance)	Synthetic indicator: number of cross-border commuters + share of travellers commuting by car
8	Increase the share of skilled labour force working in blue and green economy sectors of the South Baltic area through joint cross-border actions	O1: No. of delivered cross-border employment schemes (i.e. services, model solutions, tools and programmes) and joint training supporting employment in the blue and green economy of the South Baltic area (Absolute numbers) O2: No. of stakeholders involved in the implementation of cross-border employment schemes and joint training (Absolute numbers) CO1: Labour Market and Training: Number of participants in joint local employment initiatives and joint training (Persons) CO2: Labour Market and Training: Number of participants in joint education and training schemes to support youth employment, educational opportunities and higher and vocational education across borders (Persons)	Performance in the South Baltic area to ensure skilled labour for the blue and green economy (performance level (in %) in relation to the maximum performance)	Professionals, managers, etc. employed in the regional economy (to be controlled for other influential factors through DID)
11	Improve the cooperation capacity of local South Baltic area actors through participation in cross-border networks	O1: No. of local actors involved in cross-border activities (Absolute numbers) O2: No. of joint capacity-building activities/ events involving local actors (Absolute numbers)	Performance in the South Baltic area to engage local actors in cross-border activities (performance level (in %) in relation to the maximum performance)	Analysis of the regional cooperation networks and assessment of the centrality of the public institutions

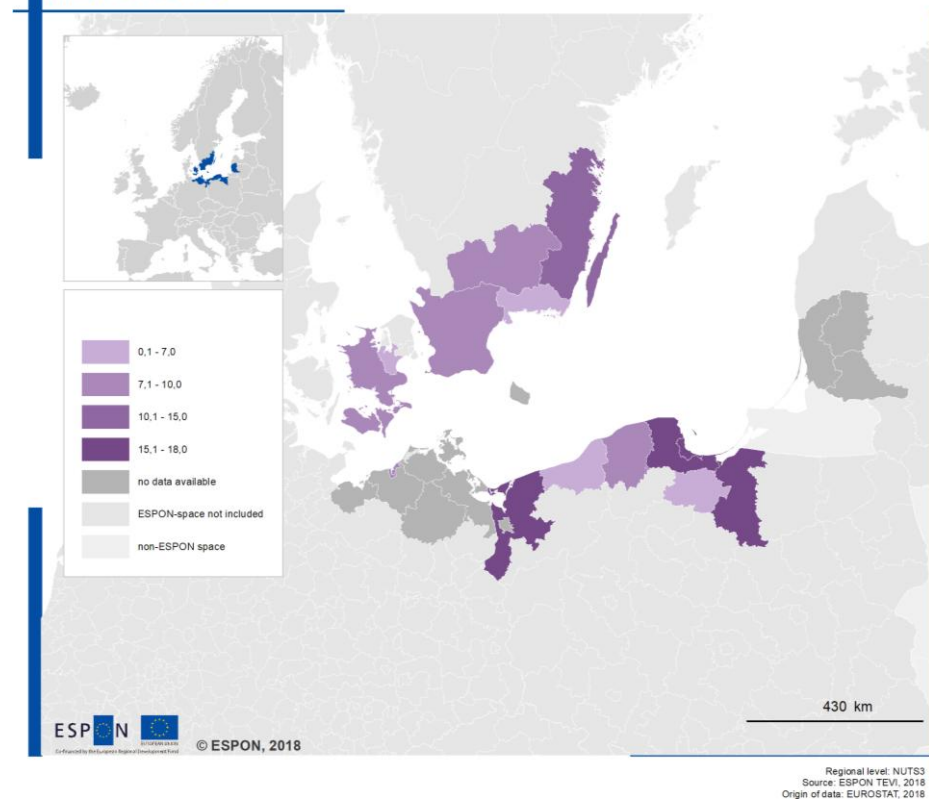
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)

Composite Indicator: patent applications + trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined timeperiod. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. A minimum of 1.7 can be observed, with corresponding maximum of 200. Low performing regions include the German and Polish Baltic Sea coast. Maxima are found primarily in urban centres, most prominently in Malmö. It is notable that while some of the urban agglomerations in the programme area are known for cutting-edge technological clusters in a range of fields, they do not seem to stand out very prominently in the European comparative map. The reasons for this are manifold, but can conceivably be linked to the characteristics of these sectors in the regional economy, where relatively rigid labour market

⁶nama_10r_3gva

⁷nama_10r_3empers

traditions and a labour migration enhanced pattern of intra- and inter-regional disparities may risk crowding out the positive effects from innovative start-ups.

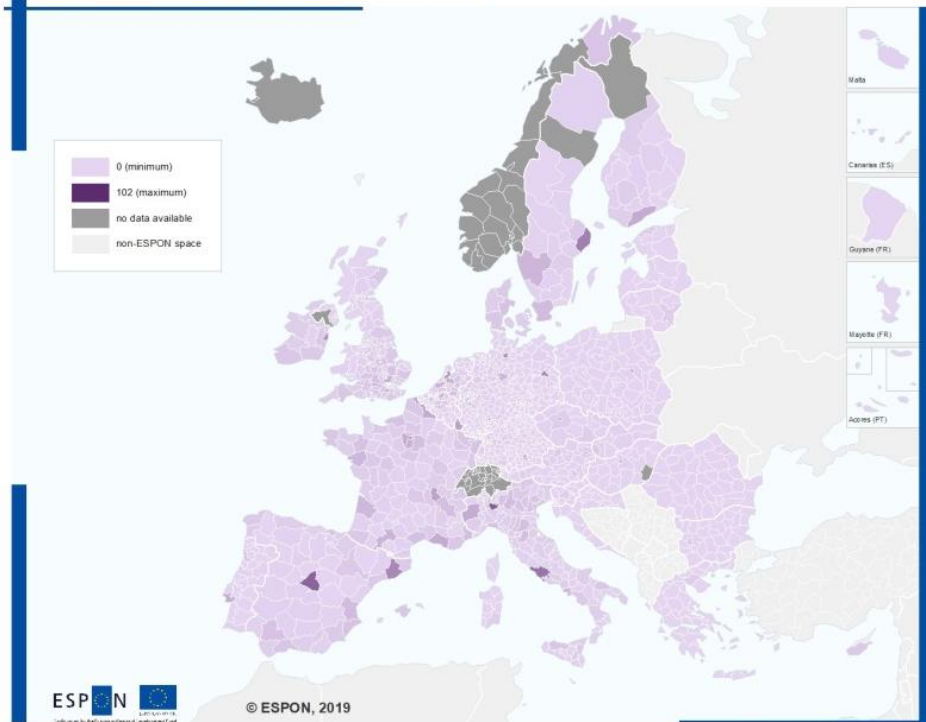
The programme area comprises some of the most high-powered regional knowledge economies in Europe. The Malmö-Copenhagen area in Sweden and Denmark as well as Hamburg in Germany host high-quality institutions of higher education and research, which have supported the emergence of both private and public endeavours in knowledge intensive sectors. Vilnius in Lithuania is similarly beginning to develop more mature innovation centres, particularly with the benefit of European funding. These agglomerations of knowledge-intensive economic activity are clearly visible in the map visualisation (4.1) of the synthetic indicator; the above-mentioned areas score the highest among the regions in the programme area and slightly above average in the European-level comparative map.

It is also worth highlighting that all Danish regions that are part of the programme area comparison score highly – this is not surprising when considering the long-standing reliance and focus of the Danish economy on start-ups and an agile labour market. It is therefore easy to conceive that the Danish regions could score well on this indicator, which due to its synthetic nature lifts up such regions where the focus on knowledge intensive industries is truly cross-cutting.

To address the relatively consistent scores also among rural areas, it is worth noting the efforts undertaken in many regions to spin off businesses from old industries within the bio-economy, circular economy and green infrastructure. In other words, previously declining sectors are turned into markets of opportunity. That being said, it is still important to recognise that progress in many of these areas has not been ideal, as shown by the stark contrast in scoring between, for example, the high-performing levels of Skåne in Sweden vis-à-vis the lowest-scoring regions – trends of out-migration and youth unemployment have slowed down progress. In many parts of the programme area the start-up culture is also much less dynamic and more risk-averse than the one described above for Denmark, especially in regions where the most lucrative sectors are predominantly in more incremental and resource-intensive fields of knowledge-intensive innovation: In these latter regions, progress may be very reliant on the success and activities of the leading private actors in that sector, leaving regional entrepreneurship vulnerable to shocks and relocation of research facilities.

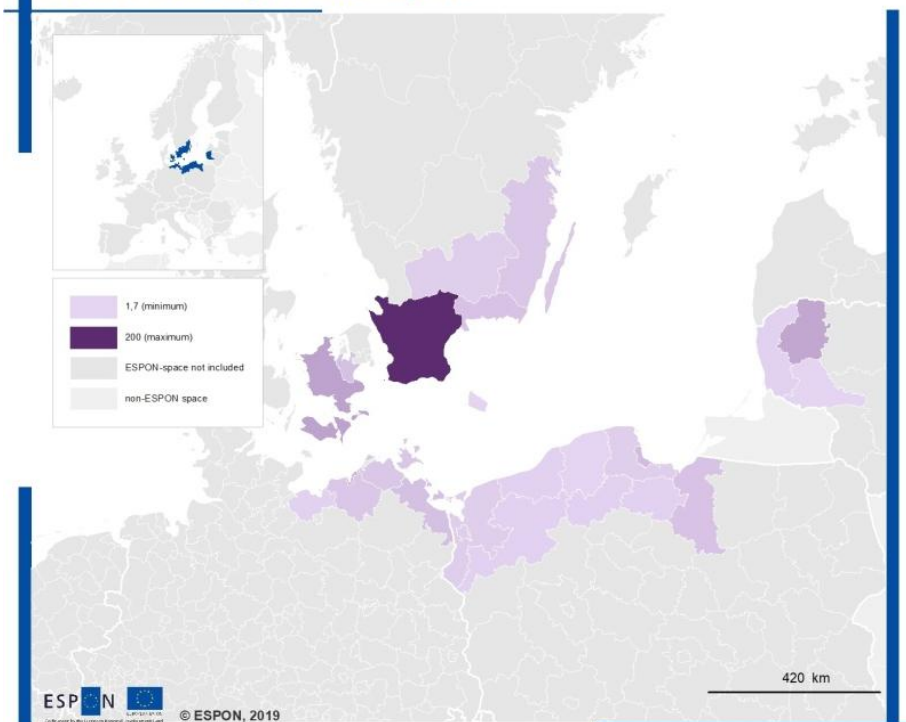
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PolMI, OIR
 © UMS RIATE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PolMI, OIR

4.2 Innovation

The maps below present the synthetic composite indicator *Innovation* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Innovation in the framework of the indicator is restricted to technical innovation via patent and trademark registration, thus not necessarily reflecting the status of social innovations. The composite indicator quantifies the innovation outputs undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework innovative economic activities. The indicator is calculated in the following manner:

$$Innovation = \frac{1}{2} * P_{i,t} + \frac{1}{2} * T_{i,t}$$

In which the variable $P_{i,t}$ represents normalised patent application values per NUTS-3 region to the European Patent Office in region i and at time t . Analogously, $T_{i,t}$ represents normalised trademark applications in a given region i and at time t . Thus, the indicator captures scientific and technical innovation, in addition to capturing process innovation via new products and similar by companies. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Trademark values on NUTS-3 level are obtained via the indicator European Union trade mark (EUTM) applications by NUTS 3 regions⁹.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of one can be observed in Northern Flemish regions, with corresponding maximum of 109.6. Maxima are found in Southern Sweden, in Blekinge and Skane län.

The programme area demonstrates significant variation on the innovation-focused synthetic indicator. The concentration in Southern Sweden can be attributed in large part to the main industry clusters in pharmaceutical research as well as the large local presence of leading

⁸ tgs00041

⁹ ipr_ta_reg

corporations in the interior design, construction, and transport industries. As discussed in connection to the previous synthetic indicator, the emergence of these strong figures is rooted in close and continuous collaboration among businesses and universities with the support of regional and other authorities, and this development of a knowledge-intensive innovation system has been long in the making.

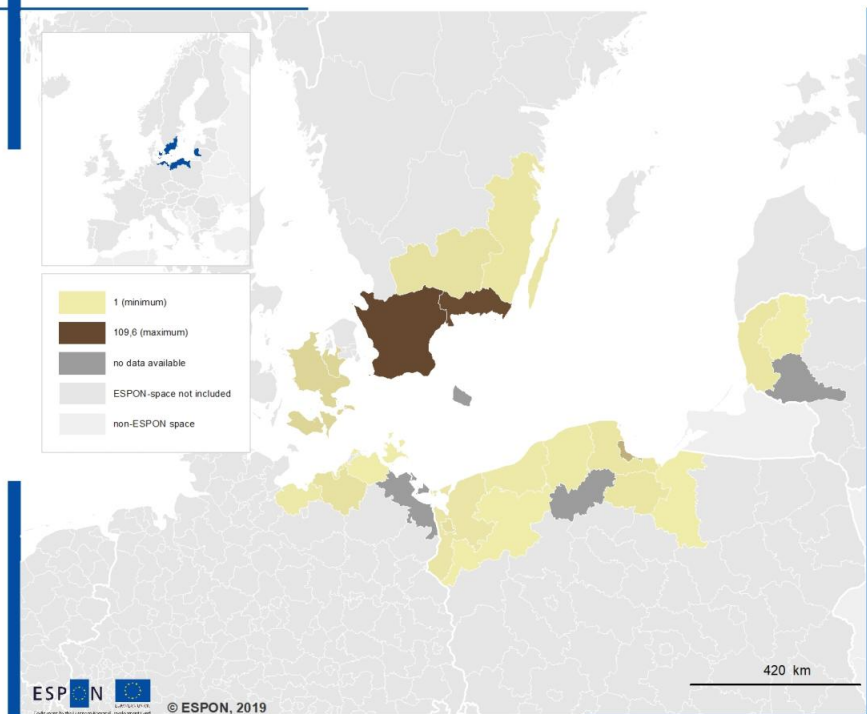
Values for the other regions can be read through a similar lens; regions that do well in terms of the number of patents and trademarks tend to be those which host one or several world-leading knowledge-intensive industries and which have consolidated the innovation system with support from public sources and academia. Lithuania, for example, has in the recent years developed some strong innovation centres that are benefitting from EU funding.

Viewing the wider European context of the synthetic indicator, the nearby Stockholm region stands out in the ESPON area as one of the EU's most innovative regions, where both established industries and start-ups are constantly developing and expanding their intellectual property. These innovative clusters are supported by Stockholm's strong university base, with Karolinska, KTH and the Stockholm School of Economics collaborating on research and training in their respective fields.

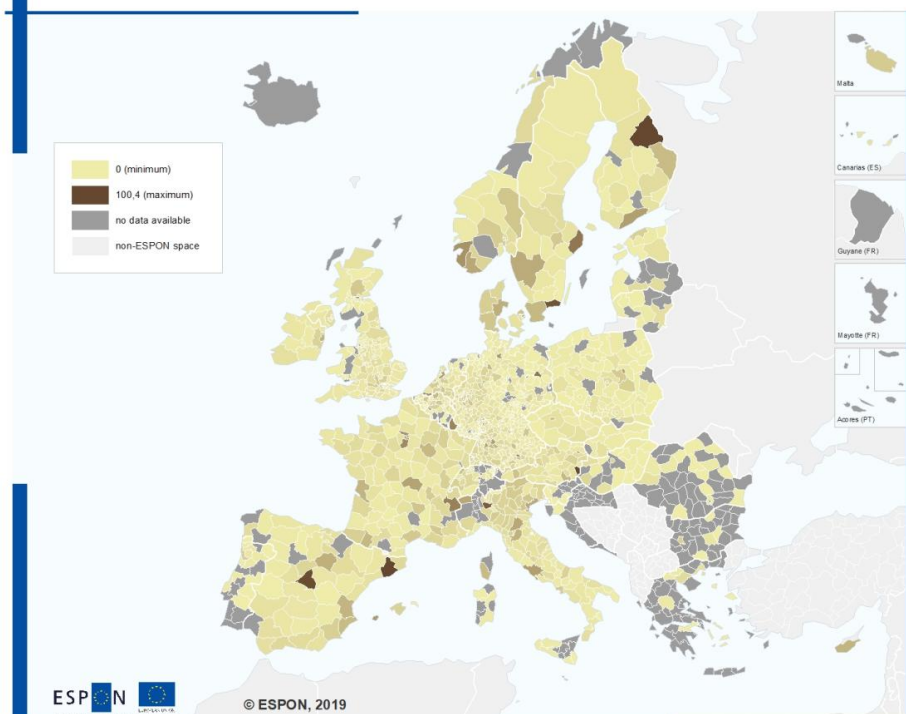
A noteworthy feature with the systemic indicator is that as the measurement is based on patents and trademarks, some sectors and industries can be expected to systematically do better in the quantitative comparison than others. As already noted above, social innovation is excluded from the analysis. In addition, however, there is a great deal of technological innovation that will not be captured by the measurement, either, as not nearly all R&D&I activities involve patent or trademark applications. One factor behind this is the degree of radical vis-à-vis incremental innovation; those sectors in which companies tend to predominantly aim to develop fundamentally new components or products can be expected to be much more active than those industry-sectors in which innovation tends to be centred on gradually improving existing technologies. Another cause of variation in patent application volumes simply hails from tendencies that evolve over time within each respective company or cluster – even among actors within the same sector there may be large differences depending on how patenting and research activities have been structured. The above variables may help explain why some regions in the European-level map score very highly while some clusters with similarly intensive research activities do not reach the same measurement on the synthetic indicator.

Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies the development in tourism and sustainability undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations and inverted. The indicator stems from Eurostat and is available in monthly intervals at national level¹⁰. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹¹ is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹². This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of zero can be observed with corresponding maximum of 179.5. Minima are found along the Polish Baltic Sea coast and Estonia. Maxima are found along the German Baltic Sea Coast and in the Danish Region of Hovedstaden.

Generally, Denmark, Germany and Sweden are showing stronger levels of tourism than Poland and Lithuania both in the programme area and ESPON space as a whole. There are well-established travel links between the Scandinavian countries and northern Germany both

¹⁰ tour_occ_nim

¹¹ Source: EEA, DG REGIO

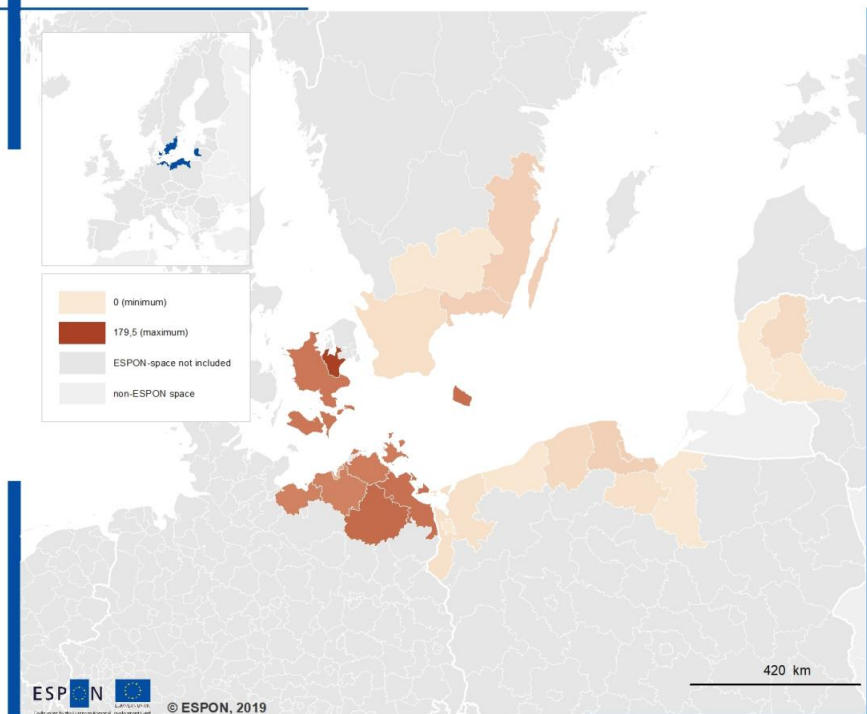
¹² tour_occ_anor2

by train, plane and ferry, and societal traditions keep Copenhagen, Hamburg and other cities popular destinations for short weekend visits among the people living in the programme area. Copenhagen is also an important European aviation hub, which increases the access of travellers to the surrounding region. Travel links with Lithuania, in contrast, are relatively expensive, which reduces the number of visitor stays. In Poland, Gdansk and Szczecin are becoming increasingly more popular destinations and should see a rise in popularity over the coming years. Nature tourism is also on the rise in the rural destinations in Northern Germany, Denmark and Sweden, with both summer and winter activities gaining popularity, the latter in particular in the case of Sweden. The island of Gotland of Sweden's South-eastern coast is also a very popular destination, with the political dialogue event Almedalen held there each summer.

The European comparative map displays similar heterogeneity on the synthetic indicator as the contrasts within the programme area. The Nordic countries score highly, and it is notable that Finnish Lapland seems to meet the different elements measured by the indicator particularly well, combining nature tourism with protection of large natural reserves.

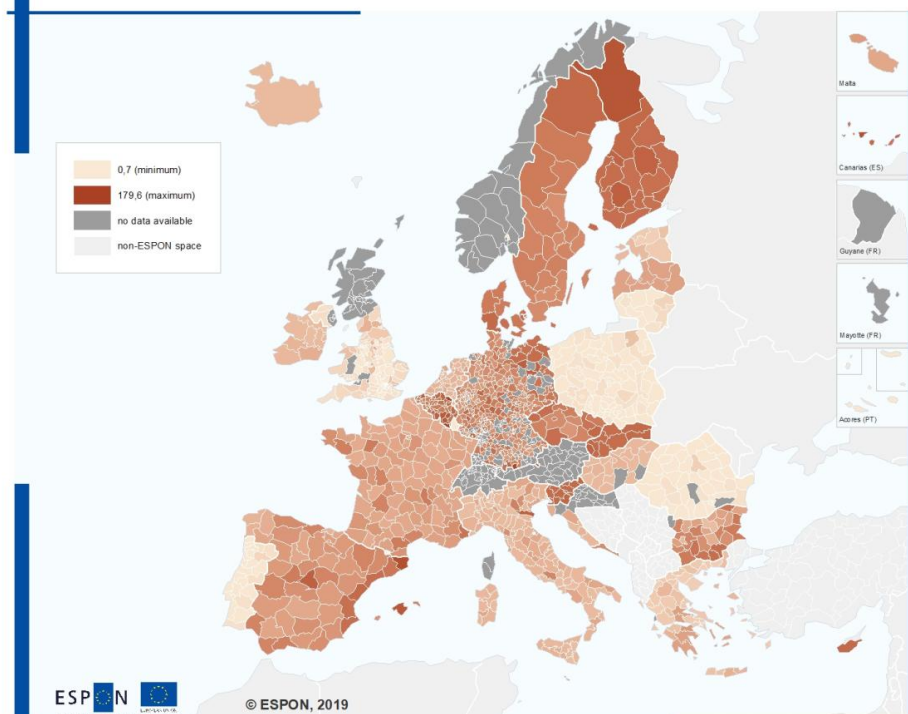
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PolMI, OIR

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions

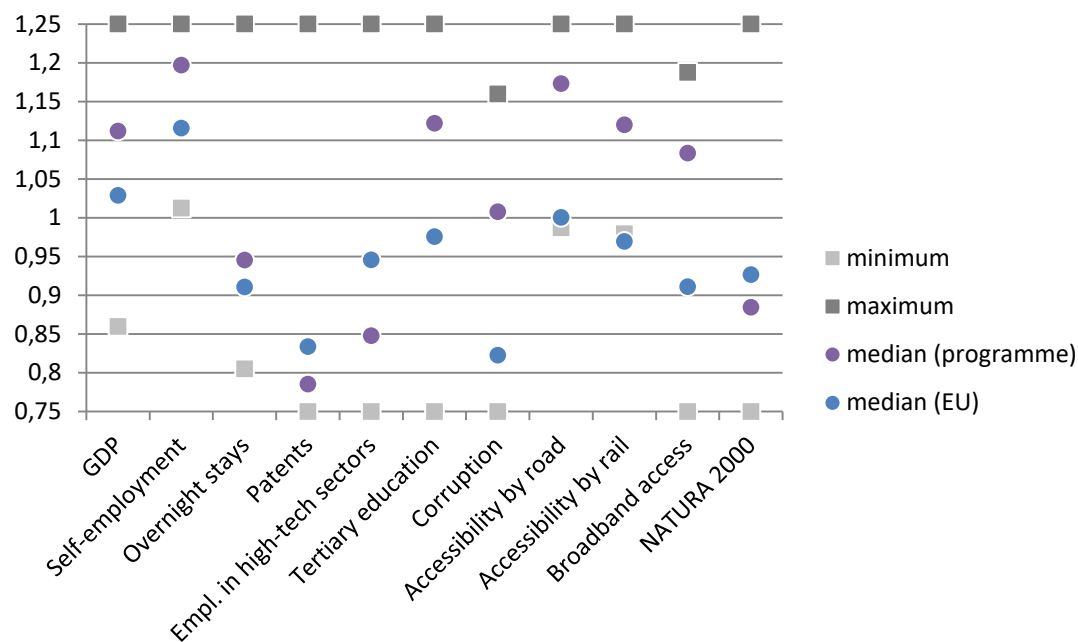


Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PolMI, OIR
 © UMS RIATE for administrative boundaries

4.4 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The South Baltic Programme Area performs relatively well in terms of economic performance, share of population with tertiary education, and accessibility. A relative large range of values across the programme regions is observed across all presented indicators, indicating a certain degree of heterogeneity across the programme area, especially in the case of patent generation, overnight stays and NATURA 2000 sites. In some cases, the Programme Area is performing worse than EU average, namely in share of persons with employment in high-tech sectors and a perceived higher level of corruption.

The notable heterogeneity in terms of patents hails, as noted above, from the fact that a region requires sufficient critical mass of knowledge intensive institutions and industries in order to score highly, and even with these conditions filled there is variation that is dependent on industry sector and institutional tradition. The programme area thereby has both regions that score very highly and regions where R&D&I is either less prevalent in the predominant fields of the local economy or focussed in a way that is not captured well by the measurement of the correlating indicators. For similar reasons the median value in the share of employment in high-technological sectors is lower than that of the EU median; large parts of the programme area are rural with an unbalanced economy in terms of high-technological industry. That being said, the strong capacity for knowledge-intensive activities and innovation in the programme area can be discerned from the values in self-employment and tertiary education levels. While the latter also shows heterogeneity in values, the median for each of these two indicators scores markedly higher than the EU median.

The heterogeneity in tourism and environmental protection can be seen to directly mirror the heterogeneity in the programme area where some regions are rural and focused on natural tourism whereas others are strongest in cultural heritage assets. Moreover, the programme area does very well in terms of transport links and broadband access, both of which are promising characteristics for an area with increasing research-focus in a competitive European market.

Lastly, it is worth highlighting the markedly higher median score on perceived corruption within the programme than within the EU as a whole. While it is difficult to seek explanations for these differences, it is notable that the indicator measures people's perceptions which, on the one hand, makes for a valid indicator, but on the other hand, which also makes cross-regional comparison difficult as respondents have answered survey questions from their respective contexts and subjective perceptions.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: Competitiveness of SMEs	High levels of innovation in the region	Low investment growth and weak internal business learning capacities in SMEs	Green and blue growth SMEs with potential for high added value	Brain drain and ageing society
Criterion 2: Activeness of SMEs internationally	Strong service/knowledge-based sector, particularly in urban areas	Lack of learning and networking platforms to develop connections with international markets	Fast growing creative/tourist sector with potential to create cross-border synergies and links with industries	Regional disparities in economic activities between rural and urban/coastal areas
Criterion 3: Cooperation between innovation stakeholders	Mixed economy with traditional industries and educational infrastructure	Low cooperation between business and research	Create synergies and transfer innovation between advanced and declining regions	Urban-rural disparities

In relation to smart growth, the South Baltic programme area ranks highly in the European Union's innovation rankings because it has a well-balanced and mixed economy with large traditional industries, strong educational infrastructure and a growing service sector. At the same time, the area has low levels of investment in R&D activities and weak collaboration between innovation stakeholders from business and research. Furthermore, SMEs suffer from weak internal innovation capabilities and there is a lack of knowledge development and sharing networks to help SMEs develop business models that promote access to new external markets. There is a strong potential creating synergies between innovation stakeholders across borders and regions, particularly in the green and blue growth sectors. This potential is, however, threatened by urban-rural economic disparities and interconnectedness, and brain drain leaving an unskilled work force.

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: environmental and cultural tourism	Large number of natural and cultural heritage assets for sustainable tourism	Unbalanced tourism both seasonally and geographically	High potential for cross-border ecotourism	Conflicts of interest between regions on tourism
Criterion 2: Marine Management	Strong marine management policy has stabilised marine life and biodiversity	High levels of Eutrophication and waste energy	Synergies between blue and green growth companies and joint energy-waste management	Climate change and high pollution levels
Criterion 3: cross-border environmentally friendly transport	Strong national and regional transport networks	Disparities in population between urban and rural areas affecting transport services	Potential synergies between sectors to develop blue-green technologies	Disparities between east and west in quality of transport systems

In the sustainable growth pillar, the South Baltic programme area has a strong natural and cultural asset base for tourism, a commitment to promoting biodiversity through marine management and reducing pollution through environmentally friendly transport. Weaknesses to sustainable growth include geographically unbalanced seasonal tourism, high levels of eutrophication and waste energy. There is a high potential in the programme area for creating synergies between sectors to help promote eco-tourism and developing blue-green technologies and environmentally friendly transport, but conflicts between regions on the focus of tourism, growing pollution levels and disparities between the quality of transport systems in the east and west remain challenges.

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: Employment	Labour market growth post financial crisis with low unemployment	Youth unemployment and lack of cross-border training	Potential for common cross-border labour initiatives	Unbalanced labour markets leading to brain drain
Criterion 2: Education	Strong educational infrastructure	Diversity in education systems	Increase coherence between education systems	Lack of educated people in blue and green growth sectors
Criterion 3: cross border cooperation	Strong willingness and experience of stakeholders in cross-border cooperation activities	Language barriers and a lack of SME engagement in cross-border activities	Improve cross-national administrative procedures, knowledge sharing and SME involvement	Lack of administrative capacity in small local communities

In the area of inclusive growth, the South Baltic programme area has a growing labour market and high levels of employment, a strong education system and a willingness among stakeholders to participate in cross-border activities. Youth unemployment remains an issue and lack of cross-border training schemes and cohesion between education systems reducing the opportunities for cross-border employment and causing brain drain. Furthermore, language barriers act as a further barrier in promoting cross-border activities. There is the potential to overcome these challenges by increasing the coherence between education systems and developing cross-border training and employment initiatives. The opportunity exists to improve cross border administrative procedures and knowledge sharing, but weak administrative capacity in small local communities is a challenge.

5.1.4 Main Challenge and Needs

Table 5.4: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	High levels of innovation due to well-balanced economy with tradition industries, education infrastructure and growing service sector.	Low R&D investment, weak collaboration between innovation stakeholders and low internal innovation growth capacities in SMEs.	Opportunities for synergies in blue and green growth sectors and knowledge transfer between urban and rural areas.	Brain drain and urban-rural disparities.

	Strengths	Weaknesses	Opportunities	Threats
Sustainable growth	Strong tourism sector and blue-green growth technologies	High pollution levels and unbalanced tourism both geographically and seasonally	Large potential for development of environmentally friendly transports and eco-tourism	Regional conflicts on tourism focus
Inclusive growth	Strong education systems	Youth unemployment	Synergies for cross-border education, training and employment	Unbalanced labour markets leading to brain drain

One of the main challenges for the South Baltic programme area is youth unemployment and brain drain. There is a need to create stronger synergies for cross-border training, education and employment initiatives, particularly in the blue and green growth area, to help increase youth employment rates. A perennial challenge in the programme area is to promote innovation capacities in SMEs. There is a need to increase collaboration between innovation stakeholders, particularly business and research, through creating synergies in the blue-green growth sectors. High levels of pollution and eutrophication remain a concern in the programme area, so there is a need to enhance synergies between blue and green growth companies in the development of environmentally friendly technologies and eco-tourism opportunities.

Strengths

The South Baltic Sea programme area has recovered from the financial crash and is doing well economically. Growth rates continue to rise along with employment levels in a strong labour market. Economic growth has been driven by domestic demand and high levels of public consumption due to increasing levels of income, low interest rates and high house prices. Education levels also remain very high in the region, particularly in relation to the tertiary and service sectors (see EUSBSR Report 2016 and State of the Baltic Region Report 2017).

Weaknesses

Productivity rates are beginning to fall in the region. While large industries continue to innovate and invest in R&D activities, SMEs cannot remain competitive due to low levels of investment and a failure to adopt digital business models that can connect their business to larger markets. While innovation rates remain high, the region still has relatively low rates of employment in new enterprises and struggles to get new research to the market place (State of the Baltic Region Report 2017). A key challenge in the region remains high levels of youth unemployment, particularly in old industrial towns and rural areas where education does not match with labour market demands. Gender inequalities also remain high on the agenda, particularly with regard to female employment rates (EUSBSR Report 2016 and State of Baltic Region Report 2017). Demographic challenges remain in the region with a declining and ageing population. Demographic disparities are present between urban areas growing in population and declining populations in rural areas caused by outmigration of high skilled workers in search of employment (State of the Baltic Region Report 2017). Immigration is

also putting a strain on transport and health services. Pollution levels are extremely high in the region, both in the air and at sea, the latter caused by high levels of shipping in the Baltic Sea. Large disparities also remain in accessibility levels and the quality of transport between urban and rural areas, which poses enduring challenges to remote areas (EUSBSR Report 2016).

Opportunities

There is a strong potential for growth in the bio-economy due to strong marine and land-based natural resources, with a need to encourage industries and businesses to work together in circular economy activities. The region also has high levels of digitalization which creates the possibilities for building the infrastructure to help SMEs digitalize their internal businesses processes and increase use of digital public services. The potential for enhanced cooperation in blue and green growth activities remain high, especially in the area of ecotourism. There is also an identified need for more collaborative governance measures to help cope with demographic pressures, improve accessibility and coordinate administration across borders (EUSBSR Report 2016).

Threats

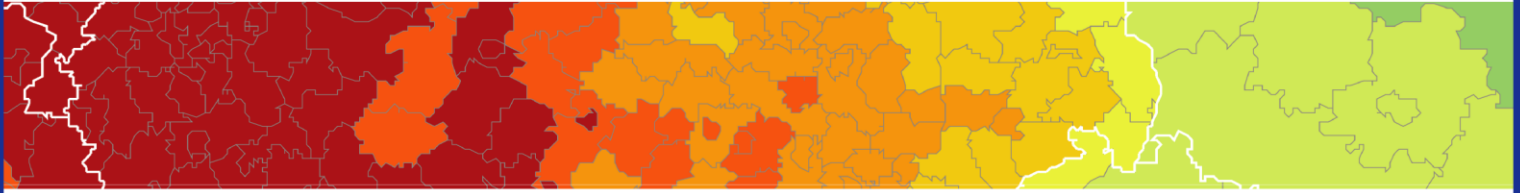
Climate change and growing pollution levels is a major threat to the environment and economy. Increasing global tensions between Russia and Europe, along with the rise and right wing populist groups, is a threat to democracy. Increasing migration pressure, youth unemployment and growing disparities between urban and rural area is also a predominate issue (EUSBSR Report 2016) .

References

2016 Implementation Report for the European Territorial Cooperation Goal for South Baltic Region

Ex-ante Evaluation Report of the Draft of South Baltic Cross-Border Cooperation Programme 2014-2020

Interreg South Baltic Programme 2014-2020 Programme



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

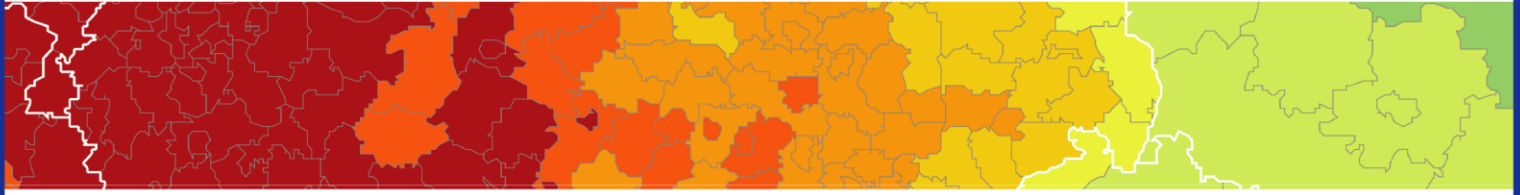
Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Inspire policy making by territorial evidence



TEVI – Territorial Evidence Support for European Territorial Cooperation Programmes

Targeted Evidence Support

Territorial Evidence Report

INTERREG B South West Europe

Territorial Evidence Report

This targeted evidence support activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

Information on ESPON and its projects can be found on www.espon.eu.

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This delivery exists only in an electronic version.

© ESPON, 2019

Printing, reproduction or quotation is authorised provided the source is acknowledged and a copy is forwarded to the ESPON EGTC in Luxembourg.

Contact: info@espon.eu

Territorial Evidence Report

**TEVI – Territorial Evidence Support
for European Territorial
Cooperation Programmes**

INTERREG B South West Europe

Version 13/08/2019

Table of contents

List of Figures	II
List of Maps	II
List of Tables	II
1 Introduction.....	1
2 Baseline Assessment and Territorial Characterisation	2
2.1 Context and programme area description.....	2
2.2 Contribution to EU 2020 strategy & situation in the programme area	2
2.3 Overview needs and challenges	2
2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives	3
3 Indicators	6
3.1 Initial result and output indicators used in assessment	6
3.2 Proposed Key Territorial Indicators.....	10
4 Benchmarking.....	14
4.1 Gross Value Added in Knowledge-Intensive Sectors	14
4.2 Innovation.....	17
4.3 Tourism and Sustainability.....	20
4.4 Regional Scoreboards.....	23
5 Reference Analysis	25
5.1 Territorial specificity of the programme area.....	25
5.1.1 Smart Growth	25
5.1.2 Sustainable Growth.....	27
5.1.3 Inclusive Growth	29
5.1.4 Main Challenge and Needs.....	30
References	33

List of Figures

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators	6
Figure 4.1: Regional Scoreboard.....	23

List of Maps

Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees	13
Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)	13
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises	16
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors	19
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions.....	22

List of Tables

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.	10
Table 5.1: SWOT Analysis Smart Growth	25
Table 5.2: SWOT Analysis Sustainable Growth.....	27
Table 5.3: SWOT Analysis Inclusive Growth.....	29
Table 5.4: SWOT Analysis Overall Challenges and Needs	30

1 Introduction

The delivery of Territorial Evidence Reports represents one of the main outputs of this project. Those reports intend to go beyond the provision of input to policy processes and thoroughly present comparable evidences and key territorial development trends from a forward-thinking perspective. The underlying logic of developing such an evidence-informed document dovetails the need for scientific information providing, to the extent possible, an unambiguous unquestionable basis for policy intervention. The territorial evidence reports are accordingly meant to present a comprehensive framework supporting the development of an interactive relationship between evidence and policy.

The territorial Evidence Reports are produced for the twelve INTERREG A and B programmes, which are participating in the *ESPON Territorial Evidence Support for ETC Programmes Project*. The 12 Programmes are presented in the textbox below.

- INTERREG B Mediterranean
- INTERREG B South-West Europe
- INTERREG A Italy-Croatia
- INTERREG A Italy-Austria
- INTERREG B North-West Europe
- INTERREG B Central Europe
- INTERREG A Austria-Czech Republic
- INTERREG A Deutschland-Nederland
- INTERREG A Central Baltic
- INTERREG A South Baltic
- INTERREG A Sweden-Denmark-Norway
- INTERREG A Two Seas Programme

The reports focus on the scrutiny of each territories' characteristics, illustrated by their selected thematic priorities, specific programme objectives and indicators, to better identify, target and depict the territories' specificities. As such, Territorial Evidence Reports have a common structure that allows characterising programme areas in a comparable way. Furthermore, the evidence gathered in the reports also aims to capture the specificities of each programme area.

2 Baseline Assessment and Territorial Characterisation

2.1 Context and programme area description

The programme covers regions in Spain, France, the UK (Gibraltar), and Portugal, and spans coastal and inland areas. The areas were particularly strongly affected by the consequences of the economic crisis, which translates to consistent and negative (or close to zero) percent GDP growth, as well as limited convergence in relation to the European average in per capita figures. The primary and service sectors contribute relatively more to the economy, the industrial sector relatively less, than the European average. The programme volume amounts to approximately € 141,879,979, of which € 106,810,523 stems from ERDF funding, with the remainder stemming from national and private co-funding.

2.2 Contribution to EU 2020 strategy & situation in the programme area

Smart Growth: priority challenge for the SUDOE space for the 2014-2020 period; significant progress made since last period.

Sustainable Growth: Owing to its endogenous characteristics and the potential of its territory and its socioeconomic dynamics, the sustainable aspect of growth represents an opportunity for relative specialisation and differentiation of the SUDOE space on a European level.

Inclusive Growth: SUDOE space is promoting the creation of employment by the actors involved, through the existence of initiatives at regional, national and community level to directly address the aspects of employment and unemployment; direct support measures in favour of job creation.

2.3 Overview needs and challenges

SUDOE is characterised by coastal-inland pairing (most metropolitan centres are coastal). SUDOE space has been particularly affected by negative effects of economic and financial crisis – low economic growth, stagnation of the GNP growth. There is a sharp increase of unemployment, worst in Portugal and Spain as well as a problem of youth unemployment. Some regions of the SUDOE space stand out in some sectors and are ready to assume a leading role at a European level in certain sectors (renewable energies, the aerospace industry, the automotive supplier industry, textiles, and footwear, for example). Productive structure of the transnational space is almost exclusively to be found in SMEs (which represent 95% of the total number of existing companies), mainly service sector. SMEs have a limited capacity for innovation and for penetrating foreign markets, and are more vulnerable. Average level of R&D is low, improvements have been made; R&D is concentrated in some clusters. In terms of education, drop out is considered to be too high. In regards to the environment, there is a great diversity and an opportunity for tourism (20% of SUDOE is included in Natura 2000 Network). The territory however faces threats from urban growth and agricultural overexploita-

tion, and also natural recurrent risks common to the transnational area (fires, earthquakes, drought, erosion, desertification, and floods). There is also the problem of overall water scarcity – in the South desertification and soil erosion are increasing. Considerable (negative) effects of climate change are to be expected and to increase inequalities within SUDOE.

2.4 Overview on the selected Thematic Objectives, Priority Axis, Investment priority, specific objectives

Specific objective 1b-1: Strengthening the Synergic and networking operation of R+i at a transnational level in the specific SUDOE sectors as from smart specialisation

Specific objective 1b-2: Developing dissemination of applied research related to essential facilitating technologies

Priority Axis 1: Promoting research, technological development, and innovation (TO1, IP 1b)

- **Brief justification:** the projects developed in the 2007-2013 programming period have already contributed to the creation of networks of cooperation and excellence in R&D+i that have enabled scientific, technological and educational institutions in the region to achieve research results with high added value at regional and European level. Those projects shall be continued.
- **Main change sought:** the objective aims to correct the imbalances between regions in terms of investment in R&D+i through the strengthening of networks in sectors of excellence identified in the framework of RIS3 strategies
- **Expected activities:** The active and efficient involvement of SMEs, which represent practically the entirety of the productive fabric of the SUDOE space, is a relevant element for the success of this specific objective. This involvement would improve the level of collaboration in activities of R&D+i activities and would contribute to a greater level of private investment in R&D+i and improved levels of the transfer of technology to the market. Activities include the creation or consolidation of collaboration platforms, developing models for transferring technology of innovation management and of open innovation
- **Beneficiaries:** public and private R&D+i actors

Specific objective 3a_1. Developing capacities for the improvement of the environment of SMEs in the SUDOE space

Specific objective 3b_1 Improvement and increasing of the possibilities for the internationalisation of SMEs

Priority Axis 2: Improving the competitiveness of SMEs (TO3, IP 3a, 3b)

- **Brief justification:** the fomenting of an economy concentrating on knowledge and innovation must, of necessity, be associated with the strengthening of the productive structure of the SUDOE space.
- **Main change sought:** help improve the conditions of the context in which companies operate, strengthening institutions, services, and mechanisms supporting their development and internationalisation
- **Expected activities:** Promoting entrepreneurship, in particular by facilitating the economic exploitation of new ideas and fostering the creation of new firms, including through business incubators. Developing and implementing new business models for SMEs, in particular with regard to internationalisation
- **Beneficiaries:** public institutions supporting companies and start-ups

Specific objective 4c_1 Improving energy efficiency policies and the use of sources of renewable energies in public buildings and housing through the implementation of networks and joint experimentation

Priority Axis 3: Encouraging the transition to a low-carbon economy in all sectors (TO4, IP 4c)

- *Brief justification:* justified due to the buildings mean near a half of all the energy consumption and it is the origin of 1/3 of the greenhouse gases; therefore, the energy refurbishment in buildings and houses may have a remarkable impact
- *Main change sought:* the consumption of renewable energies by public infrastructure and buildings should result in improved energy efficiency and consolidation of an economic development model based on green and ecological growth.
- *Expected activities:* Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector
- *Beneficiaries:* public and private actors in the sector, economic operators, clusters and poles of competitiveness

Specific objective 5b_1: Improving the coordination and effectiveness of prevention, disasters management and rehabilitation tools of damaged areas

Priority Axis 4: Encouraging adaptation to climatic change and risk prevention and management (TO5, IP 5b)

- *Brief justification:* justified by the geographical characteristics of the SUDOE space whose territory is faces natural risks already present and other potential risks resulting from the impact of climate change. These risks are associated with the scarcity of water resources and high temporal and spatial variability of rainfall which favours the intensification of drought conditions, forest fires, desertification, soil erosion and cyclical flooding.
- *Main change sought:* development of strategies, methods and of common coordination activities, considered as more effective than a set of specific and individual actions.
- *Expected activities:* measures include the design of emergency plans, set up of early warning systems, development of transnational risk management tools.
- *Beneficiaries:* public and private bodies: national, regional, local authorities, business associations or companies specialised in territorial diagnostic

Specific objective 6c_1 Improving management methods of the common natural and cultural heritage through the implementation of networks and joint experimentation

Specific objective 6d_1 Reinforcing the cooperation of the SUDOE stakeholders of the natural sites through the development and the use of joint methods

Priority Axis 5: Preserving and protecting the environment and promoting the efficient use of resources (TO6, IP 6c, 6d)

- *Brief justification:* justified by the existence of extensive forest areas, natural spaces, protected areas, etc. that need more exigent intervention methods if they are to guarantee their resilience regarding natural risks and those created by man (acting as a complement to OT5)
- *Main change sought:* the SUDOE space has a marked rurality, a great biodiversity, and an extremely rich natural and cultural heritage that needs not only to be protected but also to be encouraged as to making use of it and contributing to local development in a sustainable manner.

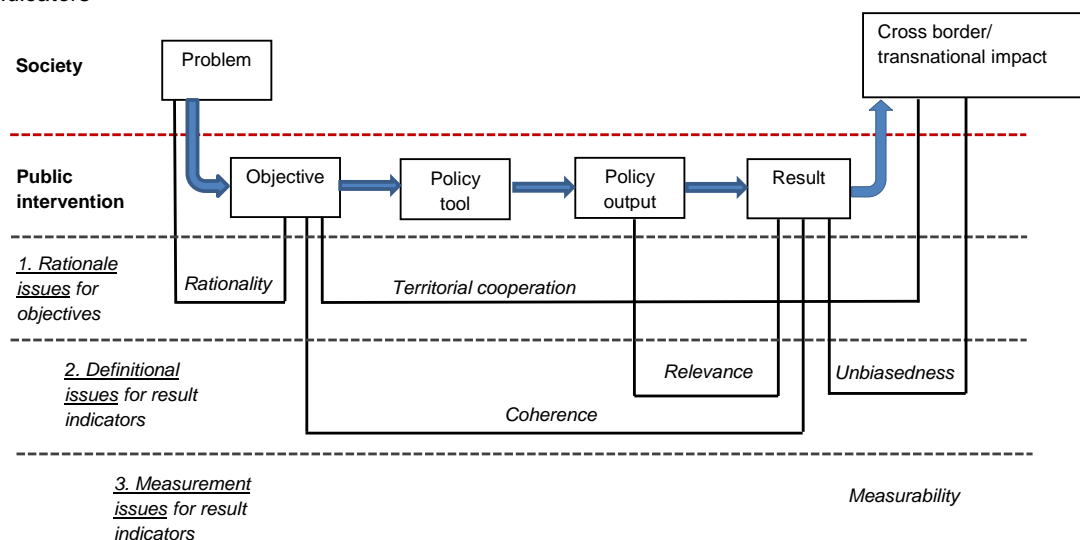
- *Expected activities:* Development of a network for experimentation and capitalisation of innovative methods for management and conservation of the spaces that may contribute to a high improvement of the strategies of the pertinent local stakeholders.
- *Beneficiaries:* public and private actors, specialists in tourism, environmental sector.

3 Indicators

3.1 Initial result and output indicators used in assessment

The definition of reliable result indicators for INTERREG policies must be based on a set of objective criteria, able to overcome all the potential issues arising in this process. Figure 3.1 shows the conceptual framework developed by Politecnico di Milano within the Territorial Evidence project in order to guide policy makers in the identification of appropriate result indicators.¹

Figure 3.1: The logical model of public intervention and the criteria for the definition of appropriate result indicators



Source: adapted from Osuna et al. (2000)

The public intervention requires some logical steps, namely:

- the identification of the problem, on which the *objectives* of the public intervention focus;
- the *policy tools* for the implementation of specific actions to solve the problem;
- the identification of specific *outputs* (i.e. the specific actions) which, in turn, will lead to
- *results*, meant as the contribution of the policy to the achievement of the objectives defined.

Result indicators are those indicators measuring project results relative to project objectives, as they monitor the progress towards the explicit targets defined in the beginning of the logical chain (Mosse and Sontheimer, 1996).

The first step is to take into consideration *rational issues for the identification of objectives* that motivates the policy action.² In other words, these issues are preliminary to the definition of result indicators but, nevertheless, fundamental for their identification:

- the project objectives have to be defined in a clear and unambiguous way, fitting properly the problem they are related to. If this is not the case, it would not be possible to

¹ This framework was discussed in details in section 2.2 of the Inception Report.

² Examples of rational issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.2.

meaningfully measure the progress towards the targets of the policy, since the targets themselves would not be clear. The first issue in the identification of appropriate result indicators is defined as the *rationality* of the policy objective (Figure 2). Rationality measures the level of understanding, transparency and accurateness of the policy objectives relative to the societal problem addressed;

- the objectives have to have a clear focus on *territorial cooperation*, i.e. it must be evident that the INTERREG Programme is not just a substitute for a policy of any other kind (either regional or national) but, rather, its goal is strictly focused on a cross-border territorial dimension.

The second step is the *definitional issues for results indicators*³:

- result indicators must be fully consistent with the objectives of the policy, as they have to correctly measure the targets set by the public intervention. In other words, there is an issue of *coherence* linking objectives and result indicators (Figure 3.1): if a mismatch arises between these two elements, the monitoring of the policy achievements would be flawed and arbitrary;
- at the same time, it is important for the result indicators to capture a result of the project, rather than an output. The difference between outputs and results must be made explicit, in order to avoid confusion between the two concepts. Outputs are the products generated by the policy in order to achieve certain results. In this sense, the output is not the final goal of the policy, but rather the mean through which the policy objective is pursued (OECD, 2009). The results, on the other hand, represent the extent to which the objective of a policy has been achieved. For instance, a transportation policy could involve the investment of some funds (tools) for the building of a new highway (output) in order to decrease travel time of commuters (result). A policy for unemployed people could invest public resources (tools) for the organization of training courses (output) which will make it easier the reintegration in the job market (result). The *relevance* of result indicators (Figure 3.1) measures the extent to which the indicator is capturing a result rather than an output;
- the last logical link in Figure 3.1 links the results of the policy to its impact on the society (Hempel and Fiala, 2011). The policy impact is defined by the long-term effects on specific dimension of well-being and living standards of the population targeted by the policy (McCann and Ortega-Argilés, 2015). These long-term effects depend on a variety of different factors, most of them not under the control of the policy maker (World Bank, 2004). The policy results, on the other hand, are short or medium-term effects, directly resulting from the outputs generated by the policy. In other words, the causal link between policy results and impacts is not as evident as the one between outputs and results. It is therefore extremely important, for the result indicators, to capture the *net* effect of the policy actions on the defined targets, obtained when the result is free from, and *unbiased* with respect to, other on-going actions and processes.

If *rationality* and the focus on *territorial cooperation* represent the prerequisites for the definition of the result indicators, since they relate to the specification of the policy objectives, *relevance*, *coherence* and *unbiasedness* refer to the appropriate definition of result indicators, and therefore they another conceptual level with respect to rationality and territorial cooperation in the logical framework showed in Figure 3.1.

³ Examples of definitional issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.3.

Once result indicators are defined in terms of rationality, territorial cooperation, relevance, coherence and unbiasedness, the logical approach moves to a third level, concerning the *empirical measurement* of the indicators and the potential issues involved in this phase (Figure 3.1).

Moving from the general definition of a result indicator to its empirical measurement implies some critical issues, entering the problem of *measurability*.⁴ The criteria have to reflect specific characteristics that results indicators should have. Results indicators should in fact be:

- *objective*: results have to be measured in an objective way. They have therefore to be as insensitive as possible to different methodologies and approaches for their collection, and have to provide a straightforward interpretation of the change occurred. In this sense, quantitative indicators are preferable to qualitative ones;
- *consistent over time*: since result indicators should monitor the gradual approach towards the specific targets set by the policy maker, it is important for their empirical measurement to be regularly available over time, without long time lags (Schumann, 2016).
- *comparable*: to the broadest extent possible, indicators should allow a comparison with other policy contexts, so to understand whether the change occurred is more or less relevant.
- *available at affordable prices*: since the collection of indicators is a costly procedure, especially for qualitative data such as surveys and focus groups, the budget devoted to the measurement phase has to be carefully planned. Whenever possible, without decreasing the quality of indicators, existing data sources should be used for this purpose (OECD, 2015).

These criteria have been presented, discussed and validated with the stakeholders in the first round of workshops. In what follows, we will apply the different criteria to the current result indicators proposed by the 12 INTERREG Programmes, and highlight examples of high or low quality of the indicators suggested in the programmes according to the different criteria. This analysis has two goals. First, it will inform about the fulfilment of the different criteria, pointing out the most relevant issues encountered in the definition of the current result indicators. Second, it will provide useful examples to be included in the guidelines for the policy makers, making them aware of the potential mistakes to be avoided.

While the assessment of the current result indicators was conducted on the whole set of indicators proposed by the 12 Programmes, in the following lines we will report anonymized examples of both unsatisfactory and satisfactory indicators. This is due to the objective of the project not being an evaluation of the Programmes but, rather, the development of a general approach to the definition of appropriate result indicators that could be applied to any INTERREG action.

⁴ Examples of measurable issues on the proposed results indicators in the 12 INTERREG Programmes are presented in section 2.2.4.

Thematic objective	Specific objective	Result indicator	Rationality	Territorial cooperation	Coherence	Relevance	Unbiasedness	Measurability
1	Strengthening the synergic and networking operation of R&D at transnational level in the specific SUDOEE sectors as from smart specialisation	Collaborative networks developing transnational R&D activities in the priority sectors of the SUDOEE area (% of networks in relation to the total number of existing networks in the SUDOEE area)	HIGH	HIGH	MEDIUM - The share of transnational R&D networks could increase due to a reduction of the total number of networks	HIGH	MEDIUM - The share of transnational networks could be affected by exogenous factors (e.g. national policies, change in accessibility)	MEDIUM - An issue could be represented by differences in the empirical measurement of R&D networks
1	Developing dissemination of applied research related to essential facilitating technologies	New technologies applied within the SUDOEE area (% of research centres and companies with the capacity to implement them in their activities)	MEDIUM - The promotion of the participation in R&D project promotes the creation of new knowledge and technologies, not necessarily their adoption	HIGH	LOW - The adoption of new technologies, at least to a certain extent, can be independent from the participation in R&D projects	HIGH	LOW - Several exogenous factors have an impact on the decision of firms to adopt new technologies (e.g. labour cost, change in the price of some inputs)	LOW - The capacity to adopt new technologies is difficult to be measured
3	Developing capacities for the improvement of the environment of SMEs in the SUDOEE space	Development of the business environment in the SUDOEE area (% of the regions which have improved)	MEDIUM - The business environment is a quite broad concept, what are the weaknesses (administrative, commercial, etc.) that the Programme is addressing?	MEDIUM - The transnational dimension is not fully clear (is the Programme dealing with transnational barriers?)	HIGH	HIGH	LOW - Several exogenous factors have an impact on the business environment (institutional elements, conditions of the job market, presence of educational institutions)	LOW - The definition of business environment is unclear
3	Improvement and increasing of the possibilities for the internationalisation of SMEs	Improvement of the conditions for the internationalisation of SMEs in the SUDOEE area (% of the regions which have improved)	HIGH	HIGH	HIGH	HIGH	LOW - Several exogenous factors have an impact on the propensity of firms to internationalise (institutional factors, exchange rates, conditions in the job market)	LOW - The conditions for the internationalisation are difficult to be defined and measured
4	Improving energy efficiency policies and the use of renewable energy sources in public buildings and housing through the implementation of networks and joint experimentation	Percentage of actors in the energy efficiency sector involved in transnational cooperation projects (% of actors)	HIGH	HIGH	LOW - The territorial cooperation dimension is more evident, but it is not clear how this result will contribute to the achievement of the specific objective	LOW - It is not clear how the outcomes of the Programme are expected to contribute to this result	LOW - Several exogenous factors have an impact on the propensity of the actors to cooperate with foreign partners (institutional factors, conditions in the energy market)	MEDIUM - Transnational cooperation projects can be traced, but the cost for the collection of these data could be high
5	Improving the coordination and effectiveness of prevention, disasters management and rehabilitation tools of damaged areas	Percentage of the territory covered by transnational risk prevention and management tool (% of territory)	HIGH	HIGH	MEDIUM - The share of the territory covered is not necessarily capturing the people involved by the actions and the indicator is not dynamic	MEDIUM - it is not clear how much the risk is reducing. The extent could be different in different areas covered by the Programme	HIGH	MEDIUM - Differences in administrative rules could limit the comparability of the results also within the Programme areas
6	Improving management methods of the common natural and cultural heritage through the implementation of networks and joint experimentation	Percentage of natural and heritage sites involved in transnational sustainable development strategies (% of sites)	HIGH	HIGH	MEDIUM - The sites not covered by transnational strategies could not need them because they are already involved in national/regional actions of the same kind	HIGH	HIGH	LOW - A common definition across countries of "cultural site" and "natural site" is not available. Comparability among countries is therefore limited
6	Reinforcing the cooperation of the SUDOEE stakeholders of the natural sites through the development and the use of joint methods	Percentage of protected sites involved in transnational strategies (% of protected sites)	HIGH	HIGH	MEDIUM - The sites not covered by transnational strategies could not need them because they are already involved in national/regional actions of the same kind	HIGH	HIGH	LOW - A common definition across countries of "protected sites" is not available. Comparability among countries is therefore limited

3.2 Proposed Key Territorial Indicators

Table 3.1 provides a list of result indicators using the multicriteria approach discussed above. The first column of the table shows the specific goal of the policy, while the second one reports the proposed result indicator. The latter has to be intended as the aggregation of the empirical measurements of the *change* in the single indicators listed. The first row of the table is therefore fully correspondent to the example described in the present section. The change in the number of tourists, the variation of seasonality and the change in the number of sites in good conditions have to be aggregated in one single indicator, according to the policy priorities.

The second and third rows provide other two examples, for which an empirical measurement has been provided and mapped.⁵ In the first case (second row) the specific objective consists in increasing employment and self-employment in microenterprises. The expected results of these actions can be identified in both an increase of entrepreneurship in the area and a positive change of the employment in microenterprises. Therefore, a result indicator for this policy could be represented by the combination of the number of new firms and the change in employment in enterprises with 1-9 employees. Notice that, in this case, trade-offs between the achievements of the two different objectives are not likely to occur. The weights associated to each of these two indicators depend on the priorities of the policy, and whether they are more oriented towards either the creation of job places or the entrepreneurship promotion.

Table 3.1: Shortlist of proposed result indicators using a multicriteria approach.

Specific objective	Proposed result indicator (as a change in the listed variables)
To improve capacities for the sustainable use of cultural heritage and resources	Tourism presences + tourism seasonality + natural sites in good conditions
Promoting an increased employment in self-employed businesses, micro enterprises and start-ups	Number of new firms (1-9 employees) + number of employees in enterprises with 1-9 employees
Fostering the innovative potential of the region	Patent application in the relevant sectors + trademark applications in the relevant sectors
Increase the applied research and innovation oriented activity in the area	Share of R&D expenditure in % of the regional GDP + number of trademark application + number of patent applications
To facilitate the implementation of low-carbon, energy and climate protection strategies to reduce GHG emissions	CO ₂ emissions + N ₂ O emissions
More exports by the companies of the area to new markets	Increase in export + share of export towards non EU/EFTA markets
Improved services of existing small ports to improve local and regional mobility and contribute to tourism development	Number of tourists + index of concentration of tourists per port of arrival

⁵ The measurement and mapping exercise is purely demonstrative. The period over which the change of the single indicators has been measured is 2008-2013. The source of the data employed in the analysis is EUROSTAT. Some regions are missing because no evidence was available for them. The aggregation rule applied for the empirical examples is the calculation of the arithmetic mean of the indicators.

Specific objective	Proposed result indicator (as a change in the listed variables)
More people benefiting from stronger communities in the area	Composite indicator of indexes of social inclusion (: people under poverty threshold, long-term unemployment rate, etc.)
Increase the development of social innovation applications in order to make more efficient and effective local services to address the key societal challenges in the area	Number of IP + households with access to internet + households with access to broadband connection + households who use internet for interactions with the PA
Improve the quality, safety and environmental sustainability of marine and coastal transport services and nodes by promoting multimodality in the area	Goods transported by sea + average age of the ships + number of accidents
Make natural and cultural heritage a leverage for sustainable and more balanced territorial development	Number of tourists + seasonality in tourism

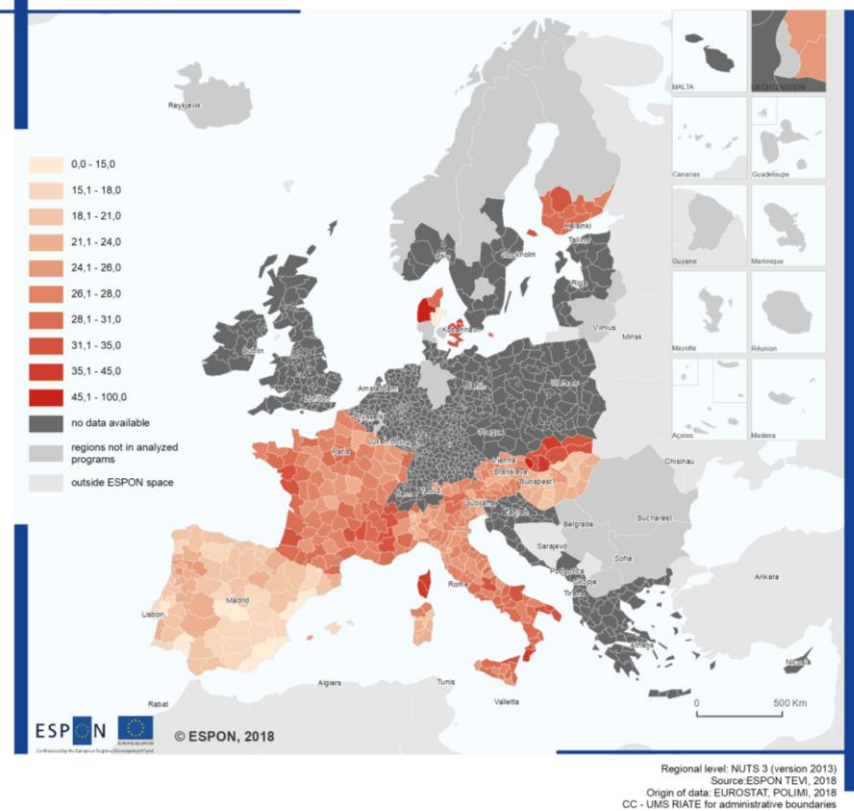
The third row of Table 3.1 reports an example of a policy aimed at fostering the innovative potential of the region. In this case, the objective consists in the creation of knowledge and innovation in the Programme area. Since innovative products may take different forms, a single indicator would probably be biased, taking into account only one of them. For this reason, the proposed result indicator is represented by the combination of the variation in both patent and trademark applications. Again, the way in which these two indicators are aggregated depends on the priorities of the Programme, and on the focus of the policy action.

Going one step further from the assessment conducted under 3.1 and the shortlisted result indicators presented in the preceding paragraphs, synthetic result indicators are presented in the table below. These indicators stem from the gaps identified in the assessment of the individual result indicators used by the programme vis-à-vis the overarching ETC intervention logics.

Programme	Thematic objective	Specific objective	Output indicator	Result indicator	Proposed result indicator
South West (1)	1	Strengthening the synergic and networking operation of R&D at transnational level in the specific SUDOE sectors as from smart specialisation	CO1: Number of enterprises participating in cross-border, transnational or interregional research projects (Number of companies) CO2: Number of research centres taking part in cross-border, transnational or interregional research projects (Number of research centres)	Collaborative networks developing transnational R&D activities in the priority sectors of the SUDOE area (% of networks in relation to the total number of existing networks in the SUDOE area)	Co-patenting and citations by cross-border actors (to be controlled for other influential factors through DID)
South West (2)	1	Developing dissemination of applied research related to essential facilitating technologies	CO1: Number of enterprises participating in cross-border, transnational or interregional research projects (Number of companies) CO2: Number of research centres taking part in cross-border, transnational and interregional research projects (Number of research centres)	New technologies applied within the SUDOE area (% of research centres and companies with the capacity to implement them in their activities)	Number of trademarks in essential technologies (to be controlled for other influential factors through DID)
South West (3)	3	Developing capacities for the improvement of the environment of SMEs in the SUDOE space	O1: Business development systems created or supported by the SUDOE Programme (Number of services) CO1: Number of enterprises receiving support (Number of enterprises) CO2: Number of enterprises receiving non-financial support (Number of enterprises)	Development of the business environment in the SUDOE area (% of the regions which have improved)	REDI survey data on entrepreneurial risk
South West (5)	4	Improving energy efficiency policies and the use of renewable energy sources in public buildings and housing through the implementation of networks and joint experimentation	O1: Number of pilot actions developed for improving energy efficiency in buildings (Number) O2: Number of tools and services developed to improve the energy efficiency of buildings (Number)	Percentage of actors in the energy efficiency sector involved in transnational cooperation projects (% of actors)	CO2 emissions (to be controlled for other influential factors through DID)

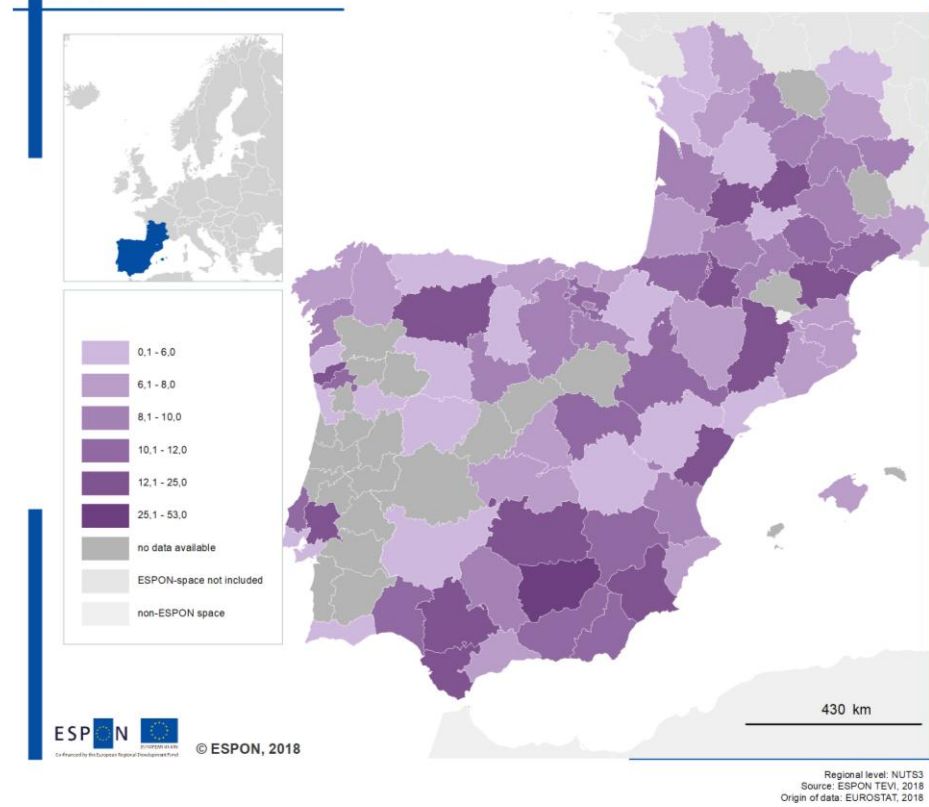
Map 3.1: Composite indicator: Change (2008-2013) in number of new firms (1-9 employees) and number of employees in enterprises with 1-9 employees

Composite Indicator: change (2008-2013) in number of new firms (1-9 employees) + Number of employees in enterprises with 1-9 employees



Map 3.2: Composite indicator: Patent applications and trade-mark applications (change 2008-2013)

Composite Indicator: patent applications + trade-mark applications (change 2008-2013)



4 Benchmarking

4.1 Gross Value Added in Knowledge-Intensive Sectors

The maps below present the synthetic composite indicator *Gross Value Added* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Gross value added approximates the value of goods and services produced in a given geographical dimension (in this case NUTS-3) over a defined timeperiod. The composite indicator reflects the gross value added of knowledge intensive services and industries in a given area.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of knowledge-intensive economic activities. The indicator is calculated in the following manner:

$$GVA_{i,t} = \frac{1}{2} * Y_{i,t} + \frac{1}{2} * E_{i,t}$$

In which the variable $Y_{i,t}$ represents normalised gross value added by knowledge intensive industries in region i and at time t , Analogously, $E_{i,t}$ represents normalised employment in a given region i and at time t . Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$E_{i,t} = (e_{i,t} - \min(e_{i,t})) / (\max(e_{i,t}) - \min(e_{i,t}))$$

As data sources, Eurostat data is used. Gross value added by knowledge intensive industries is represented by the indicator *Gross value added of financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities*⁶ of the NACE data set and the corresponding employment indicator of the NACE data set for the same economic activities⁷

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator GVA. A minimum of 0.2 can be observed, with corresponding maximum of 200. Maxima are found along urban centres, especially in Madrid and Barcelona.

Within the European context, developments in gross value added, as signified with increases in output (due technological development) and employment (in knowledge intensive sectors), is concentrated on urban regions, generally capital regions. Within this context, centres of excellence in the programme area (such as Madrid and Barcelona) strike out particularly in relation to other urban centres of the programme area, signalling that developments in tech-

⁶nama_10r_3gva

⁷nama_10r_3empers

nological progress within the economy have generally occurred heterogeneously across the programme area.

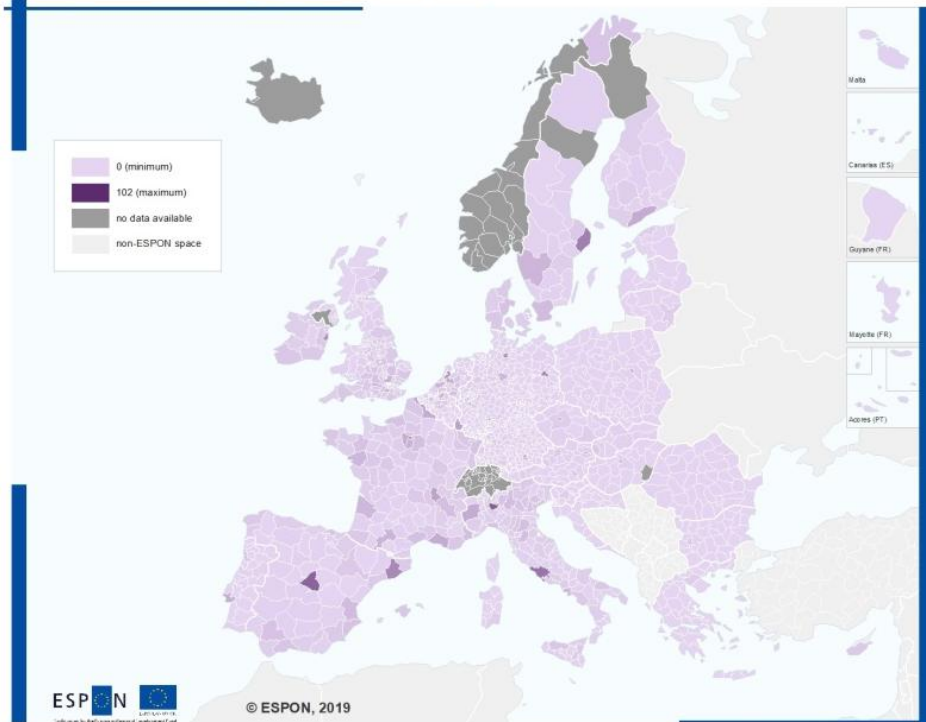
Regions of Madrid and Barcelona are clearly standing out in the SUDOE context. There are few other regions which show slightly higher values, however large portions of the programme area do not stand out. This suggests that the two Spanish cities are strongest in regards to the environment for knowledge intensive sectors. Possibly, due to their outlying character, of more subtle differences between remaining regions are not well observable. Other regions such as (Lisbon, Beiras e Serra da Estrela, Valencia, Sevilla, Malaga, Haute-Garonne, Gironde) belong to better performing regions.

In the European context the picture of the SUDOE area does not change to a great extent.. Most better performing regions in the SUDOE context (Lisbon, Beiras e Serra da Estrela, Valencia, Sevilla, Malaga, Haute-Garonne, Gironde) maintain their well-performing status also in the European context. The rest of Europe is rather homogenous and is characterized by low indicator values. Outside of the SUDOE are there are few other regions where high values can be observed and these are urban areas around Milano, Rome and Stockholm as well as French regions. Generally, SUDOE`s Spanish and French regions are notably more pronounced.

Lowest indicator values are present in all three SUDOE countries outside of regions with urban centres. This suggests that best environment for knowledge sensitive sectors is present in regions with urban centres.

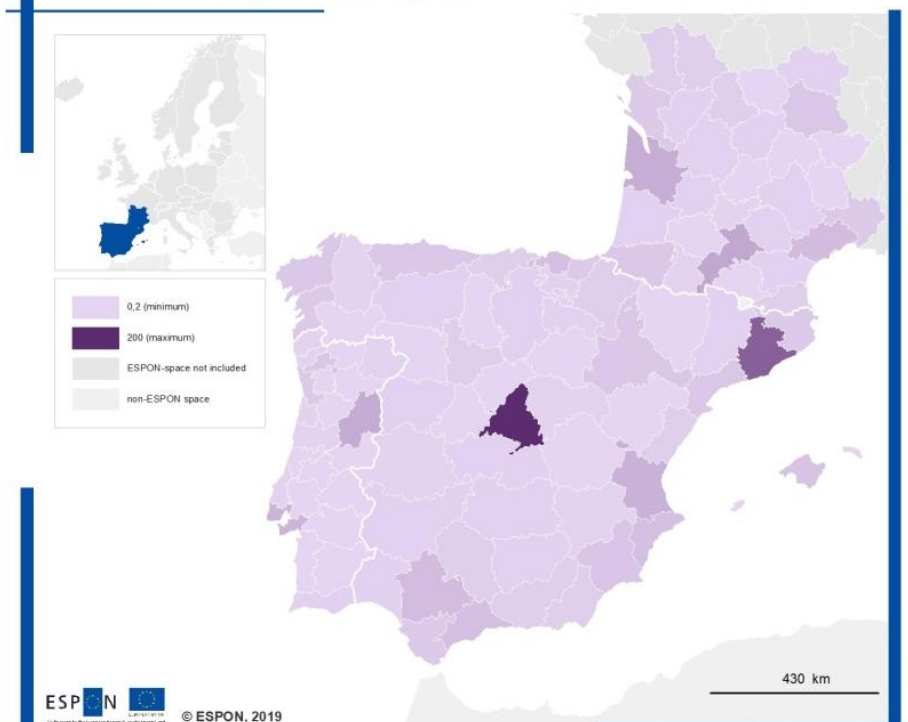
Map 4.1: Synthetic indicator: People employed in knowledge intensive sectors + value added of knowledge intensive enterprises

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR
 © UMS RIATE for administrative boundaries

Synthetic indicator: people employed in knowledge intensive sectors + value added of knowledge intensive enterprises



Regional level: NUTS3 (version 2013)
 Source: ESPON TEVI, 2019
 Origin of data: EUROSTAT, PoMI, OIR

4.2 Innovation

The maps below present the synthetic composite indicator *Innovation* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. Innovation in the framework of the indicator is restricted to technical innovation via patent and trademark registration, thus not necessarily reflecting the status of social innovations. The composite indicator quantifies the innovation outputs undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework innovative economic activities. The indicator is calculated in the following manner:

$$Innovation = \frac{1}{2} * P_{i,t} + \frac{1}{2} * T_{i,t}$$

In which the variable $P_{i,t}$ represents normalised patent application values per NUTS-3 region to the European Patent Office in region i and at time t . Analogously, $T_{i,t}$ represents normalised trademark applications in a given region i and at time t . Thus, the indicator captures scientific and technical innovation, in addition to capturing process innovation via new products and similar by companies. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$P_{i,t} = (p_{i,t} - \min(p_{i,t})) / (\max(p_{i,t}) - \min(p_{i,t}))$$

As data sources, Eurostat data is used. As EPO patent applications per NUTS-2⁸ were discontinued after 2012, data transformation methods were used to obtain more recent proxy values. The indicators were broken down to NUTS-3 level and extrapolated with the trademark growth rates (2012 to 2016) under the assumption that product and scientific innovation occurs at approximate pace. Trademark values on NUTS-3 level are obtained via the indicator European Union trade mark (EUTM) applications by NUTS 3 regions⁹.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 0.2 can be observed, with corresponding maximum of 104.4.

In the European context, innovation (measured by patent and trademark application) is concentrated along urban areas and clusters of R&D institutions. These regions tend to be relatively richly endowed in human capital with strong research institutions. Varying patterns can be identified. In some areas, a concentration of innovative activities to regional centres, generally capital cities, can be observed. This pattern is strongly observable on the Iberian peninsula

⁸ tgs00041

⁹ ipr_ta_reg

with regional extrema in Madrid and Barcelona. Surrounding regions of these centres tend to feature a very low degree of innovative output. Another observable pattern are large clusters of regions, featuring moderate to high innovation output. These clusters generally rank in the mid-fields in terms of absolute indicator scores. Examples of these (sometimes large) clusters include Northern Italy (with a regional extrema in Milano and a surrounding cluster of moderately to well scoring regions), the Dutch region of Holland and Southern Germany.

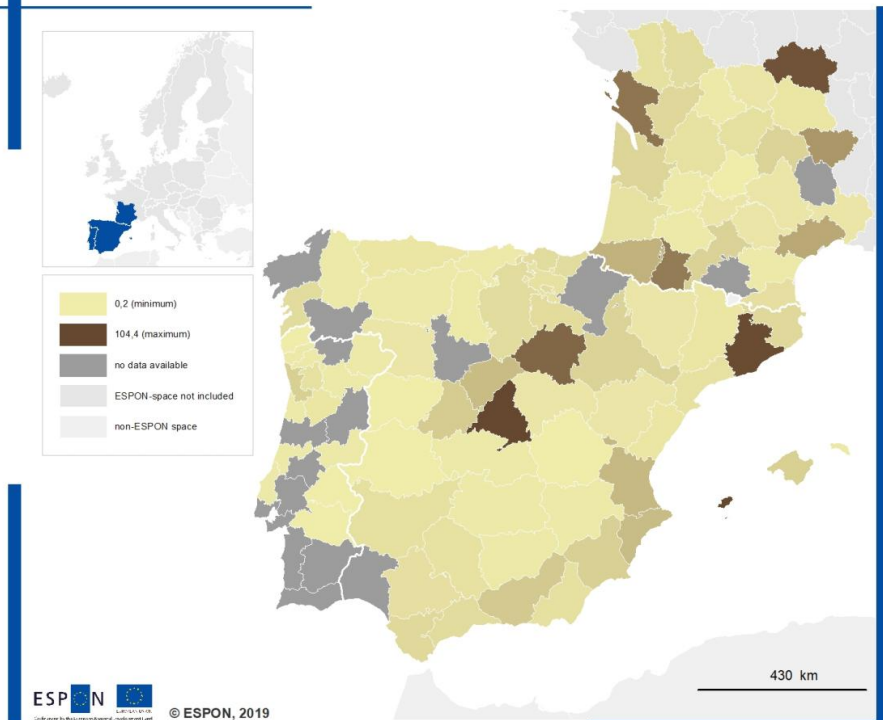
There are clear well-performing regions: Madrid, Soria, Barcelona, Hautes-Pyrénées, Charente Maritime, Allier, and Ibiza. The picture of SUDOE regions is rather heterogenous which suggests that its regions have different values of this synthetic indicator. These regions, thus, can be understood to produce highest number of patent and trademark application with could be understood as a manifestation of their economic and innovative activity. While it can be expected that urban centres such as Madrid and Barcelona perform well, outlying character of some regions is interesting. For example, it is interesting to see Ibiza, a typically touristic island, among those with highest indicator values.

Many of SUDOE's regions with highest values retain their values in the European context. In fact, Madrid and Barcelona, are, next to Kainuu in Finland, Blekinge in Sweden, Milano and South Burgenland in Austria, one of the best performing regions in Europe. Many other SUDOE well-performing regions (Soria, Hautes-Pyrénées, Charente Maritime, Ailler, Haute Loire and Hérault), are visible in darker shade also in the European context. This suggests that some of SUDOE's regions perform relatively well compared to the rest of Europe in regards to synthetic indicator Innovation.

Nevertheless, while many Spanish and French regions have high indicator values, none of Portuguese regions seem to have a particularly higher value of this indicator. However, it should be observed that many Portuguese regions data is not available. In general, however, all the countries are characterized by presence of large portions of regions where there little patent- and trademark-related activities.

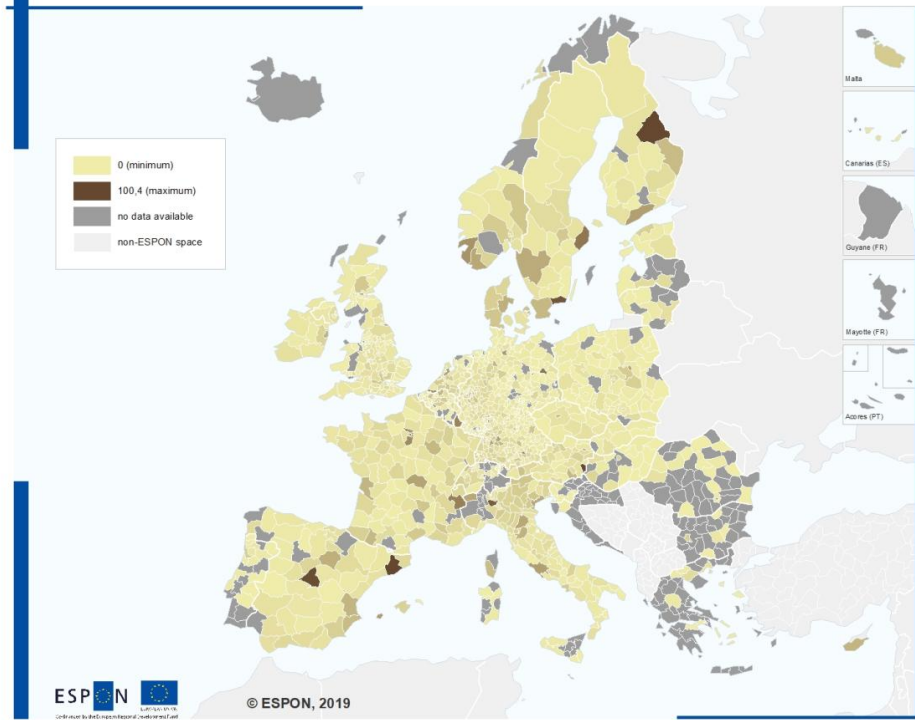
Map 4.2: Synthetic indicator: Patent application in the relevant sectors + trade-mark applications in the relevant sectors

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, PolMi, CIR

Synthetic indicator: patent application in the relevant sectors + trade-mark applications in the relevant sectors



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, PolMi, CIR
© UMS RIATE for administrative boundaries

4.3 Tourism and Sustainability

The maps below present the synthetic composite indicator *Tourism and Sustainability* benchmarked in the first case along the programme area and in the second case, along ESPON space, as data availability allows. The composite indicator quantifies the development in tourism and sustainability undertaken in a given NUTS-3 region.

The synthetic indicator is composed of several sub-indicators which are individually picking up characteristics of the overall territorial dimensions in the framework of tourism and sustainability. The indicator is calculated in the following manner:

$$Sustainability = \frac{1}{3} * S_{i,t} + \frac{1}{3} * N_{i,t} + \frac{1}{3} * T_{i,t}$$

In which the variable $S_{i,t}$ represents a normalised approximation for seasonality of the individual region. Analogously, $N_{i,t}$ represents normalised area of NATURA 2000 habitats in a given region i and at time t . The variable $T_{i,t}$ represents the annual value of overnight stays in a given region i at time t . Thus, the indicator captures tourism, as well as its volatility and the general state of the environment. Each of the variables are normalised in the following manner, across the programme region and across ESPON Space. The individual values are scaled up by a factor of 100 to aid with the ease of interpretation.

$$S_{i,t} = (s_{i,t} - \min(s_{i,t})) / (\max(s_{i,t}) - \min(s_{i,t}))$$

As data sources, Eurostat and DG REGIO data is used. Seasonality is approximated via the use of a proxy variable. The variation of tourist arrivals over monthly intervals of a given year is calculated in in standard deviations and inverted. The indicator stems from Eurostat and is available in monthly intervals at national level¹⁰. For the size of NATURA 2000 sites, the indicator *NATURA 2000 area*¹¹ is used. It measures the relative share of NATURA 2000 sites to the overall NUTS-3 region. Overnight stays are available as coverage ratios at hotels and similar businesses on NUTS-2 scale¹². This indicator is broken down to NUTS-3 scale prior to use.

The scale used in the mapping is a continuous scale; a deeper shading of the colour represents a higher value. The programme area is covered with a relatively wide range of values for the indicator. A minimum of 0.2 can be observed with corresponding maximum of 154.3. Minima are found in general across Portugal and large parts of France in comparison to the maxima observed in Spanish regions-

As the indicator *sustainability* measures both increases in tourism, as well as its detrimental impacts (via potential changes to the environment, measured by the annual seasonality of tourism and changes in NATURA 2000 sites), a higher scoring region is not necessarily a

¹⁰ tour_occ_nim

¹¹ Source: EEA, DG REGIO

¹² tour_occ_anor2

region which is attracting substantially more tourists, but may shine in other aspects (e.g. low seasonality of tourism). This can be observed in the maps below on European scale and across the programme area.

Highest values are found in Madrid as well as East-Coast of Spain and Balears. Compared to Portugal and France, Spain has particularly sizeable number of regions with high indicator values. All Spanish regions have a darker shade as visible on the map. Many French regions also have higher values. While Spanish regions have visibly more intensive shade, both Spain and France are characterized by presence of regions with wide range of values. The differences in the indicator values between Portugal, Spain and France suggest that there may be national similarities in regards to combination of the indicators of which the synthetic indicator is composed.

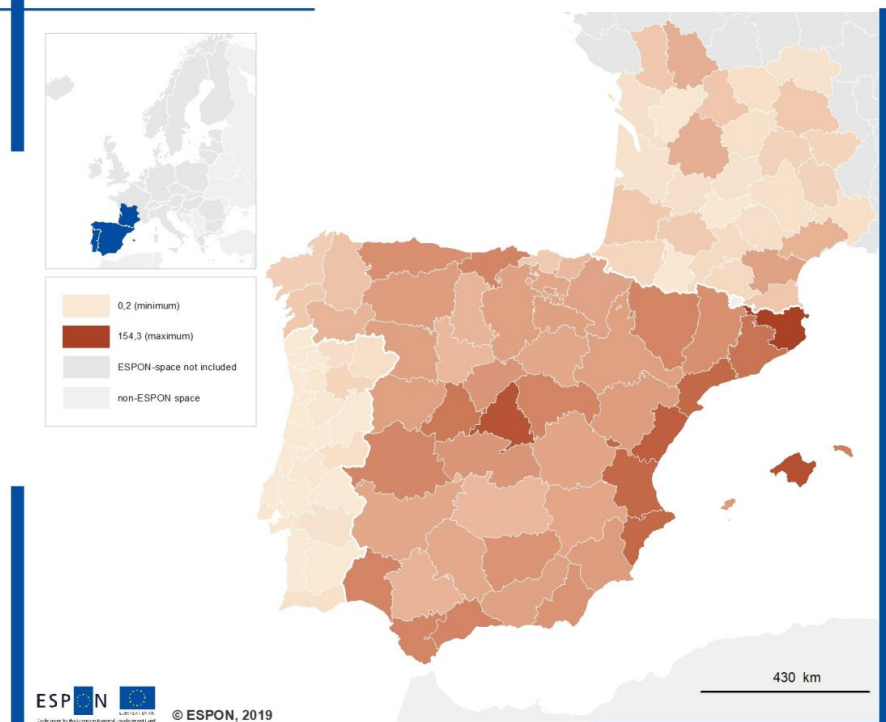
On European scale, several kinds of well performing regions can be identified: regions with predominantly low seasonality of tourism (e.g. regions within Belgium), regions with a large NATURA 2000 surface area in relation to their size (particularly Northern Sweden and Finland) and regions attracting a large degree of tourists (South-eastern Spain and Balearic Isles). Vice versa, there are also substantially many regions which may perform relatively well in one area (e.g. tourism), however, with a relatively low rating due to significant underperformance in other factors (e.g. concentrated seasonality around summer months). An example of this is Portugal. Most regions in the middle ground across Europe feature a combination of one of the factors outlined above with a relatively low rating in one of the other factors. An illustration of this phenomenon is Northern Italy, which boasts high popularity in terms of overnight stays, however, concentrated along summer months.

Spain retains its high values in the European context also against other regions with high values (Sweden, Finland, Denmark, Germany, Czech Republic, Slovakia, Hungary and Romania). In the European context, values in Portugal remain low; however colours in French regions become darker. This suggests that, except for Portugal, Spanish and French regions have high indicator values in European context.

Both in the SUDOE as well as European context, Portugal shows low indicator values which is valid in a large extent for all Portuguese regions. Except for Portugal, also some French regions have lower values of the synthetic indicator relating to tourism and sustainability in the programme context.

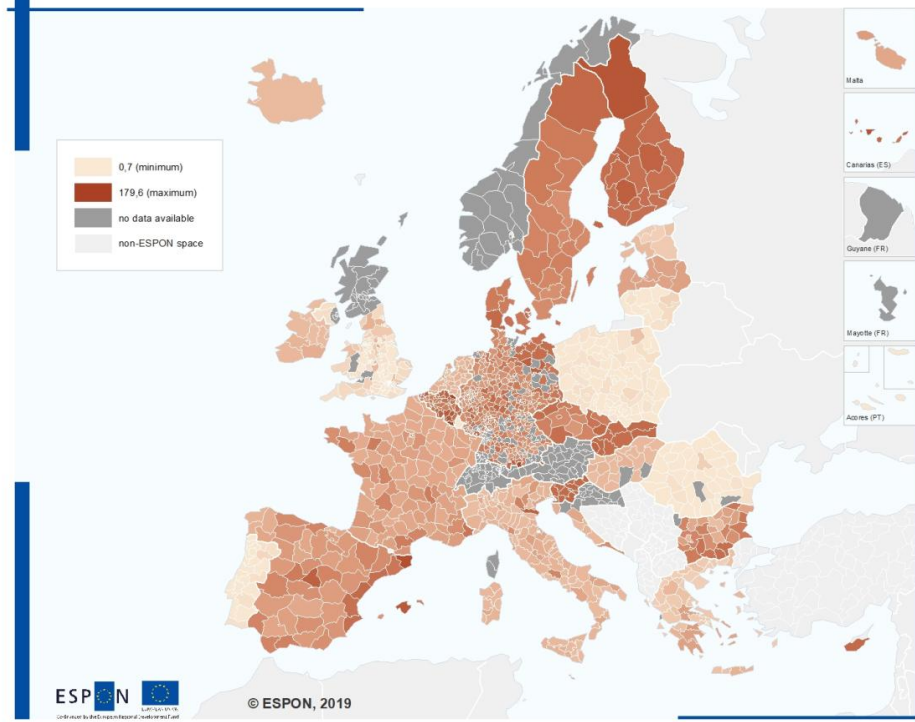
Map 4.3: Synthetic indicator: Tourism presences + seasonality + natural sites in good conditions

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions



Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, PolMI, CIR

Synthetic indicator: tourism presences + seasonality + natural sites in good conditions

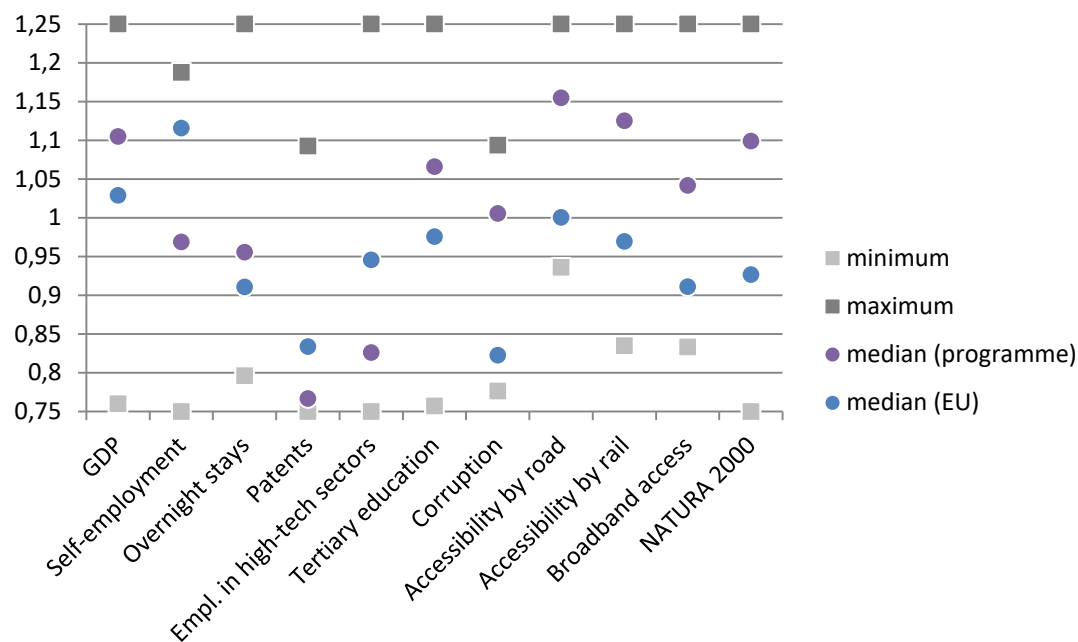


Regional level: NUTS3 (version 2013)
Source: ESPON TEVI, 2019
Origin of data: EUROSTAT, PolMI, CIR
© UMS RIATE for administrative boundaries

4.4 Regional Scoreboards

In the figure below the programme area presents a series of descriptive indicators benchmarked vis-à-vis the European context. The indicators describe a series of socio-economic, political, and geographical characteristics of the programme area, covering general economic performance (e.g. GDP), to more specific economic activities, such as innovation (e.g. employment in high-tech sectors and tourism (overnight stays), as well as infrastructure-related fields (e.g. accessibility by rail) and political perceptions (perception of corruption in local administration).

Figure 4.1: Regional Scoreboard



Source: Consortium, 2019

The indicators are normalised across the European Union (EU28). Of each indicator, the minimum and maximum value, as well as the Programme Area median and the EU28 median, is presented. A large spread between minimum and maximum value may indicate a relatively large variation of the indicator values in the programme area, indicating a large degree of heterogeneity. Conversely, a low spread may indicate a large degree of homogeneity across the programme area. A Programme Area median value above the EU28 median value indicates a relatively better performing Programme Area and vice versa.

The SUDOE Programme Area performs relatively well in NATURA 2000, accessibility, and share of population with tertiary education. A relative large range of values across the programme regions is observed across all presented indicators, indicating a large degree of heterogeneity across the programme area. This is especially pronounced in GDP, overnight stays, employment in high-tech sectors, tertiary education and NATURA 2000 sites. Smaller disparities but still significant differences are seen in case of patents, perception of corruption and accessibility by road. In some cases, the Programme Area is performing worse than EU

average, namely in self-employment, patent applications, and high-tech employment. Medians higher than EU medians are observed in cases of GDP, overnight stays, tertiary education, perception of quality of governance in respect to corruption, accessibility by road and rail, broadband access and NATURA 2000.

5 Reference Analysis

5.1 Territorial specificity of the programme area

5.1.1 Smart Growth

Table 5.1: SWOT Analysis Smart Growth

	Strengths	Weaknesses	Opportunities	Threats
Criterion 1: Technological Development & Information Society (NTIC, R&D)	<p>Increasing R&D expenditure across the SUDOE territory, in particular in the French regions</p> <p>High share of R&D researchers and scientific staff</p> <p>Excellent broadband access throughout the territory</p> <p>Relatively gender-balanced applicants for patents</p>	<p>R&D expenditures remain low in ES and PT</p> <p>Stagnating or decreasing R&D expenditures of the public sector</p> <p>Below EU average R&D expenditures stemming from the private sector</p>	<p>Importance of key sectors of high added value for the development of the territory</p> <p>Sectors driving regional growth and exports are well developed and taking more importance</p>	<p>Delays for patents review</p> <p>Share of engineers and researchers still too low (in particular in PT and ES), below EU average</p>
Criterion 2: SMEs competitiveness	<p>Relatively high and increasing start up birth rate</p>	<p>Decreasing share of R&D investments financed by SMEs</p>	<p>Dynamic business clusters composed of SMEs</p> <p>Fast growing start-ups are boosting the economy</p>	<p>The death rate of SMEs is still alarming</p> <p>Survival rate of SMEs is likewise one of the EU's lowest.</p>

The following presents additional information about the SWOT analysis of the SUDOE territory with regards to the *technological Development and Information Society (NTIC, R&D)*.

R&D expenditures in FR (SUDOE territory), have been increasing, notably in Midi-Pyrénées, which has become one of the top 5 EU regions in terms of R&D intensity¹³ (4,75% of the GDP in 2016; 4.4% in 2009).

The French SUDOE territory likewise still shows significantly higher % of *R&D researchers* compared to the rest of the SUDOE regions. As indicated in the initial SWOT, the share of *scientists and engineers* (as % of the active population), although increasing in PT, ES¹⁴, still remain under the EU average.

However, overall, *R&D investments* remain still low and are even further declining in ES¹⁵ and PT¹⁶. R&D expenditure of the public sector (government and higher education) as a % of

¹³ https://ec.europa.eu/eurostat/statistics-explained/index.php/Research_and_innovation_statistics_at_regional_level#Research_and_development_.28R.C2.A0.26.C2.A0D.29_expenditure

¹⁴ Scientists and engineers as % of active population: PT:4,8% (2012) , 7% (2017) – ES: 5,2% (2012), 6,1% (2017) – FR: 6,8% (2012), 6% (2017) <https://rio.jrc.ec.europa.eu/en/stats/scientists-and-engineers-active-population>

¹⁵ ES R&D expenditures (as % of the GDP) 2010: 1,351; 2016: 1,19

¹⁶ PT R&D expenditures (as % of the GDP) 2010: 1,532; 2016:1,27

GDP has been relatively stagnating in FR around 0,75% of the GDP from 2000 to 2016. In ES, after an increase of R&D public expenditure in 2009 and 2010, the investment have been decreasing since then¹⁷. The share of the R&D expenditure of the business sector (BERD) in the GDP is for both ES (0,64% in 2016) and PT (0,61% in 2016) largely below the EU average (1,32% in 2016)

Of note, women participation's rates in *patent applications* (in the technology field), in France and in Spain, is also quite gender-equal, respectively with 31.5% and 36% of women inventors applying for a patent¹⁸. Applying for and obtaining *patents* is critical, yet, the timespan granted for the procedural review and final decision may be an hindering factor, e.g. in PT, 30,3 months are needed from the application until the final decision is made. This timeline is reduced to 11, 2 months in Spain¹⁹ (2016 figures).

The percentage of households having access to *broadband internet* is continuously increasing throughout the SUDOE territory.

The focus towards products and sectors (Aerospace, electric machinery, chemistry, pharmacy) of *high added value* appears to be a successful strategy as it contributed to diversifying growth drivers as well as *promoting exports and attracting investments*. PT's fast-growing technology sector saw 325 million euros of new cash inflows, up from just 42 million euros in 2016. Likewise, in PT, the share of exports in the GDP reached 42% (in 2017), up from less than 30% (in 2009). In ES, *high-tech trade*²⁰ (exports), led by national high tech group also shows growing trends, from € 6,919 million (in 2013) to € 10,412 million (in 2017).

The following elaborates on the SWOT analysis of the SUDOE territory with regards to *SMEs competitiveness*.

The *birth rate of start-ups* (as a proportion of the total number of active enterprises) in PT, in 2015 reached 16%, a much high rate than FR and ES, just below 10%²¹. The French SUDOE territory has a quite high start-up birth rate (compared to the national rate), Languedoc-Roussillon and Aquitaine respectively with 10,08% and 9,93% birth rates (in 2014). *Business clusters* composed of SMEs are particularly active in the French SUDOE territories. Region Occitanie (Midi-Pyrenees & Languedoc-Roussillon) is the fourth French region having the highest numbers of SMEs members of business clusters²². The dynamism of Spanish start-

¹⁷ <https://rio.jrc.ec.europa.eu/en/stats/public-government-and-higher-education-rd-expenditure-gdp>

¹⁸ http://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2017.pdf

¹⁹ http://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2017.pdf

²⁰ Includes Aerospace, computer-office machines, Electronic telecommunications, pharmacy, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=htec_trd_group4&lang=en

²¹ [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Enterprise_birth_rates,_business_economy,_2014_-_2015_\(%25\).png#filelinks](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Enterprise_birth_rates,_business_economy,_2014_-_2015_(%25).png#filelinks)

²² http://competitivite.gouv.fr/documents/commun/Les_Poles_en_mouvement/tableaux-bord-stats-communs/2015_publies_2018/TdB_ensemble_donnees_2015.pdf

ups shall be highlighted as the so-called “gazelles” are quite prominently represented in ES. “Gazelles” are firms that have grown quickly over an extended period of time. In 2016, out of the top 10 EU regions featuring “gazelles, 4 are located in ES²³.

Nonetheless, the *economic recovery* is not completely patent for Spanish SMEs as *bankruptcy rates* (in 2015) are nearly four times as high as the pre-financial crisis ones²⁴. Similarly alarming, the death rate of companies, in 2015, was almost as high as the birth rate in ES and PT²⁵. The *resilience and sustainability* of companies on the medium term (i.e. 5 years) is likewise quite low, particularly in PT. The survival rate of companies after 5 years was of only 25% (the lowest rate compared to all EU countries). The survival rate of ES companies, after five years is about 40%, the French ones, 45%²⁶.

Along those lines, the share of *R&D performed by SMEs* (as % of GDP) has also been continuously decreasing, in particular in ES, since 2009²⁷:

5.1.2 Sustainable Growth

Table 5.2: SWOT Analysis Sustainable Growth

	Strengths	Weaknesses	Opportunities	Threats
Criteria: Environment Energy resources Water resources & risk management Climate change	Increasing surface of Natura 2000 site, particularly in the French SUDOE territory. Increasing share of renewable energy in the energy mix ES and PT are close to meet their 2020 target in terms of renewable energy production Investment in R&D for environmental protection	Slower rate of increase of Natura 2000 areas in ES and PT Reported limited good governance steering the implementation of environmental measures	Attractive and diverse landscapes, territories and biodiversity, in particular for tourism-related activities Stakeholders mobilisation on topic touching environmental protection Increasing production of renewable energy contribute to reduce greenhouse gas emissions.	Noxious impacts of a growing tourism sector on the environment Mass agricultural production (in the south of ES in particular) spreads over an increasingly large area and consumes significant amount of water Population increase is linked to urban sprawl, which constitute an additional pressure on natural spaces. Global climate change impacts are strengthened by the intensive management natural resources.

²³ European Cluster Panorama 2016

²⁴ https://www.oecd-ilibrary.org/docserver/entrepreneur_aag-2016-en.pdf?expires=1541421703&id=id&acname=guest&checksum=189BD7ABCEFB388295FA546E54EF2E94

²⁵ [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Enterprise_birth_and_death_rates,_business_economy,_2015_\(%25\).png](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Enterprise_birth_and_death_rates,_business_economy,_2015_(%25).png)

²⁶ [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:One,_three_and_five-year_survival_rates_of_enterprises,_business_economy,_2015_\(%25\).png](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:One,_three_and_five-year_survival_rates_of_enterprises,_business_economy,_2015_(%25).png)

²⁷ <https://rio.jrc.ec.europa.eu/en/stats/berd-performed-smes-gdp-and-total-berd>

This section further describes the SWOT analysis of the SUDOE territory with regards to the following issues: Environment, Energy resources, Water resources & risk management and Climate change.

The surface of terrestrial sites designated under Natura 2000 keeps increasing, particularly in FR. However, in ES, the areas covered by Natura 2000 is still increasing but at a relatively slow rate. In PT, the surface covered has been stagnating since 2015 (19,010 Km²)²⁸. Of note, PT is one of the two EU countries to dedicate 0.1% of its GDP to R&D for environmental protection²⁹.

The share of renewable energies has kept increasing in both ES and PT³⁰. PT being the 7th EU country with the highest share of energy from renewable sources and the country is about to reach its 2020 target (31.5%). The increasing share of electricity generated by renewable energies as well as the efforts (human/financial resources) focused on developing the sector, besides creating a competitive advantage, may contribute to reduce CO₂ emissions. However, the end of renewable energy feed-in tariffs (e.g. in 2013, in ES) has led to an increase of electricity price generated by renewable energies and a reduced incentive to invest in renewable energies.

Lack of good and efficient governance leading to delays and problems related to the implementation of regional hydrological plans (River Basin Management Plans) was reported by PT water utility organisations.³¹ However, in PT, large stakeholders mobilisation, in particular from the private sector but as well as by municipalities and research centres, which are undertaking significant projects and studies on climate change and water management.³²

The diversity of territories as well as *unique biodiversity* still makes of ES as the French SUDOE territory, a significant *tourism attraction*. ES, followed by FR (3rd place) are the top countries attracting non-resident tourists (in 2016)³³. The tourism sector appears to have well recovered after the financial crisis, and has diversified its offer with an increasing amount of *eco-tourism options*.

Nonetheless, *tourism, mass tourism* in some cases, also however creates a high pressure on the environment throughout the SUDOE territory. Increasing *waste generation* goes hand in hand with a booming tourism industry. Moreover, the *recycling rate* remains relatively low, in

²⁸ https://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=sdg_15_20

²⁹ https://ec.europa.eu/eurostat/statistics-explained/images/7/7b/Total_general_government_expenditure_on_environmental_protection%2C_2016_%28%25_of_GDP_%25_of_total_expenditure%29.png

³⁰ https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_31&plugin=1

³¹ <https://eureau.blogactiv.eu/2018/02/22/vulnerability-to-climate-change/>

³² <https://www.epal.pt/EPAL/en/menu/epal/r-d-projects-and-studies/adaptaclima>

³³ https://ec.europa.eu/eurostat/statistics-explained/index.php/Tourism_statistics#Bed_places_in_the_EU-28:_France_and_Spain_predominate

particular in PT (13% in 2004 and 30% in 2014) as well as in ES (31% in 2004 and 33% in 2014³⁴). French SUDOE regions' recycling of municipal waste are all slightly increasing except for Aquitaine³⁵ (data only until 2011). Besides tourism, industrial and *agricultural wastes* are a major issue with regards to *water consumption and pollution*. The agricultural sector in ES is particularly dominated by an intensive agricultural model which has led the country to become the first intra EU fruits and vegetables exporters (in value terms)³⁶.

Moreover, demographic trends along with urban sprawl have led (amongst other causes) to the destruction of extensive forest areas in ES.

A critical problem, common to all SUDOE regions is the *water resources management*. For example, ES is losing *fresh water resources* at an alarming rate, (about 20% over the last 20 years), a figure which may reach 25% by 2021³⁷.

Other more or less direct consequences of *climate change* (and human (mis)management) such as erosion, droughts, flooding, desertification..etc. are challenges faced at different extent throughout the entire SUDOE territory.

5.1.3 Inclusive Growth

Table 5.3: SWOT Analysis Inclusive Growth

	Strengths	Weaknesses	Opportunities	Threats
Criteria: Employment & labour market Education & Training	Lower youth un-employment ratio The SUDOE territory comprise 7 of the top 200 Universities in Europe	Higher rate of women unemployment Below EU average levels of public expenditures on tertiary education. "lost generations" of young people leaving ES and PT to study and work in other EU in a search for better employment perspectives	Increasing levels of educational achievement Number of measures supporting the development of entrepreneurial skills Longest life expectancy (ES) as well as across the other the SUDOE territory which create a great potential for the development of a "grey economy"	Drop-out rate from education and training remains high, the highest in the EU Low student-academic staff ratio Share of people at risk of poverty or social exclusion is relatively high in ES (8 th EU MS with the highest rate)

This section further details the analysis of the SWOT analysis presented in the table above on the issues related to *Employment & labour market as well as Education & Training*.

³⁴ <https://www.eea.europa.eu/data-and-maps/indicators/waste-recycling-1/assessment>

³⁵ <https://ec.europa.eu/eurostat/web/waste/transboundary-waste-shipments/key-waste-streams/municipal-waste>

³⁶ https://ec.europa.eu/eurostat/statistics-explained/index.php/The_fruit_and_vegetable_sector_in_the_EU_-_a_statistical_overview#Trade

³⁷ https://elpais.com/elpais/2015/12/09/planeta_futuro/1449690229_241577.html

The *youth unemployment ratio* (share of young people unemployed out of the whole active population) is significantly decreasing in PT (from 10.7% in 2015 to 8.1% in 2017) and in ES (16.8% in 2015 to 12.9% in 2017).

The *unemployment rate*, in the SUDOE territory, is particularly high in the south of Spain (Extremadura: 26.2% in 2017). In ES, Pais Vasco has the lowest unemployment rate (11.3% in 2017) and in PT, the Centro Region also has the lowest rate in the country (6.9% in 2017). In the French SUDOE regions, Limousin has the lowest unemployment rate with 6.2% in 2017. All in all, despite providing interesting information on the status of the labour market, the unemployment rate figure does not really indicate the “economic health” of a region. Indeed, while the Occitanie region has the second highest unemployment rate in France, it is also the first region in term of employment creation. Attractiveness as well as in and out migration flows shall be taken into consideration when examining unemployment figures.

Unemployment rates are generally decreasing throughout the SUDOE territory. However, *gender disparities in terms of unemployment* are quite significant. In ES notably, the male unemployment rate was 13.5% and the female, 16.5% (in September 2018)³⁸.

Relatively low levels of *public expenditures on tertiary education* relative to GDP (2014) in ES and PT (below EU average)³⁹. ES is the 2nd EU country with the highest dropout rate (18.3%) from education and training (in 2017)⁴⁰. This rate is of 12.6% in PT (in 2017). Moreover, 21.8% of males are early leavers (the highest rate in the EU). Both PT and ES have a relatively low student-academic staff ratio in tertiary education (2015)⁴¹ Nonetheless, the share of the population achieving a tertiary education degree has been increasing throughout the SUDOE regions.

5.1.4 Main Challenge and Needs

Table 5.4: SWOT Analysis Overall Challenges and Needs

	Strengths	Weaknesses	Opportunities	Threats
Smart growth	Long established specialised cluster creating competitive advantages, strong network of enterprises and collaboration between sectors.	GDP per inhabitant remain below the EU average, large regional development disparities. Economic disparities due to geographical diversity of territories	Strong network of dynamic start-ups, increase focus on innovation and high value added sectors to foster exports	Reliance on seasonal activities such as tourism. The construction sector has still not regain after the explosion of the speculative property bubble burst.

³⁸ https://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics#Youth_unemployment

³⁹ https://ec.europa.eu/eurostat/statistics-explained/index.php/Tertiary_education_statistics

⁴⁰ https://ec.europa.eu/eurostat/statistics-explained/index.php/Early_leavers_from_education_and_training#Overview

⁴¹ [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Student-academic_staff_ratios_in_tertiary_education,_2015_\(number_of_students_per_member_of_academic_staff\)_YB17.png](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Student-academic_staff_ratios_in_tertiary_education,_2015_(number_of_students_per_member_of_academic_staff)_YB17.png)

	Strengths	Weaknesses	Opportunities	Threats
Sustainable growth	Significant and sustainable shift towards renewable energies as well as research in this sector.	Public support and proactivity may be limited. A strong leadership is necessary to provide incentives for protecting the environment. Climate change and its more or less latent impacts in the territory shall not be undermined or omitted at the expense of a quest for economic growth.	Marine energy, solar energy as well as bioenergy have a tremendous potential which is being further investigated in ES and PT. A continuous investment inflow is need to pursue the endeavour.	Impact of climate change, especially on agricultural activities
Inclusive growth	Youth unemployment trends are slowing following a downward trend	School drop-out is one of the highest in the EU, additional public investment in education is required	The SUDOE area has an increasing number of population have achieved a tertiary degree.	High unemployment rate and brain drain of young educated people

Based on the previous sub-sections, the following summarises the main strengths, weaknesses, opportunities and threats affecting the SUDOE territory.

Strengths

While the financial crisis strongly hindered the economic development, thereby direly affecting the social fabric of the territory, the recent development have shown a positive recovery, notably led by dynamic start-ups. The existence of large and resilient metropolitans centres also played a key role, for example, in attracting investments and commercial activities from the international level.

The main economic sector remains the tertiary sector, which however feature development models, specific to the programme area. The agro industrial sector also largely supports the primary sector by purchasing and transforming the local production. Last but not least, tourism is a key economic driver, which slowly but surely follows more sustainable development pathways, tapping on the territory’s immense natural, cultural and artistic heritage.

Weaknesses

Regional development disparities remain prevalent between the various regions of the programme. This is notably patent when considering the various income levels across the territory. The very different population density, from sparsely populated areas to extremely densely populated zones (mostly along the littoral areas) is a persistent issue due to the effect on the environment (e.g. biodiversity loss due to pollution, need for better integrated waste management solutions).

Opportunities

The large diversity of types of territories, ranging from very rural and remote areas to metropolitan centres allows for the development of synergies and complementarities between the

rural and urban areas. Activities intending to valorise the potential of rural areas have been undertaken based on participatory principles. The key sectors with the highest development potential (aeronautic, renewable energies) are supported in order to create stable jobs that can sustain the long term economic prosperity of the local populations. Diversification within those key sectors is likewise sought in order to ensure the resilience of the economic and social fabrics.

Threats

Diversification endeavours shall be pursued, especially due to the high degree of seasonality of numerous activities in tourism and agriculture. The SUDOE territories is also particularly vulnerable, in a large number of ways, to climate change. The current practices, in particular intensive agricultural practices reinforce the negative vicious circle of vulnerability to disastrous climatic events.

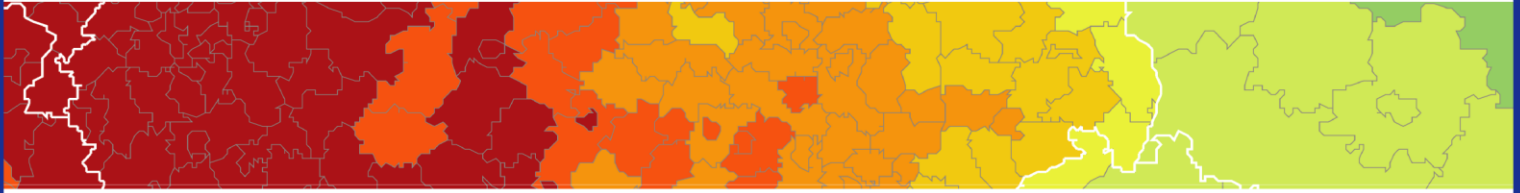
Moreover, following the economic crisis, number of young people, notably from ES and PT emigrated following a brain drain effect. If this generation is to settle abroad, financing of retirement schemes will be more challenging than ever. Recent in-migration may result in challenging situation (management of social security, administrative issues..etc.).

References

EUROPEAN TERRITORIAL COOPERATION COOPERATION PROGRAMME Interreg VB SOUTH-WEST EUROPE (2017). Interreg V-B EUROPE DU SUD-OUEST.

Evaluación Ex Ante y de la Evaluación Estratégica Ambiental del Programa de Cooperación Territorial del Espacio Sudoeste Europeo para el período de programación 2014-2020 (2015). Interreg V-B EUROPE DU SUD-OUEST.

RAPPORT DE MISE EN OEUVRE POUR L'OBJECTIF «COOPÉRATION TERRITORIALE EUROPÉENNE» (2017). Interreg V-B EUROPE DU SUD-OUEST. Version 2016.0



ESPON 2020 – More information

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.