ETMS - Interim Report

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Project 2013/3/4

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This report presents a more detailed overview of the analytical approach to be applied by the ESPON ETMS project. This Applied Research Project is conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

Information on the ESPON Programme and 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 basic report exists only in an electronic version.

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1 Presentation

This Interim Report is submitted four months after the submission of the Inception Report (in February 2013) and presents a more detailed overview on the research approach to be applied, the methodology and hypothesis for further investigation, and the presentation of initial and/or preliminary results.

The information provided by this Interim Report includes the elements discussed with ESPON CU both during the 1st TPG meeting in Barcelona and the meeting o ESPON Tools in Paris, both held in May 2013.

1.1 ETMS Transnational Project Group (TPG)

The TPG includes 5 European applied research institutions from 4 different countries: 2 universities, 1 multinational research institute, and 2 private companies specialised developing spatial planning support systems; all of these institutions have experience developing monitoring systems at European, national and regional levels, and some of them have their own monitoring systems and disseminate their activities regularly across Europe. Partners all together are experts in the different scientific and policy fields concerned. They are also familiar with different territorial contexts which brought all together cover to a large extend the ESPON space. ETMS partners have had important roles in all ESPON projects closely related to ETMS and therefore have an in-depth understanding of them.

The TPG for the ESPON project ETMS consists of the following 5 Project Partners:

- MCRIT LTD, Barcelona, Spain (Lead Partner, LP)
- Universitat Autònoma de Barcelona (UAB), Barcelona, Spain (PP2)
- Université de Genève (UNIGE), Geneva, Switzerland (PP3)
- Nordregio - Nordic Centre for Spatial Development, Stockholm, Sweden (PP4)
- Gisat, Praha, Czech Republic (PP5)

Additionally, Spatial Foresight contributes to the project as a subcontractor of the University of Genève.

1.2 Contents of the Interim Report

The content of this Interim Report is aimed at providing detailed proposal of the conceptualisation of the project. Mostly at this stage, the TPG presents a first formal proposal of the system of indicators to be used at the base of the ETMS, based on the analysis of relevant policy discussions and previous monitoring works in ESPON and outside, and preliminary proposals on how the TPG plans to present these indicators. This mostly concerns the temporal scope and territorial scale of indicators, the envisaged web tools and web contents, and preliminary guidelines on the nature of expected direct outputs of the ETMS such as the Monitoring Report and the Facts&Figures booklet. This report also proposes methodology and guidelines for data gathering and data documentation.

From the Annex III of the project proposal, this Interim Report includes the following materials:

- Draft version of the conceptualisation of a practical and operational European Territorial Monitoring and Reporting System (selection of key policy indicators) directly linked to the outputs of the INTERCO project, to the ESPON 2013 Database and to the ESPON SIESTA Project.
- Outline of use of existing ESPON tools as components in the ETMS
- Screening and overview on different options for building up the application and IT solutions for the ETMS communication.
- Short reporting of the activities, both planned and realised, resolution of problems and definition of delimitations.
- Work plan until the Draft Final Report.

1.3 Completed activities up to this Interim Report (June 2013)

The following table synthesises the most relevant actions taken by the TPG since the beginning of the ETMS project until the delivery of this Interim Report.

Task	Activity
WP1 Management	- Kick-off meeting in Cyprus ESPON Internal Seminar, TPG meeting (with participation of ESPON CU project expert) in Barcelona, and Skype conferences for internal communication - Subsidy contract and Partnership Agreement signed by LP and ESPON CU, and LP and TPG respectively - Inception Report and Interim Report delivered on time by deadline given in the subsidy contract - Creation of the project website for internal coordination and external communication (http://80.33.141.76/etms/)
Task 2.1 COMPASS Indicators	- 1st proposal of a key set of Monitoring indicators based on the analysis of key policy documents and ESPON projects (e.g. INTERCO and SIESTA) - Orientations on the nature of Monitoring Report and F&F Report, based on benchmarking existing examples.
Task 2.2 Application Design	- Repository of Monitoring references (Monitoring Systems, Monitoring Reports, F&F booklets, rankings, expert opinions) published in the website - Benchmark analysis of existing references and tools in Europe and the World. Review and analysis of functionalities of ESPON Tools. - Proposals for ETMS website platform organisation and contents discussed among partnership (mockup prototypes available at http://80.33.141.76/etms-project/) - Orientations of the ETMS Data Analysis and Mapping tool discussed in the ESPON Tools Workshop in Paris (May 2013)

Table 1. Activities Carried out until Interim Report

1.4 Work towards Draft Final Report

The TPG plans, after the delivery of this Interim Report to meet early in fall 2013 to finalise the discussion on the conceptualisation of the ETMS and establish the final guidelines for the

development of the ETMS system, the web platform and the 2 prototype reports. This will be a chance also to obtain feed-back from the ESPON CU and the Sounding Board.

With all these on board, the TPG plans an intermediate delivery of materials in November 2013, including a prototype of the ETMS web platform and its monitoring outputs (Monitoring Report and F&F Booklet). More specifically, this intermediate delivery will include the following items.

- Final proposal of a European Territorial Monitoring System.
- Draft version of the first “European Territorial Monitoring Report”.
- Draft version of the booklet on “Territorial Key Facts and Figures” on the main territorial dynamics of the European territory, its regions and cities.
- Draft version and presentation of the application.

After November 2013, the TPG will then intensify the work on data gathering, database implementation and development of the ETMS website platform and website tools themselves. The objective is to advance towards the delivery of the Draft Final Report, envisaged towards June 2014. The Draft Final report will include the following elements:

- Draft documentation of all aspects of the project implementation
- Final version of the first European Territorial Monitoring Report
- Final version of the booklet on “Territorial Key Facts and Figures” on the main territorial dynamics of the European territory, its regions and cities.
- Final version of the application

A detailed planning of all project activities and deliveries is presented in the last chapter of this Interim Report.

2 Conceptualisation

2.1 Aim

The Project Specifications describes the objective as providing "a continuous monitoring of territorial trends and structures able to provide policy relevant information to target groups on key trends occurring for European regions, specific type of territories, metropolitan regions, cities and towns in relation to the policy aims and priorities of the Europe 2020 Strategy, EU Cohesion Policy and the TA 2020".

ETMS will cover the entire ESPON space, and will be capable of continuous interpretation, assessment and communication of territorial development trends in relation to policy objectives related to Territorial Cohesion (in particular the EUROPE 2020 Strategy and the Territorial Agenda 2020). The work is to be understood as a practical and statistical exercise that should lead to an operational Monitoring System at European level for policy makers and policy analysts.

In order to be valuable, the ETMS needs to find a trade-off between monitoring the territorial dimension of trends and monitoring objectives and themes emerging from the current policy debate. ETMS will develop a system monitoring the most important development trends for different types of regions, cities and territories in link with the objective set out in the policy debate and especially the EU2020 Strategy and the Common Strategic Framework.

In the Barca Report, the idea of 'place-based' development strategies was brought at the fore of the territorial policy debate. Furthermore, the debate on *geographic specificity* has reinforced this understanding that territorial development is strongly affected by geographical characteristics. Based on this core idea, a territorial monitoring system needs to be conceived as a platform able to put development trends in the perspective of specific territorial structures. Different types of regions, cities and territories will have different *development trajectories*, as they are faced with different challenges and may enjoy different assets and opportunities.

2.2 Approach

Departing from the analysis of key policy concepts and priorities, based on the critical reading of official policy documents and past ESPON projects, a limited number of indicators is proposed to streamline the monitoring of most relevant trends in Europe in relation to today's basic territorial uncertainties, the so-called COMPASS Indicators.

COMPASS Indicators cover the following basic dimensions:

- Economic competitiveness (innovative, effective, resilient and open economies)
- Human capital (people on move, ageing society, skills and education)
- Social inclusion (creating new jobs for all, living Standards / territorial attractivity, promoting social and spatial inclusion, efficient modes of service provision)
- Environmental sustainability (energy efficiency, managing environmental quality, land and resource potentials)
- Connectedness (functional integration and accessibility, denser cooperation patterns, completing the digital infrastructure)

Once the set of COMPASS Indicators is defined, the ETMS will produce monitoring products aimed at showing the temporal evolutions of these indicators in the different territorial dimensions,

allowing efficient and user-friendly monitoring analysis. The basic products envisaged by the ETMS are the following:

- an ETMS statistical database, available for user to download
- an interactive Data Analysis Tool, to explore data graphically online
- a Facts&Figures booklet, published periodically (once or twice yearly)
- a full Monitoring Report, providing in-depth analysis of territorial evolutions (published annually or biannually)

All these products will be integrated in an online web platform, the ETMS Portal website.

It may also be considered incorporating complementary materials already being produced by the ESPON network or by third parties, allowing for a more nuanced interpretation of monitoring activities specifically provided by the ETMS itself. Examples of such complementary elements may be a Virtual Library of monitoring resources, the ESPON Map of the Month activity developed by ESPON, Policy Conclusions by other ESPON projects, or links to relevant opinion makers.

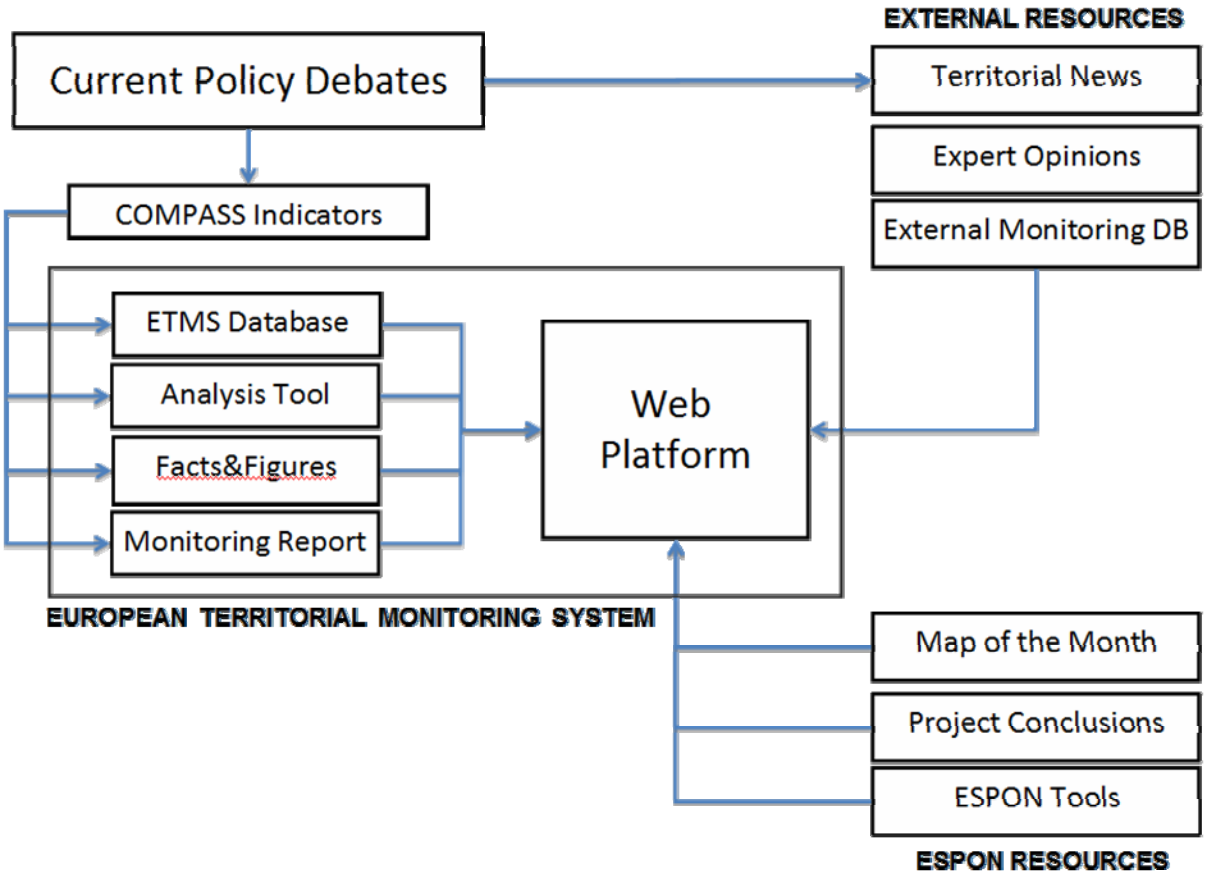

Figure 1. ETMS General Organisation

2.3 From policy aims and priorities to COMPASS Indicators

The main aim of ETMS is to provide a framework for a scientifically sound and policy relevant monitoring of key territorial development trends and structures in Europe.

The list of policy issues to be monitored for each type of regions, cities and territories emerges in ETMS from the review of key European policy documents, in line with the specific requirements made by the ESPON CU in the Inception Report (CSF, Territorial Agenda 2020, or the Green Paper on Cohesion, Cohesion reports, Europe 2020...). Other documents providing pertinent insights on territorial development issues, such as the Barca report or the Report for the Polish Presidency are used as complementary sources of information.

Some of the key identified questions considered relevant for territorial monitoring are as follows:

- How efficiently do territories perform in economic terms?
- Is economic convergence of regions progressing in Europe?
- What is the knowledge capital of European territories?
- How diversified are their territorial labour-markets?
- How do job opportunities vary across Europe?
- How inclusive are the territorial labour markets?
- Which territories are most dynamic in demographic terms?
- How heavily will the territories be impacted by ageing of population?
- What is the skill level of population?
- How well-off are their residents?
- How environmentally-friendly are energy consumption patterns?
- What is the quality of the living environment?
- What are the land resource potentials?
- How accessible are the European territories?
- What is the quality of digital infrastructure and services across Europe?
- How intensively do territories cooperate?

The review of ESPON literature enables to identify how different territorial development issues have been quantified and measured by different ESPON projects. Through a critical assessment of policy documents, ESPON projects and existing databases, the ETMS-team has select a set of COMPASS Indicators that provide the best trade-off between policy relevance and scientific soundness for the monitoring system.

The indicators selected, presented and discussed in the next chapter, have considered the conceptual framework developed in the INTERCO project and the SIESTA project, and their corresponding lists of indicators. In addition, cooperation channels have been established and are expected to be further strengthened with the M4D project (for dealing with indicators provided for extended time series, for analysing regional desegregation techniques used in the Olap Cube), and the BSR-TeMo and City Bench projects (to share experiences on monitoring indicators at different scales). Results of other ESPON projects such as KIT in relation to typologies of innovative regions in Europe, DEMIFER and other are also considered as they can provide a contextualisation of the European regions.

2.4 Scope and Territorial Scales

The basic framework for 'monitoring' the policy debate and aims on European territorial development is created in the ETMS by combining types of regions, cities and territories (e.g.

rural, metropolitan, mountain, sparsely populated regions…) to specific policy issues (e.g. economic competitiveness, social inclusion, environmental sustainability…). A set of 'territorial entry-points' is proposed as way for the users to enter the monitoring system.

In addition to the territorial entry points the ETMS will considers time and theme as entry points as well. It will be therefore a European monitoring system based on 3 Ts: territory, time and theme. The back bone of the system will cover in a systematic way the entire ESPON space, European neighbourhood or the world scale in a selected number of topics such as globalisation, competitiveness.

The following orientations are provided as orientations for the design of the ETMS:

- For each territorial entry point, it is possible to identify a set of policy issues that is characteristic to its territorial development potentials and challenges. This is what the TPG calls the territorial storyline;
- The monitoring of the development trajectory for each territorial entry point is achieved by measuring actual trends related to its specific territorial storyline;
- Some policy issues may be relevant to several territorial entry points, but their actual measurement and monitoring may differ due to the differences in the definition, delineation and delimitation of each type of territory;
- Policy issues may be monitored by using statistical and empirical information resulting from the combination of several indicators;
- Each indicator is based on the statistical combination and calculation using more or less extended datasets to be compiled.

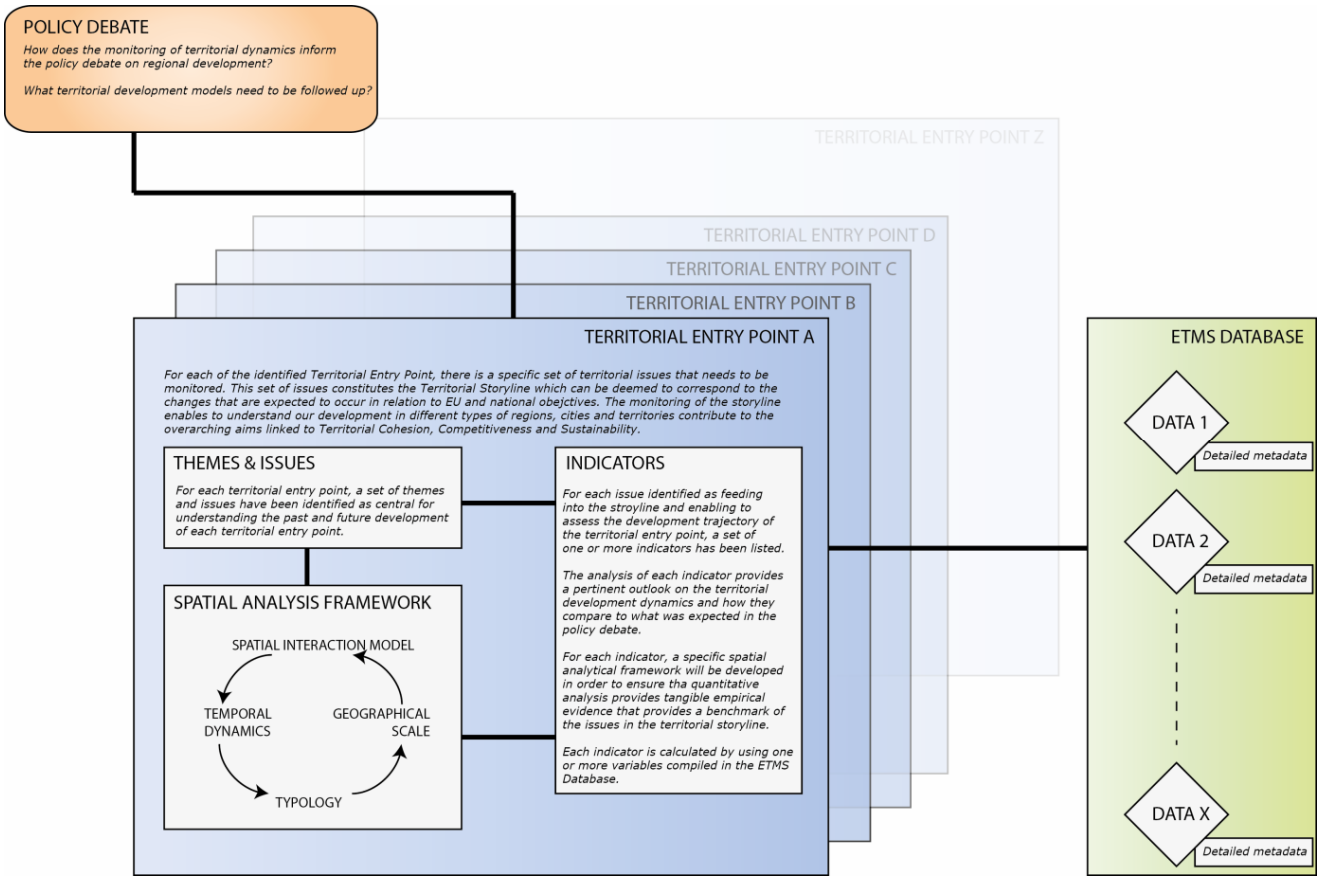

Figure 2. General model for the ETMS

The concept of Territorial Entry-points is aimed at providing an answer to the evident need to monitor the development trajectory of territories in relation to both EU policy objectives and their territorial specificities. Territorial Entry-points are used as a way into the policy debate, enabling to the fore both the territorial and policy dimensions of the monitored trends and issues. Regions, Cities, Territories and Macro-regions are proposed as basic Territorial Entry-points. For each Territorial Entry-point, it has been scanned the most relevant policy debates and identified the key territorial development issues that need to be assessed in order to be able to monitor their respective development trajectory.

- Regions *(e.g. Structural Funds Regions, Rural Regions, Border Regions)*
- Cities *(e.g. Metropolitan regions, Core cities, Larger Urban Zones)*
- Territories *(e.g. Mountain areas, Islands, Sparsely populated areas, Coastal areas, Ultra-peripheral regions)*
- Macro-regions (e.g. Baltic Sea Region, Danube Region)

2.5 Data Procurement

The following data sources are being considered at this early stage of the project to provide contents to the ESPON ETMS:

a. Using ESPON DB datasets (e.g. GDP, Population), at NUTS0, NUTS2 or NUTS3 for reference and framework indicators. ESPON Database will be assessed to identify not just interesting indicators but mostly methods to compute indicators that can be replicated in the frame of a continuous monitoring process

b. EUROSTAT datasets at NUTS0, NUTS2 or NUTS3 for reference indicators when these are not available via ESPON DB. Using other international sources (e.g. EEA, OCDE...) when information is at regional level or bellow, and creating added value because of a deeper policy analysis

c. Pan-European datasets at regional level by assembling and harmonising datasets from Statistical and/or Regional Institutes with the help of ESPON DataNavigator, below NUTS3

d. ESPON forecasts for 2020 and 2030 developed by forecast models, can be integrated if there is a way to update the forecasts (and discuss the differences) annually (in collaboration with other ESPON projects providing forecasts, e.g. ESPON ET2050)

2.6 Basic Monitoring Products

The main envisaged outputs of the ETMS project are the following:

- The ETMS database, containing temporal series for all COMPASS Indicators, available for data analysis and free to be downloaded by users
- The ETMS Data Analysis tool, which will be a tool to retrieve, map and produce brief reports. This tool will be developed to maximise its usefulness for the specific needs of ETMS. In addition to maps, the tool will provide graphs or animated pictures showing development trends. Functionalities such as export, save as, download, zoom, selection by certain attributes or criteria (eg all regions with GDP per capita above average in the last 5 years, regions including a city with more than XXX inhabitants), benchmarking and

comparisons based on a selected number of indicators should be integrated in the system.

- The Facts&Figures brochure, intended to be feasible to be produced every 6 or 12 months. May cover different issues in each release (since no data update is feasible in 6th months). The first issue could be focused on key territorial development indicators (first draft to be provided for the November 2013 delivery). The contents will mostly be policy relevant graphics and maps, with a short description and explanation of what is illustrated in the light of current policy aims related to TC.

- The Monitoring Report will be issued annually or biannually. Will contain in-depth analysis of the policy questions being monitored. Different relevant experts will contribute to it. No more than 50 pages, in total.

All these products will be integrated in an online web platform. The on-line user interface will be as simple and easy to maintain as possible aimed at policy makers and practitioners at various geographical levels, with options for user interaction, including if relevant a discussion forum for the meaning and interpretation of the indicators being included in the monitoring system. A first proposal of the nature of this web platform interface is presented in this Interim Report.

The ETMS website shall not be a duplication of the ESPON website and should not integrate information already available in the ESPON website. It shall, however, maintain the ESPON standards for web publications, gathered in the ESPON Style Handbook. Strong coordination with mapping tools facilities under development are necessary in order to ensure usefulness, avoid double work. When developing and proposing visualisation solutions, monitoring should be a key concept to be considered and some use cases (as questions and potentials users) should be defined in order to check if the outputs are in line with user's needs. The overall platform should be mainly policy drives.

2.7 Complementary Products

The ETMS shall make use of other tools and communication channels to provide complementary information relative to monitoring. This use, made possible via links in the ETMS website platform, could contribute to a more rich monitoring process in parallel to the COMPASS Indicators analysis and database.

A few ideas are provide below, and will be developed in case their added value is perceived as relevant, always in dialogue with the ESPON CU.

Among these functionalities, it can be stated the following:

- *The map of the month* can be an initiative to be supported and further promoted by the ETMS system, including the possibility to organise expert discussions around each month's published map. Dialogues could eventually get started by key stakeholders or relevant experts. Another possibility would be to promote annual survey on perceptions concerning the strategic policy questions to permanent panels of experts.

- *Policy Briefs by ESPON projects*. After delivery of Final Reports by ESPON projects, a number of policy briefs could be drawn and included in the ETMS to contribute qualitatively to the monitoring of relevant territorial issues, in complement to the ETMS database of COMPASS Indicators

- *Making use of ESPON Tools*. A number of ESPON tools can be very useful to complement the ETMS database. ESPON Rimap can be used to navigate data of the

ESPON Database in a graphical interface. ESPON MapFinder can be used to navigate maps by ESPON projects

- *Virtual Library of Monitoring Resources.* Already built as a prototype, the ETMS website displays today a wide range of reference monitoring materials. The full database of monitoring products gathered up to now (more than 350 references, from around 100 global, European and regional institutions) allows browsing resources by monitoring products or by providing institutions. For each resource, basic information and link to the original document is provided.

- *Monitoring territorial news* in European mass media (e.g. following the "Anuari de Territori" of SCOT). Based on blogging technologies it is today easy to edit "thematic magazines" based on the publication of third party news (e.g. "Scoop.it" technology). The challenge would be to identify relevant territorial news on a permanent basis, and to publish a selection of these news on a ETMS Press Dossier.

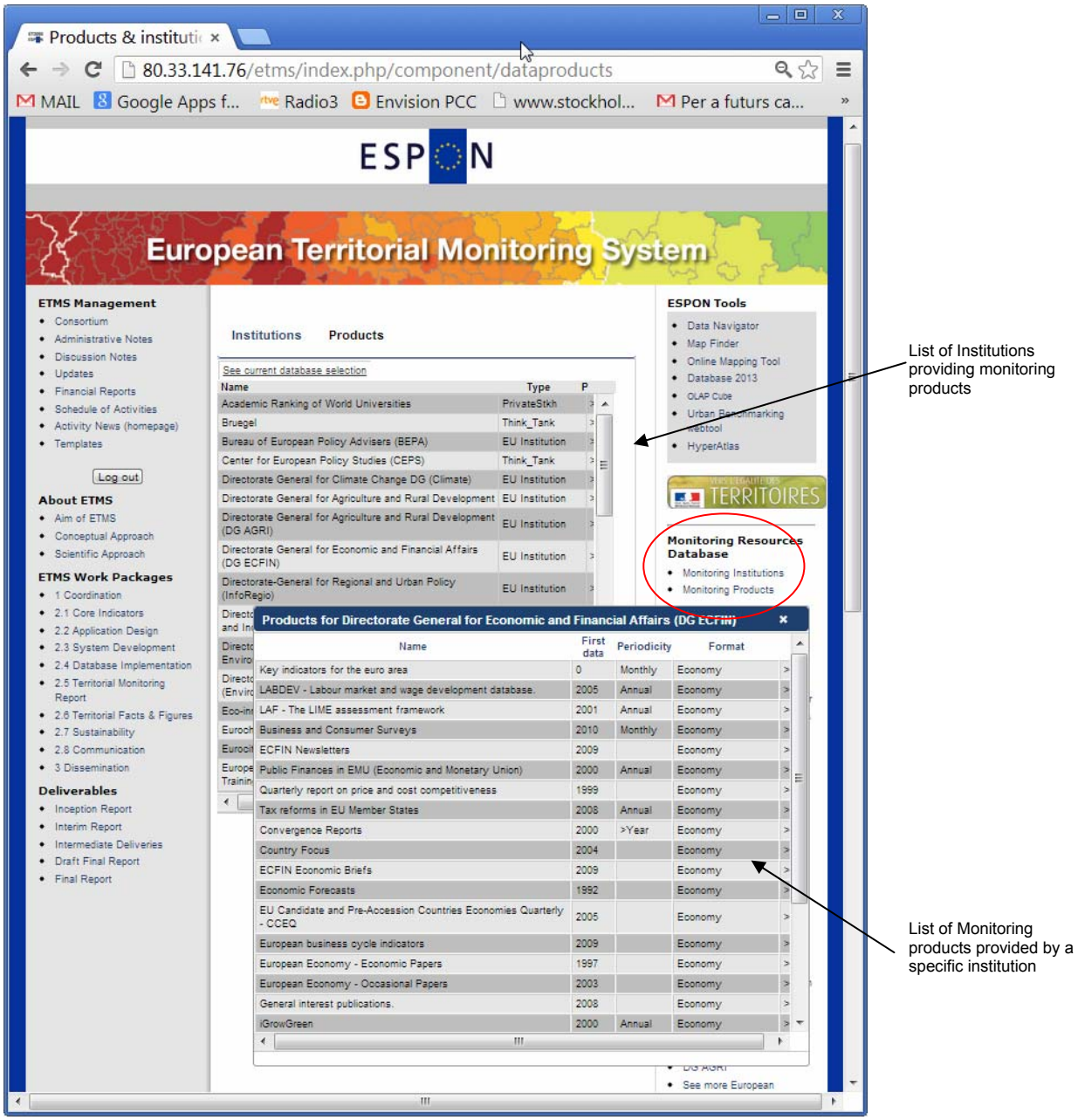

Figure 3. Prototype Virtual Library of Monitoring Resources

2.8 ETMS Sustainability and Documentation

The sustainability and maintenance reference report will be developed as a very practical guide to facilitate the work of the ETMS manager. It will include directories and contacts to data providers, and operational procedures to contact providers at due time, obtain or generate the raw data, develop and represent the indicators, produce the policy analysis, publish and disseminate results to a directory of users.

Metadata documentation, based on ESPON DB, is mandatory for any indicator to be included in the ETMS. For prospective databases, forecasts models will be documented following SPQR or similar form. The metadata model developed by M4D (fully INSPIRE compliant) will be considered in the ETMS.

3 From policy debates and aims to territorial indicators

3.1 Proposal for COMPASS indicators

3.1.1 Approach

The indicators that need to be collected for the ETMS are called COMPASS indicators because their monitoring can be considered as the compass necessary to orientate the policymakers and stakeholders towards future territorial development policies. These indicators need to provide an easy-to-understand, scientifically sound and policy-embedded assessment of development trajectories of different types of regions, cities and territories in Europe.

In our understanding, the selected COMPASS indicators need to fulfil the following criteria:

1. They should express fundamental 'values' of European territorial development as emerging from the European policy documents, and especially the most strategic (EU2020 Strategy) and operational (CSF) ones.

2. They should preferably be available (and compiled) at different geographical scales: NUTS 0, NUTS 2/3 and LAU1/2.

3. They should preferably be collected in time series. The interval between the years collected may vary with the geographical level, but data should be available transversally, i.e. with data for NUTS0-NUTS2/3-LAU1/2 for the same year, but should be made available with regular updates.

An evident starting point is that all indicators must be a part of a time series in order to be monitored. Whenever possible *at least two datasets* per variable need be included into ETMS. In principle we aim to include *at least the latest available data* and *another one that shows the development trend during last 5 to 10 years*. Other datasets between those dates may be compiled depending on their availability on a pan-European dimension. The indicator specific timeframes and updating possibilities will be included to ETMS when the final list of indicators is set. Parts of the COMPASS indicators and variables behind indicators can be collected and/or updated in the lifetime of the ETMS project, but the regular collection of these variables should be undertaken as a long-term engagement for building a continuous Territorial Monitoring System.

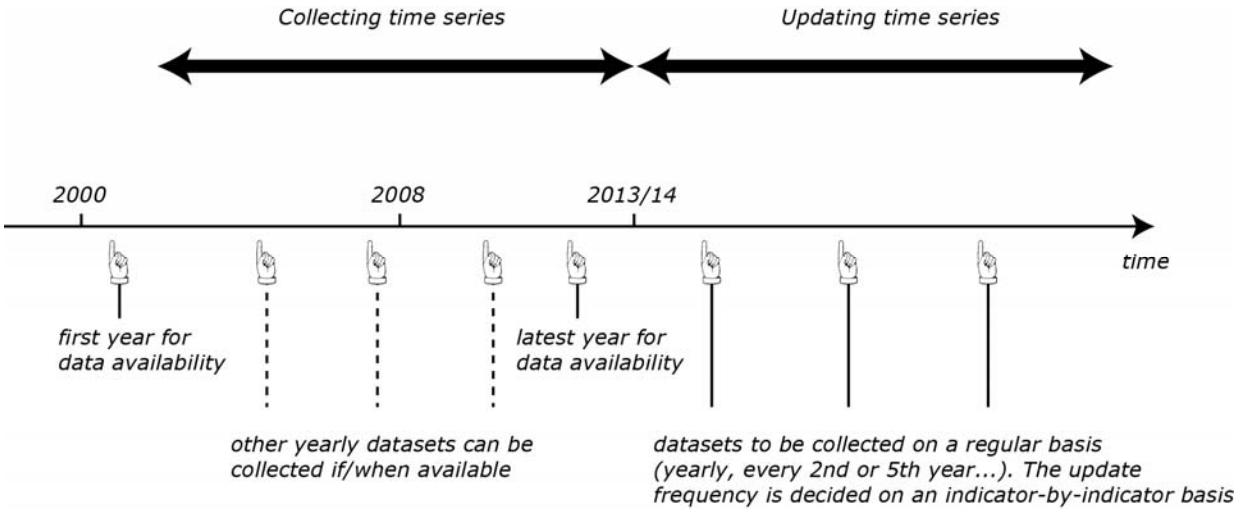

Figure 4. Data collection timeframe

Due to different nature of different COMPASS indicators, there are – in principle – three main temporal types of indicators

1. Basic indicators with frequent updates and good data availability - like GDP, total population, employment…- can be included with annual datasets on NUTS3/2 levels. At this step of the ETMS we will focus on data from 2005 to latest available. Annual updates are crucial especially for 'sensible' indicators, like unemployment rate, were annual variations can be remarkable

2. Contextual Monitoring Indicators. Time frame and updating possibilities for some indicators are 'ready set' after the data publisher. E.g. changes in land cover will be based on the CORINE land cover datasets 2000 and 2006. These indicators are anyhow rather stable/slowly changing and showing changes for less than 5 years would thus not really have any adding value.

3. A number of structural indicators are included into COMPASS indicators. These indicators are based either on LAU1/2 or grid level data. Due to project capacity the TPG can only provide a 'static' picture of Europe with regards to these variables. We have anyhow included these indicators into a "wish list" for indicators that should be updated if a policy relevant territorial monitoring system is aimed to be operational later. Also, as the local level data is available only from censuses for a remarkable number of countries, updates are thus available app. only every ten years.

3.1.2 Proposal for COMPASS indicators

Next, the proposal of the ETMS COMPASS Indicators is presented. The full COMPASS indicator table is attached to this Interim Report as an Annex on Excel format, including details on the territorial scale and scope envisaged for each indicator, and the potential data sources to be used for its determination.

ECONOMIC COMPETITIVENESS	
What is the knowledge capital of the territories?	Total R&D expenditure as % of GDP
Is economic convergence progressing in Europe?	GDP per capita in PPS, in relation to EU average
How efficiently do territories perform?	GDP-PPS per person employed
How diversified are the territorial labour-markets?	Employment per sector
How does the labour market size vary across Europe?	Jobs potential within commuting distance

HUMAN CAPITAL	
How is population distributed across Europe?	Population potential within 45 min
How rapid is the population increase / decline?	Net migration rate Total population change Birth rate
How heavily will the territories be impacted by ageing of population?	Old age dependency ratio
What is the skill level of population?	Persons aged 30-34 with tertiary education attainment

SOCIAL INCLUSION	
How dynamic and inclusive are the territorial labour markets?	Employment rate 20-64 years Total employment rate Difference between female and male employment rates Unemployment rate Young unemployment rate
How well-off are their residents ?	Disposable household income At-risk-of-poverty rate

ENVIRONMENTAL SUSTAINABILITY	
How environmentally-friendly are engery consumption patterns?	Share of Renewable Energy in Final Energy Consumption
What is the quality of the living environment?	Air pollution: PM10 Degree of soil sealing
What are the land resource potentials?	Land use pattern*

CONNECTEDNESS	
How accessible are the territories?	Access to MUAs Access to Airports Accessibility to Ports
To what extent have the territories access to digital infrastructure and services?	Households with broadband access
How intensively do territories cooperate?	Cooperation intensity (ETC)

Table 2. COMPASS Indicators for Territorial Monitoring

3.1.3 Complementary framing indicators

From the review of the key EU policy documents, it has become clear that most development objectives address the territorial dimension only implicitly, i.e. not actually referring to specific types of regions, cities or territories. Whereas these themes are important with regards to development policies, they remain at a higher geographical scale above the Territorial Entry-points, sometimes only available at national level. Monitoring these themes may provide valuable insights to the policymaking community for providing 'broad picture' illustrating the trends with regards national and regional development policy themes in Europe.

This thematic monitoring can be undertaken by using some indicators at the NUTS 2/3 or NUTS 0 level. Whereas the use of these statistical levels lacks in 'geographical accuracy', they do make sense in terms of policy monitoring as most EU programmes and strategies are addressed and implemented at these levels. From a statistical point of view, it enables as well to build a statistical monitoring system that provides regular updates (based on Eurostat updates). The use of such 'thematic framing indicators' is beneficial for the end user to guide his/her way into the more territorially focused monitoring system. By doing so, it enables the ETMS to provide a simple, easy-access and operational system that can be easily implemented at once and updated on a yearly basis.

It is suggested that such framing indicators may be based on a selection of indicators identified in the INTERCO and SIESTA indicators (c.f. indicators highlighted in green in the appended ANNEX table). These two projects have compiled the state-of-the-art of indicators at regional and national levels with respect to territorial cohesion and economic competitiveness. The added-value for the ETMS in choosing INTERCO and SIESTA indicators is that they have already been validated by the key stakeholders, which ensures a high level of alignment between the statistical results and policy expectations/added-value.

Besides INTERCON and SIESTA indicators, other themes may provide valuable contextual indicators for understanding territorial development trends in Europe. National indicators related to governance, the Maastricht criteria (i.e. public debt, inflation…), or macroeconomic trends may provide highly valuable *complementary* insights to the debate we aim at monitoring. It may be eventually considered that some of these contextual indicators are provided by redirecting end-users in the ETMS to the external pages of data providers (e.g. Eurostat, OECD, WB…).

On Good Governance:
http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators/theme10
http://info.worldbank.org/governance/wgi/index.asp
http://www.oecd.org/dev/usesandabusesofgovernanceindicators.htm
http://www.unhabitat.org/content.asp?typeid=19&catid=25&cid=2167

On Maastricht criteria:
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Maastricht_criteria
http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/introduction

On Macroeconomic indicators:
http://epp.eurostat.ec.europa.eu/portal/page/portal/excessive_imbalance_procedure/imbalance_scoreboard
http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:22855732~menuPK:6080253~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html

On Europe 2020 National Indicators:
http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators
http://www.oecd.org/std/oecdmaineconomicindicatorsmei.htm

3.2 Policy Relevance of COMPASS Indicators

3.2.1 The policy debate unpacked through key policy documents

In order to scan the policy debate, the TPG has reviewed a set of key policy documents. Because these documents are very different in nature, the TPG has categorized them into 4 categories.

The first category consists of the Europe 2020 Strategy alone. Clearly, all the other policy documents refer to the Europe 2020 strategy, which means that it has served as a guideline for the elaboration of other documents. In that respect, the priorities and objectives identified in all other documents are likely to be aligned with the ones set out in the Europe 2020 Strategy.

The second category consists of the two other documents that can be considered to have a focus strategic-operational focus. In this category, you find the Territorial Agenda 2020 and the Common Strategic Framework 2014-2020. These two documents are mainly designed in order to provide a more precise policy framework supporting the territorialisation of the (territorially-blind) objectives of the Europe 2020 Strategy. The Territorial Agenda provides an essential framework for understanding the fact that different regions and territories in Europe are faced in different to global challenges, that the territorial potential across varies greatly and thus that development objectives need to be territorially differentiated. The Common Strategic Framework 2014-2020 are the guidelines adopted by the EU that defines the topical and territorial orientation desirable for the allocations of Structural and Cohesion Funds in the EU.

The third category consists of three documents that can be deemed as having a territorial-analytical focus. Three central documents feed into this category: the green paper on Territorial Cohesion, the 6th progress report on cohesion and the Regions 2020 report. These documents raise the awareness of policymakers on the fact that challenges that are deemed as 'global' in fact impact European regions and territories in a differentiated way. For instance, the challenges inherent to demographic change impacts take a different form in metropolitan areas or sparsely populated regions. In return, it means that development policies aiming at compensating and alleviating the effects of these challenges need to be territorially differentiated both at the design and implementation stages. This territorial perspective is also relevant in terms of differentiated territorial potentials and assets meaning that different types of regions and territories may contribute to the overarching goals of the EU (e.g. as set out in the EU 2020 Strategy) in a differentiated way.

The fourth and final category consists of macro-regional strategies. The macro-regional strategies can be said to synthesize the perspectives developed in the previous three categories and operationalize them in a delimited territorial context. In this project, we will especially on the two pioneering macro-regional strategies: the Baltic Sea Strategy (EUSBSR) and the Danube Strategy (EUSDR). The aim of these strategies is frame the policy actions in the macro-region by operationalizing the goals of the Europe 2020 Strategy in a way that is adapted to the specific territorial conditions found within the macro-region.

Figure 5. EU policy documents reviewed in ESPON ETMS project

3.2.2 Policy Themes crossed with Territorial Entry-points

There are many ways by which these policy documents can be analysed in the context of ESPON. Many finalized and current ESPON projects have used the same documents as starting points for developing a set of indicators illustrating the policy themes addressed by the documents. To our understanding, the INTERCO and SIESTA projects have developed the set of indicators that the most relevant with regards to *policy objectives and issues*. However, the TPG argues that these indicators provide a very low added-value to the territorial development debate as these indicators are 'at best' compiled and mapped at NUTS 2 level.

In the context of a territorial monitoring system, the TPG argues that there is a need for a more accurate conceptualization of how the policy objectives and themes in these documents actually relate to specific types of regions or territories. Hence, when scanning and reviewing the policy documents, the TPG has identified the policy themes that are explicitly or implicitly mentioned for each territorial entry-point. The resulting outcome is a matrix that identifies the documents that mention or suggest the importance of a specific territory-theme combination.

In the left-side column, the TPG has listed the themes that are deemed to have a specific territorial dimension in the policy debate *as they were expressed in the actual documents*. The matrix is not an end-result in itself, but it is an important step for identifying the key development issues at stake in the policy debate in relation to each territorial entry-point. However, from the matrix, it is already possible to identify the set of territorial development issues that will need to be analysed in the ETMS in order to be able to monitor the development trajectory for each territorial entry-point. For each territorial entry-point, the specific combination of these territorial development issues creates a specific *territorial storyline*.

To give concrete examples, from the matrix, it is possible to state that the territorial storyline for mountain areas is mainly about the development of the tourism industry, the diversification of local economies and the reduction of land-use pressure. However, for metropolitan areas, it is mainly about economic competitiveness, intra-urban social exclusion, low carbon strategies and accessibility/mobility.

		REGIONS				CITIES			TERRITORIES					MACRO-REGIONS		
		Generic	ERDF-Regions	Rural Regions	Border Regions	Metropolises	Core cities	Larger Urban Zones	Mountain	Island	Sparsely	Coastal	Ultra-Peripheral	Baltic Sea	Danube	Alpine
GLOBALIZATION & COMPETITIVENESS																
	Innovation excellence		CSF													
	Close innovation divide	CSF														
	Creative class		6PR													
	Growth & Productivity	EU2020; R2020	6PR											X		
	Investment in R&D	EU2020	6PR											X	X	
	Technology diffusion	EU2020														
	Energy efficient manufacturing industries	EU2020														
	Resource-efficient primary sector			TA2020												
	Tourism	EU2020	CSF; 6PR						GP	GP					X	X
	Economic polarization	TA2020				GP	GP	GP								
	Attractive places		6PR			TA2020										
	Reducing territorial fragmentation				TA2020											
	Foster entrepreneurship (e.g. in agriculture or aquaculture)		CSF; 6PR	TA2020; CSF					CSF	CSF	TA2020	CSF				
	Access to capital for SMEs			CSF												
	Facilitate internationalisation		CSF													
	Diversification of territorial economies			CSF; DANUBE					GP	CSF; GP	GP	CSF				
	Increase of Trade volumes and business exchanges				BSR									X		
DEMOGRAPHIC CHANGE																
	Age dependency burden	R2020														
	Demographic decline	R2020		DANUBE							GP					
	Maintaining Working age population levels	R2020														
	Outmigration	R2020														
SOCIAL INCLUSION																
	Raise Employment rates	EU2020; R2020	6PR	TA2020										X		
	Self-employment for young people		CSF													
	Reduce Unemployment		6PR													
	Good living conditions			TA2020												
	Educational attainment and access	EU2020; R2020	6PR								GP					
	Poverty reduction	EU2020														
	Digital literacy	EU2020														
	Life-long learning	EU2020	6PR													
	Intra-urban Social exclusion					TA2020; GP	GP	GP								
	Service provision	GP		TA2020; GP						GP	GP					
	e-services		CSF	CSF												
	Health-care to ageing population		CSF													
	Regeneration of deprived areas			CSF		CSF; GP	CSF; GP	CSF; GP							X	
	Gender disparities		6PR													
	Inclusion of ofreing-born		6PR													
ENVIRONMENTAL SUSTAINABILITY																
	Renewable energy consumption	EU2020													X	
	Renewable energy production									CSF		CSF			X	
	Energy efficiency	EU2020	CSF												X	
	Low carbon strategies	EU2020; CSF	CSF			CSF	CSF	CSF								
	Land pollution			CSF	GP											
	Water pollution			CSF										X	X	
	Air pollution	EU2020	CSF	CSF	EU2020										X	
	Address energy bottlenecks	EU2020														
	Upgrade energy networks	EU2020; GP														
	Limit exploitation of natural resources (resource efficiency)	EU2020; CSF	CSF							TA2020; CSF		CSF				
	Maintaining good ecosytem services			TA2020					GP; DANUBE							
	Energy security and access	R2020		GP						TA2020; GP						
	Water management			CSF										X	X	
	Ecosytem resilience											CSF				
	Risk exposure, management and prevention	R2020	CSF		GP							GP; BSR			X	
	Green infrastructure		CSF	GP											X	
	Land-use and activity-related pressure (incl. erosion)								GP			R2020				
CONNECTEDNESS																
	Making Urban Mobility and commuting easier				GP	TA2020										
	Green urban transportation	R2020	CSF			CSF	CSF	CSF								
	Increase Global, European and regional accessibility	EU2020; GP	CSF	TA2020		GP	GP	GP		GP	GP		TA2020	X	X	
	Foster Cooperation, networks & clusters	GP		CSF		TA2020										
	Student & trainee mobility	EU2020														
	Broadband access (and ICT)	EU2020; GP	CSF; 6PR	CSF; GP											X	
	Enhance Labour mobility	EU2020														
	Urban-rural relations					TA2020										

Figure 6. The ETMS policy matrix: the nexus of thematic and territorial development issues

3.2.3 The 3T approach applied to Territorial Entry Points

The compilation of information in the policy matrix provides the necessary background for to linking each territorial entry points with specific policy issues. In order to make this process more systematic, the TPG has applied a 3T approach: Territory, Themes and Trends. For each territorial entry point, the combination of the 3Ts makes it possible to identify indicators (and thus data) feeding into the monitoring system.

- *Territory*: what is the geographical extent of this category? How is this category sub-divided into different spatial units? What are the statistical base-units used for monitoring?
- *Themes*: what are the priority policy objectives that need to be followed up with respect this particular territorial entry point?
- *Trends*: what is the territorial development storyline for this specific type of region or territory? What does 'development' mean for this type of region or territory? Are there territorial tensions inherent to this storyline?

A central contribution of the ETMS is the ability to put in relation observed territorial development dynamics with the territorial issues emerging from the policy debate. The statistical monitoring tool developed in the ETMS can be used to inform the policy community of the current alignment between the *expected* (i.e. from the policy debate) and *observed* (i.e. from the spatial analysis) development trajectories among each territorial entry point.

For each indicator in each territorial entry point, a specific spatial analysis framework needs to be developed. The framework correspond to the specific combination of four analytical components needed in order to ensure that the quantitative analysis of the indicator will provide valuable answer to its respective issue it is supposed to monitor:

- *Typology*: corresponds to the geographical delimitation of the spatial objects whose development is to be monitored (e.g. rural regions, mountain massifs…). Typologies can be used in order to identify sub-categories among these objects.
- *Geographical Scale*: corresponds to the lowest level of statistical units that is needed in order to link the spatial objects with the set of indicators identified.
- *Spatial Interaction Model*: corresponds to the model of benchmarking that is implemented. Indeed, territorial development trends can be benchmarked between territorial entry points (e.g. development of rural regions compared to the development of the nearest city region; the development of sparsely populated areas compared to national trends; or the development of the mountain massifs within a certain macro-region) or among territorial entry points (e.g. comparative development of all Convergence Regions; or comparative development of ultra-peripheral regions).
- *Temporal Dynamics*: corresponds to the time-frame for which monitoring is undertaken. The timeframe may be different for each indicator depending on its type and scale. Moreover, monitoring can be undertaken by assessing short-, medium- or long-term trends.

3.2.3.1 Regions

The category Regions corresponds to the administrative entities through which most of the EU Regional Policy instruments are targeted. Especially in the Commons Strategic Framework, it appears clearly that, due to the specificity of their territorial and socio-economic legacies, Convergence Regions, Rural Regions and Border Regions need to be supported in order for

them to achieve the common goals set out in the Europe 2020 Strategy and contribute to overall development across Europe.

With regards to regions, the main territorial development issue at stake is the one of convergence. The European regional policy instruments are designed in order to provide a support system for regions meant to positively impact their development trajectories. The rationale behind this is that through structural and operational investments these regions will be able to compensate for their identified disadvantage, whether it is linked to their current 'least favoured' position, their rural nature or their position at the interface between two national systems.

In return, in the territorial monitoring system, particular focus should be put on assessing and measuring the extent to which these policy regions 'perform' in relation to the specific policy objectives identified in their territorial storyline.

The 3Ts approach applied to Regions

	Territory	***Theme***	***Trends***
ERDF-Regions	NUTS 2 units in EU countries (possible extension to non-EU ESPON countries) *Convergence* regions (below 75% of EU average in GDP per capita); *Transition* regions (phasing in/out); *RCE* Regions	Growth and Productivity Employment/Unemployment Education and Skills Broadband access and usage	Convergence of the regional economies between Convergence and RCE regions Reduction of the East-West digital divide
Rural Regions	NUTS 3 level (based on a variation of the previously used OECD methodology[1]) *predominantly rural* regions; *intermediate* regions; *predominantly urban* regions	Employment structure Access to services Broadband access and usage	Diversification of the local economy, and especially away from the resource-based activities Catching up of the development of ICT infrastructure and usage in the rural areas in Europe Ensure that rural areas have a fair access to important infrastructure that are essential for the development of personal and business livelihood.
Border Regions	NUTS 3 level *Internal* EU border-region *External* EU border-region Average travel times to the coast from LAU2 units (Geospecs)	Economic development Land-use pressure Pollution (air and water) Cross-regional accessibility	Reduce territorial fragmentation Create functionally integrated border regions Preserve the environmental quality on both sides of the border

Table 3. The 3Ts approach applied to Regions

[1] The method underlying this new typology is based on a population grid of one square kilometre resolution30 and builds on a simple approach to create clusters of urban grid cells with a minimum population density of 300 inhabitants per km² and a minimum population of 5 000. All the cells outside these urban clusters are considered as rural.

It does this in a consistent manner throughout the Union by classifying NUTS 3 regions based on the share of population in rural grid cells. If more than 50% of the total population lives in rural grid cells, the region is classified as predominantly rural. Regions where between 20% and 50% of the population lives in rural grid cells are considered intermediate, while those with less than 20% in rural grid cells are predominantly urban.

3.2.3.2 Cities

Metropolitan and urban regions are often referred to in the policy debate as the 'engines of Europe', especially from an economic development angle. This means that development in those areas has potentially a strong incidence on the economic competitiveness of Europe at large, and especially from a global perspective. First of all, urban growth is through to ensure the global competitiveness of the European economies by keeping the development of economic activities with the most added-value through innovation processes. Second, urban growth is thought to benefit to their surrounding territories (hinterland) through spill-over effects and functional integration. As a general rule, development in urban regions is expected to occur through agglomeration economies and spatial clustering.

Several ESPON projects have focused on metropolitan and urban regions in the previous and current ESPON programme: ESPON 1.1.1., FOCI and TIGER. In addition, the Urban Audit provides a solid basis of statistical information and empirical evidence both at the core-city level, which corresponds to the historical, dense parts of the 'administrative' city, and the Larger Urban Zone level (LUZ), which corresponds to the commuting catchment area based on functional integration.

The territorial monitoring system needs to be able to assess and measure main urban development trends both in terms of quantitative changes (e.g. increase in urban GDP per capita, population increase) but also in terms of qualitative changes (e.g. specialization of the urban economy, extent of R&D). In addition, there are also important issues that are strongly connected to sustainable development in the wider catchment areas of cities. In the policy debate, urban development is thus also related to energy efficiency, mobility/accessibility, social exclusion and environmental quality for the living environment. Hence, the monitoring system needs to be able to provide empirical evidence on urban development in Europe, not only one the basis of economic growth, but also on trade-offs it triggers between, for instance, population increase and the quality of the living environment, land-use pressure and intra-metropolitan mobility.

The 3Ts approach applied to Cities.

	Territory	***Theme***	***Trends***
Urban Core	Morphological Urban Areas (MUAs)	Economic Growth Innovation and Smart Specialisation Global and European Accessibility Air Pollution	Enhanced specialisation of the urban economy towards high added-value and knowledge-intensive activities. Core cities continue to be the privileged living milieu of Europe's Creative Class. Yet, strong disparities exist both within nations and across Europe. Urban areas need to continue to be the innovation leaders in Europe and globally. But major disparities still exists among European cities. Gateways for internationalization of European economies necessitating high levels of European and global accessibility. The increased concentration of population and economic activities in urban areas may negatively impact the quality of the air.
Metropolitan Region	Based on the delineation of Larger Urban Zones in the Urban Audit 45 minutes PUSH areas (cf Geospecs)	Mobility Energy efficiency Access to green infrastructure Social exclusion and poverty	Green mobility pattern, i.e. trade-off between energy consumption and enhanced mobility with the city's catchment area and labour-market. A balance needs to be found between the continued growth of cities and the living environment of the urban dweller. Hence, the reduction of land-use pressure in metropolitan areas needs to accommodate more dwellers through a denser built environment and provide wider access to green infrastructure. Intra-metropolitan patterns of social exclusion usually constitute localized core-periphery structures. Development of metropolitan areas needs to tackle the reduction of pockets of social exclusion.

Table 4. The 3Ts approach applied to Cities

3.2.3.3 Territories

It is now widely understood that geographic specificity plays an important role in shaping the conditions for territorial development across Europe, not the least due to the inclusion in article 174 of the Treaty on the Functioning of the European Union (TFEU) and the Green Paper on Territorial Cohesion. In the Geospecs project, dedicated to investigating the specific challenges and opportunities of Europe's areas with geographic specificity, it was indeed acknowledged that "these key policy documents identify certain territories – cross-border, island, mountain, Outermost and sparsely populated regions – in two ways: as having particular challenges, and as having particular assets, many of benefit to Europe as a whole". This specific combination of challenges and assets for each type of territories clearly relates to the idea place-based development, as introduced in the Barca report. Hence, territorial development in these areas is shaped by this specific combination of development objectives, challenges and opportunities.

The territorial monitoring system should reflect this diversity by providing empirical evidence that makes it possible for the end-user to assess the evolution of territorial development trends related to the policy issues that are deemed as the most central for each type of territories.

The 3Ts approach applied to Territories

	Territory	*Theme*	*Trends*
Mountain areas	Mountain massifs, based on the delineation produced in the Geospecs project. Aggregation of LAU2 units.	Tourism Agriculture Regional accessibility	The tourism sector should be consolidated in mountainous local economies so that it functions as the core economic activity especially in terms of local employment. The development of the tourism sector is part of the necessary diversification of these local and regional economies. The functional integration between local economies located in lowland and highlands, between mountainous areas and the nearest urban centres, as well as among mountain massifs need to be facilitated by higher degrees of accessibility. Mountainous labour-markets tend to be imbalanced in terms of gender and age cohorts with resulting high dependency ratios.
Islands	Islands and regions and municipalities with a significant insular component, based on the delineation produced in the Geospecs project. Aggregation of LAU2 units.	Tourism European accessibility Land-use	Due to the relative physical isolation that islands are subject to, high degrees of air accessibility are central for improving the connectivity of these territories. Most island economies are strongly dependent on single economic activities such as tourism, transport or fisheries. Furthermore, public employment in administration, education and health sectors are usually higher than in other parts of Europe. The process of economic diversification needs to be based on the consolidation of these sectors combined with the development of new activities. Land-use pressure is high especially in south European islands where high population densities and high demand in tourism accommodations tend to use a high proportion of the limited available land.
Sparsely Populated Areas	Sparse Territories based on the delineation produced in the Geospecs project. Aggregation of LAU2 units with low population potential based on physical contiguity and/or territorial coherence	Demographic decline Access to services Employment structure	Depopulation has been identified as a major challenge to tackle for sparsely populated areas. These regional economies are getting smaller and need to make up for the relative growth of the nearby regional centres. Especially the asymmetric nature of this population decline leaves the regional economies of sparse territories with a structurally imbalanced labour-market in terms of gender and age. This imbalance results in high dependency ratios. The access to a skilled labour-force is a prime development issues for economic actors in sparsely populated areas. The declining importance of traditional nature-based economic activities in terms of employment in SPA increases the development

	Territory	*Theme*	*Trends*
			towards more diversified local and regional economies. Especially the development of the service sector needs to be assessed. Accessibility patterns are generally low in SPA. The improvement of local road infrastructure may improve the overall accessibility of remote actors by increasing access to structuring infrastructures such as airports, seaports that make the shipping of goods and the connectivity to markets better.
Coastal areas	Time-distance to the coastline Average travel times to the coast from LAU2 units (Geospecs)	Global accessibility Land-use Water pollution	Seaports are the prime landing points/gateways for the external connectivity of coastal regions, especially when it comes to the shipping of goods and the transit of passengers. Whereas the development of these connecting points is central to the development of coastal areas, it tends to put a high pressure on the land-use locally. A high share of the European population lives in coastal areas. In southern Europe, these areas are also highly attractive to new migrants due to the good weather conditions and high level of recreation amenities. The mitigation of increasing coastal population needs to be tackled through densification of the built environment while keeping a good access to green and marine environments and service provision. Coastal local economies are often well diversified. The specialisation of local economies into different sectors of activity may sharpen their economic competitiveness. However the specialisation in sectors such as transport, heavy industries may introduce higher potential sources of pollution. Sustainable growth is thus linked to their capacity to develop 'green' activities. Coastal areas have a high potential for the development of renewable energy production such as wind or tidal power. Tourism is a key sector to develop, but it tends to be highly demanding in infrastructure, both in terms of accommodation and transport.
Ultra-peripheral regions	Politically defined. 4 French Départements (Martinique, Guadeloupe, French Guiana and Réunion) 1 French "Collectivité" (Saint Martin) 2 Portuguese Autonomous Regions (Madeira and the Azores) Spanish Autonomous Community (Canary Islands)	Global accessibility Social exclusion Employment and Unemployment rates Skills and Education Global accessibility	A central social challenge in ultra-peripheral regions is related to the relative low educational attainment levels compared to continental Europe. At the same time, these regions have often a higher proportion of youth. Hence, the improvement of youth education is central to provide the local economies with the necessary skilled labour force for consolidating the economic base. Public administration, education and health sectors are predominant in those areas. The fact that these sectors have low development prospects, especially in the current context of crisis, increases the vulnerability of ultra-peripheral regions. Poverty is an important issue. High unemployment rates and generally lower levels of disposable incomes are symptomatic of these regions. Living conditions are often lower than in the rest of Europe (e.g. low life expectancy at birth). Accessibility by air is essential for connecting ultra-peripheral regions with the European mainland. Improving this accessibility necessitate investments in both infrastructure (i.e. airports and local access to them) and airport and transport services. Ultra-peripheral regions need to be better integrated in their direct geographical surroundings, especially through higher trade patterns with non-EU countries.

Table 5. The 3Ts approach applied to Territories

3.2.3.4 Macro-Regions

With the adoption of the EU Strategies for the Baltic Sea Region and the Danube Region, macro-regions are increasingly perceived as a relevant arena for fostering socio-economic development and reduce disparities between places. Whereas the Single Market provides a pan-European institutional framework for the integration of national and regional economies, the functional integration of these very diverse economies can be deemed to be achievable 'in patches', i.e. through the integration of transnational areas.

Using the results from the previous three categories, the monitoring of macro-regions needs to be undertaken on two main levels. First, the monitoring of disparities within the macro-region provides an important feedback to policymakers about the coherence of the objectives set out for the area. Second, the monitoring of disparities between the macro-region and the rest of Europe increases the understanding of how the macro-regions perform in the European context and how it contributes to the achievement of the overarching development goals.

The core themes that EU macro-regional strategies deem as central to follow up with respect to the development of macro-regions are:

- Prosperity: higher levels of wealth production and lower levels of poverty and social exclusion; improvement of skills and education; development of the knowledge economy.
- Connectedness: Improved internal and external transport connectivity of the macro-region; enhanced cooperation patterns.
- Environment: quality of the water; development of renewable energy production and sustainable energy use; mitigating land-use pressure from population and economic activities; air and soil pollution.

4 Five principles for dealing with data

4.1 Data and Data-sets

> *Related items of (chiefly numerical) information considered collectively, typically obtained by scientific work and used for reference, analysis, or calculation*.
>
> Source: Oxford English Dictionary

Statistical data constitute the main “raw material” on the basis of which an ETMS is built. They are the results of measures, which may have been processed by the providers, by other researchers or directly by the ETMS-team so as to improve their coherence.

All types of measurement are based on hypotheses on the objects of study. They presuppose a conceptualisation of what it measures, and methods defining how it is approached quantitatively. A simple measure such as “total population” can for example be built on a number of different definitions of “population”, e.g. persons with their effective main place of abode in a given area, persons with their legal address in a given area or persons that happen to be in an area at the time of the census. These types of issues concern all measurement in social sciences.

Secondly, the way in which the value is computed introduces a bias that may need to be taken into account. Registers will yield different results from censuses; many ”data” are calculated on the basis of surveys by using models to generalise results from a sample to the population as whole.

These issues are particular important in the context of territorial monitoring, as estimates that are scientifically valid for a large population may not be scientifically valid when considering a small local area.

In addition, an ETMS is directly or indirectly based on data compiled by different organisations, using different methods and instruments for the production of statistical data. This is particularly obvious when collecting data from national statistical institutes. Data from European bodies such as Eurostat and the European Environmental Agency (EEA) are normally processed so as to be comparable across the European territory. However, they are in many cases accompanied by information on the more limited reliability of data for some parts of Europe. In all cases, data can only be used by the ETMS if they are accompanied by precise metadata (see below).

Data mostly correspond to stocks, e.g. of population, area, quantities of goods produces, incomes, value of goods produced. A ratio is a combination of at least two datasets calculated for a specific heuristic purpose. It is therefore to be considered as an “indicator” (see below). In some cases, however, an ETMS dataset will be the result of complex calculations. This typically concerns measures of accessibility and population potential that are based on time-distances calculated with the help of a transportation network model. Even if these types of measures may be considered as indicators in their own right, connecting them to stock data would introduce an unreasonable level of complexity in the ETMS. From an organisational point of view, it therefore seems preferable to consider them as “data”.

All ETMS data are “geo-data”. The “geo” implies that the dataset has a spatial component that makes it possible associate the data with a geographical object, i.e. to georeference it. This geographical object can be an area (e.g. population in a region, local unit or grid cell), but also a line (e.g. goods crossing a border, air passengers between two cities) or a point (e.g. number of beds in a hospital, number of students in a University).

4.2 Indicators

That which serves to indicate or give a suggestion of something; an indication of

Source: Oxford English Dictionary

Distinguishing between indicators and data is important for the ETMS because the issues related to each category are quite different:

- Data are measures, and raise issues related to the method of measurement and to its processing;
- Indicators are heuristic devices, constructed to provide a picture of a pattern or trend in relation to a policy issue or debate.

Indicators are therefore combinations of data for individual geographical objects (population density, percentage of built-up area), for interconnected geographical objects (e.g. difference in income between two neighbouring regions, between an urban core area and its rural surroundings). They may also compare situations at two points in time (e.g. growth rates). Other indicators test the validity of a model, e.g. residuals of a regression analysis between two variables.

Mapping data can in some cases provide information on the organisation of a territory. Mapping the total population of regions for example shows where the greatest concentrations are located. However, the link to policy issues (e.g. exploring whether large agglomerations have better economic performances than other areas) necessarily presuppose a combination of data.

Indicators calculated at different geographic scales reflect different types of processes. Multiscalar analysis has been the specific focus of the ESPON HyperAtlas[2] and could be a source of inspiration if for the ETMS in view of combining results obtained at different scales.

4.3 Metadata

a set of data that describes and gives information about other data

Source: Oxford English Dictionary

As shown above, data can only be used by the ETMS insofar as they are accompanied by precise metadata. Elements of particular importance are the source, year/date of reference, methods of data collection and processing. Given the diversity of data sources, metadata will in many cases be associated with individual values or with groups of values rather than with a whole dataset. The data and metadata template developed by the ESPON Database project makes it possible to manage such data. This template, and the corresponding structure of metadata in the ESPON Database would therefore need to be applied to the ETMS.

Metadata associated with indicators is produced by the ETMS team itself, insofar as the indicators themselves are produced on the basis of data. However, the extent and scope of interpretations that can be made on the basis of an indicator (its “exploitability”) will depend on the quality of the data on the basis of which it has been calculated. The question of the link

[2] http://www.espon.eu/main/Menu_ToolsandMaps/ESPONHyperAtlas/

between “indicator metadata” and “data metadata” therefore needs to be addressed. In any case, indicator metadata needs to incorporate an overall assessment of background data used.

Mapping files will also be associated with metadata. The INPIRE Directive (Infrastructure for Spatial Information in the European Community)[3] contains detailed metadata regulations[4], which are based on ISO norms. From the perspective of the ETMS, apart from information on the source and genealogy of each mapping file making it possible to track how it has been constructed, data on its precision may be useful. The ETMS should in these respects follow the same approach as the ESPON Database.

Overall, metadata constitute the centrepiece in the setup of the ETMS, as they make it possible to construct coherent and comparable results over time. A starting point of the ETMS is therefore the assessment of the metadata compiled in the ESPON Database, in view of identifying datasets that may be directly transferred into it. For other datasets, one may either consider compiling missing pieces of information, or collecting the data directly from primary sources.

4.4 Statistical geographic levels

The «Spatial Levels» are defined in relation to the agreed subdivisions of the European Territory in different systems of geographic units, i.e.:

- LAU2 (about 118 000 in the EU and 121 000 in ESPON Space (EU27+4))
- LAU1 (not defined in all EU27+4 countries)
- NUTS3 (1294 units in the EU, 1353 units in the ESPON Space)
- NUTS2 (270 units in the EU, 286 units in the ESPON Space)
- NUTS1 (97 units in the EU, 101 units in the ESPON Space)
- NUTS0 (27 units in the EU, 31 units in the ESPON Space)

The different NUTS levels were initially defined in the following ways by the 1961 Brussels Conference on Regional Economies, organised by the European Commission:

- NUTS2 are “basic regions”, i.e. the framework generally used by Member States to apply their regional policies. They are therefore supposed to be “the appropriate level for analysing regional/national problems”.
- NUTS1 are “socio-economic regions grouping together basic regions”. They are meant to be used for “analysing regional problems within the EU, such as ‘the effect of the customs union and economic integration on areas at the next level down from national areas”.
- NUTS3 are “regions which are too small for complex economic analyses” and may be used for “specific analysis or to pinpoint where regional measures need to be taken”.

These considerations are still referred to by Eurostat in their publication presenting the NUTS2010 Nomenclature[5]. However, it needs to be kept in mind that they were elaborated prior to debates on territorial cohesion, at a time when metropolisation and other economic and

[3] http://inspire.jrc.ec.europa.eu/

[4] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:326:0012:0030:EN:PDF

[5] http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-11-011/EN/KS-RA-11-011-EN.PDF

demographic polarisation processes were much less advanced. Many of Europe's largest urban functional spaces extend beyond and across NUTS2 boundaries, making the assessment of economic and social processes associated with these specific and important areas difficult within this framework. Inversely, many processes of polarisation and segregation occur at a much finer scale than NUTS3.

From a more theoretical perspective, the idea according to which the level at which regional policies are applied (NUTS2) would necessarily also be the appropriate one for the analysis of issues can and should be challenged. Insofar as the objective of regional policies is not merely to organise a convergence of regional and national "performance levels" in view of facilitating further integration in the single market, but the promotion of a more cohesive, sustainable and economically and socially prosperous Europe, regional average values at NUTS1, 2 or 3 level will often provide an unsatisfactory evidence base on the challenges to be addressed.

4.5 Spatial nomenclatures

Each spatial level is associated with a set of nomenclatures, for different years. There are three "official" European nomenclatures of NUTS (2003, 2006 and 2010). Before 2003, regional delineations were made on the basis of "gentlemen's agreement" between the countries, which implies that tracking detailed changed in boundaries may be complex. The Eurostat website tracks changes from 1995[6].

NUTS delineations are only revised every three years at most, except in the case of a complete administrative reorganisation in a Member State, or in the case of very small changes leading to a change of less than 1% in the smallest region involved. All proposals for changes are formally notified the Commission by the Member States. The previous revisions have occurred in 2006 and 2010; the 2010 revision entered into force on January 1st, 2012.

By comparison, LAU units are defined nationally and are revised continuously, on the basis of national regulations. This difference between "NUTS" and "LAU" is the reason for which the spatial levels that were previously designated as "NUTS 5" and "NUTS 4" are now called "LAU-2" and "LAU1". This also implies that yearly updates of LAU boundaries are needed to map socio-economic data. The Euroboundary map of Eurogeographics has been produced between 1991 and 2012[7].

[6] http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/history_nuts

[7] The first five of these (1991, 1995, 1997, 2001 and 2004) were produced under the acronym SABE. Since 2006, yearly updates have been produced). http://www.eurogeographics.org/content/euroboundarymap

5 Data collection and database management

5.1 Basic Definitions

5.2 Challenges for an harmonised database constitution along time

Compared to other forms of territorial observation and spatial analysis, monitoring puts a particular emphasis on tracking evolution over longer or shorter time period, both by comparing current situation to past ones and by identifying the different ways in which recent trends and patterns can be drawn upon to foresee future developments. By way of consequence, dealing with challenges linked to the production of comparable and policy relevant analyses over time will be a core challenge for the ETMS.

This challenge has multiple dimensions:

- Keeping the ETMS **updated**, basing analyses on data that are recent enough to be perceived as relevant for policy stakeholders;
- Producing indicators that provide an evidence-base for current policy debates, while preserving the **coherence** of the monitoring system over time;
- Compiling data from different years that are **comparable**;
- Overcoming the challenge of **changing boundaries** of statistical units, but also of functioning urban regions and of policy-making areas;
- Using methods that can be **reproduced** by different research teams.

Producing updated data implies that the ETMS should mainly gather data directly from National Statistical Institutes and, in some cases, from Eurostat. Data compiled by other ESPON projects will generally only be available once they have been integrated in the ESPON database. Up to now, this process has taken multiple years for all projects. The ETMS would therefore need to function on the basis of direct contacts with data providers.

The frequency of data updates is quite different from country to country. Some countries may for example have yearly updates of local data based on registers, while others will only have one census per decade and produce interim estimates based on surveys and regional figures. Decisions therefore need to be made on the extent to which the ETMS should produce updated results for countries that have published new data even if this implies covering only parts of the ESPON Space.

Estimated figures between census dates or as a preliminary result of surveys furthermore tend to be adjusted at a later stage. This implies that results published on the basis of these data may later need to be revised. The ETMS therefore needs to consider to what extent the most recent data may function as a basis for its analyses.

Secondly, European policy debates are influenced by fashions and “buzz-words”, on the one hand, and by events such as the on-going financial crisis, on the other. While the ETMS should be policy-driven and seek to produce evidence that could feed into these debates, it also needs to preserve its coherence over time. This implies that the investigation of issues that may only be relevant for a limited time should not be done at the expenses of longer-term monitoring.

The compilation of comparable data is third challenge. Statistical methods evolve continuously, e.g. the way in which population is counted, the definition of Statistical economic activities are classified. Trend data will therefore in many cases be derived from estimates, based on hypotheses on how data compiled using different method can be combined.

Changes in the boundaries of administrative and statistical units further complicate the compilation of comparable data over time. This is a part of the so-called Modifiable Area Unit Problem ("MAUP") which is further discussed below.

Finally, reproducing analyses in view of comparing results produced at different times and potentially by different researchers requires that the methods are well documented, and that the background material used remains accessible to the ESPON community.

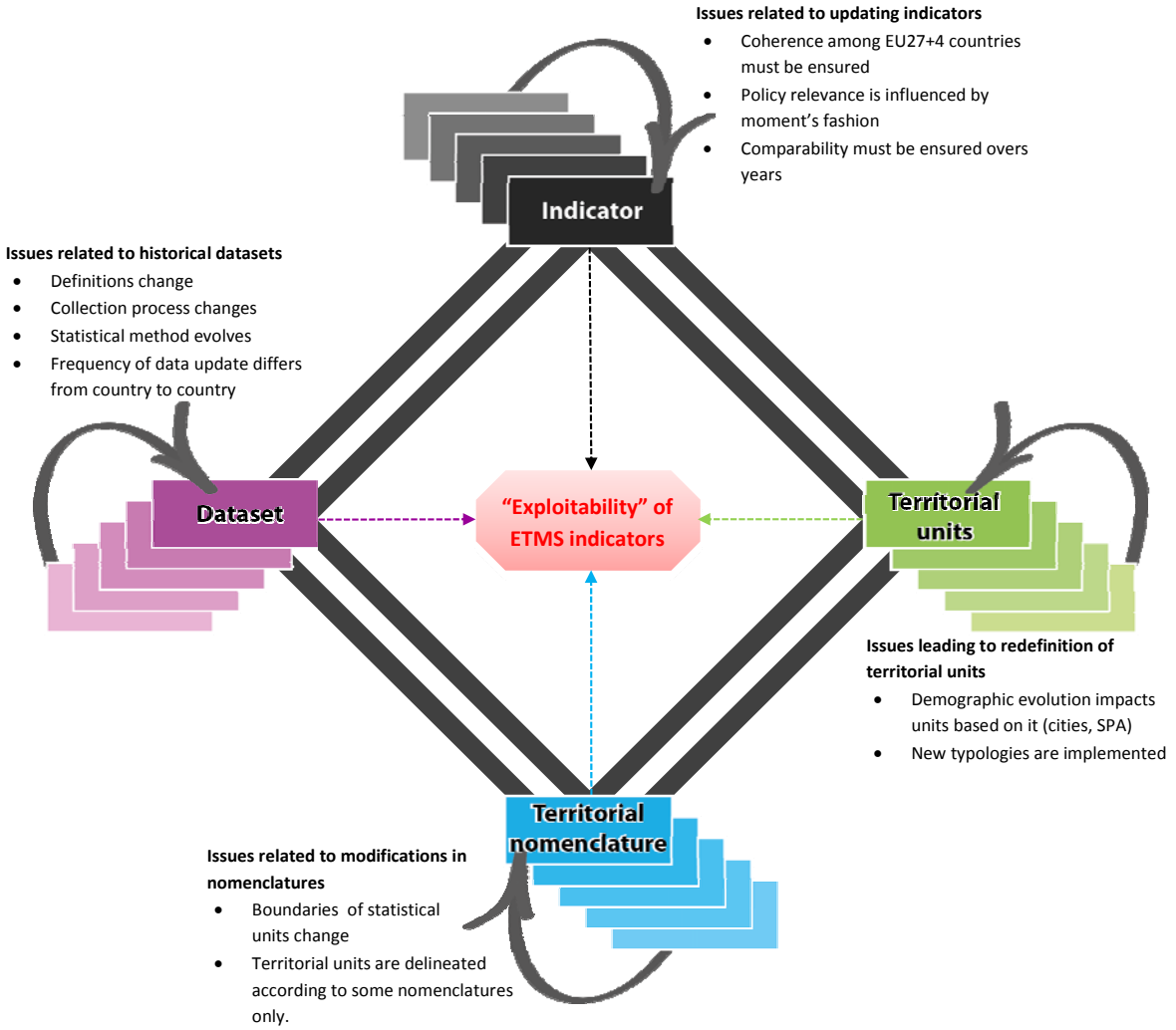

Figure 7. The time-related challenges of the ETMS

Figure above brings together these different time-related challenges of the ETMS, grouping them according to four main components of the ETMS:

- datasets
- territorial units
- territorial nomenclatures
- indicators

The figure shows how the extent of these time-related challenges and the ways in which they overcome largely determine whether indicators can be useful in the context of an ETMS (i.e. its "exploitability").

As part of the M4D project, there are attempts at constructing coherent time series for population figures on the basis of a semi-automatic procedure using the "R" programme. Members of the M4D project team also consider developing a dedicated programme that would combine figures associated with different geographic delineations in a fully automated way. This initiative is still at a preliminary stage, and would be implemented independently of the ESPON programme. A more detailed technical report on these issues will be submitted by the M4D TPG at the end of June. These considerations will then be incorporated in the ETMS.

Generally, the objective is to produce trend data for current NUTS or LAU nomenclature (that are a priori of the greatest interest for policy-makers) combining data associated with this nomenclature and with previous NUTS or LAU nomenclatures. This first implies that ETMS calculations need to be continuously updated not only for current figures but also for past ones: recalculation of historical data at a given moment in time will be outdated when new boundary changes occur. Admittedly, to limit the number of boundary changes that need to be considered, one could consider an iterative system in which recalculations of e.g. 1990 data to the 2013 nomenclature would be made on the basis of previous estimates calculated for the 2010 nomenclature. However, the bias induced by such a method would need to be carefully considered. This presupposes that very detailed information on the estimation methods used at each stage are available.

Generally, recalculations between territorial nomenclatures are based on transfer "keys" (or "ratios"). These keys are only applied to stock data, i.e. quantities, and not to ratios. This is one of the reasons for which it is essential that the ETMS is built on stock data. The keys reflect different types of changes:

(1) Mergers: 100% of the stock is transferred to the new geographic units

(2) Split of a region in two or more units: attribution of the stock proportionally to e.g. the number of inhabitants, economically active persons and area of each of the new regions.

(3) Transfer of areas from one region to another region: reallocation of stocks between these two regions proportionally to e.g. the number of inhabitants, economically active persons and area in the areas that are transferred.

This implies that in situations (2) and (3), data at a lower level than the one considered are needed to carry out the recalculation, e.g. using LAU2 data to assess the number of persons that has been transferred between two NUTS3 regions. Furthermore, a number of different recalculations methods can be envisaged:

- one can based the transfer "key" on current figures, or on figures at the time of the split or transfer;
- one can use different types of figures for the same data. Some may be clearly preferable to others (e.g. population compared to area for most socio-economic data), but may not be available for all parts of Europe. Therefore, one needs to consider whether one should apply different methodologies in different parts of Europe to maximise the quality of the estimates, or apply different methods to increase the coherence of the dataset.

The calculation of "potentials" as an alternative to recalculations between nomenclatures of statistical units is presented in section "*Using potentials to facilitate comparisons over time*" below.

5.3 Compiling and processing data for an ETMS

Establishing an ETMS first implies that coherent and comparable indicators can be calculated for different years, which presupposes that detailed metadata are available for each dataset (see next section a) "*Compiling and managing metadata on datasets*"). Secondly, a "toolbox" of methods to deal with missing and heterogeneous data with insufficiently frequent data updates is needed (see section b) "*Dealing with missing and heterogeneous data and insufficiently frequent data updates*"). Finally, given the difficulty and resource-intensive of transfers of data between territorial nomenclatures, the calculation of potentials on the basis of stock data can be considered as an option (see section c) "*Using potentials to facilitate comparisons*").

5.3.1 Compiling and managing metadata on datasets

In the case of datasets, comprehensive metadata procedures have been developed under the ESPON M4D project (along with related DBMS) and should be used as a starting point in designing ETMS metadata for datasets. The objective is to ensure the best possible interoperability between ESPON DB and ETMS.

As demonstrated in the previous section, the time dimension is particularly important in the context of an ETMS. The special attention that needs to be given to data updates, methodological coherence of time series and changes in the boundaries of statistical units implies that some further development of metadata tools are needed.

Some main challenges can be listed:

- Compiling the most recent data, i.e. as soon as they are published by national statistical institutes and other primary data sources;
- Gathering data at LAU2-level, which have not up to now been redisseminated by Eurostat or by any other European bodies;
- Gathering the information needed to convert data between different territorial nomenclatures;

Addressing these three challenges requires the following improvements in the handling of metadata, building on the metadata infrastructure already established by the ESPON Metadata and Data Navigator projects:

1. <u>Dataset sources</u>

   In addition to existing fields in ESPON metadata templates, ETMS needs more precise information on data origin such as census name, contact details of the responsible section or person at each national statistical institute, details on methodologies applied, available years, update periodicity (with information on the foreseen date for the next publication of data) and geographical levels at which data are available.

   The database model of the ESPON Database model foresees that each datasets can be linked to a nomenclature. The details of how this connection is organised will need to be

checked, so that it can function in the context of the ETMS. Ideally, the each nomenclature should also be linked to one or more mapping files.

2. Managing multiple versions of datasets

The ETMS will not only store original data, but also data recalculated according to other nomenclatures and data that have been updated or homogenised on the basis of data at other geographical levels.

Therefore, the ETMS metadata system must make it possible to establish links between these different versions of the same datasets, describing how the original data has been converted to an another nomenclature, updated or homogenised.

3. Making updates possible through detailed methodological descriptions

The long term perspective to be developed within the ETMS presupposes that results can be reproduced irrespective of changes in group of researchers and organisations involved in the process.

This constrain is akin to the principle of "reproducibility", which is one of the main criteria for the validation of scientific results in so-called "hard sciences". The complexity of measures in social sciences makes often strict "reproduction" in different contexts and with different reference periods impossible. Access to detailed metadata is all the more important, so as to be able to produce as comparable results as possible.

Next table provides an overview on the compulsory metadata fields related to data collection in ETMS.

(*) Green text corresponds to standard metadata in ESPON database

Field	Information	Details
Background information on data compilation process	Who compiled the data? When was it done?	• Date of compilation • Responsible party
Sources	URL, when available Procedure to obtain data Data from census, register, remote sensing, other sources.	• Provider • Census name • Contact details of responsible NSI section / person in charge of dataset • Details on defini-tions/methodologies • Costs
Characterisation of data	What is measured?	• Data type • Units of measure
Availability (years)	For which years are data available?	
Frequency of updates	Frequency of updates Foreseen next delivery	
Statistical geographical level	From LAU2 to NUTS0 / grid	• Which levels available?
Restriction of use	Licensing conditions	• Rights of redissemination • Confidentiality

Field	Information	Details
Associated mapping files	URL when available	• Provider • Map name • Contact details • Costs
Data harmonisation	Provide full methodology, when relevant Link to original dataset	• Source • Method • Scripts/tables
Spatial transformation (conversion between nomenclatures)	Provide full methodology, if any Link to original dataset	• Source • Method • GIS command used • Scripts/tables • Etc.

Table 6. Metadata requirements for the ETMS

5.3.2 Dealing with missing and heterogeneous data and insufficiently frequent data updates

A European monitoring system will be confronted to missing data, disparate data update frequencies, especially at the lower geographical levels (NUTS3, LAU2), and to data that have been compiled using different methodologies. Therefore, it will be necessary to set up rules and methods on how to deal with these types of challenges.

The ESPON 3.2 project has proposed different methods for the estimation of missing data, based on their temporal dimension, spatial dimension or on a combination of these two dimensions. These methods can be applied to the ETMS.

Different approaches can be considered for the homogenisation of data. For many datasets, Eurostat provides harmonised datasets for the EU27, and in some cases also for the entire ESPON Space. However, the geographic resolution of these data is generally limited, as a limited number of data are available at for NUTS3 regions, while most are only provided at the NUTS2 or NUTS0 levels.

When seeking to produce homogenous data at lower geographic levels, the TPG therefore needs to combine Eurostat data higher geographic levels with methodologically heterogeneous data collected from national sources for smaller regions and local areas. Concretely, lower level data are used as a key to distribute upper level harmonised data, as illustrated in the right part of next figure “Data estimation methods”. As a result, comparable estimates at lower geographic levels are produced, making it possible to characterise territorial units delineated at these scales. It is worth noting that the degree of reliability these estimate depend on the quality of homogenisation process made by the provider of higher level data (i.e. Eurostat, in most cases). These methods should therefore be identified and assessed when implementing the ETMS.

A third type of challenge for the ETMS concerns insufficiently frequent data updates. For example, in countries where local data is compiled through censuses and not registers, local datasets are only updated for one year per decade. In addition to providing an unsatisfactory basis for yearly monitoring report, these census data may correspond to different years depending on the country that is considered. On therefore needs to estimate data for inter-census years, using a similar method as the one describe above for the harmonisation of data. As described in the left part of the figure, higher levels data that are updated on a more regular basis can be used to calculate estimated values for lower administrative levels. The quality of these estimates will depend on the extent of changes in territorial patterns between the census year

and the year for which estimates are calculated. One may assess the extent of these changes by consulting experts of the different considered areas.

In many cases, a given dataset can both be adjusted between years and in view of compensating for heterogeneous methods.

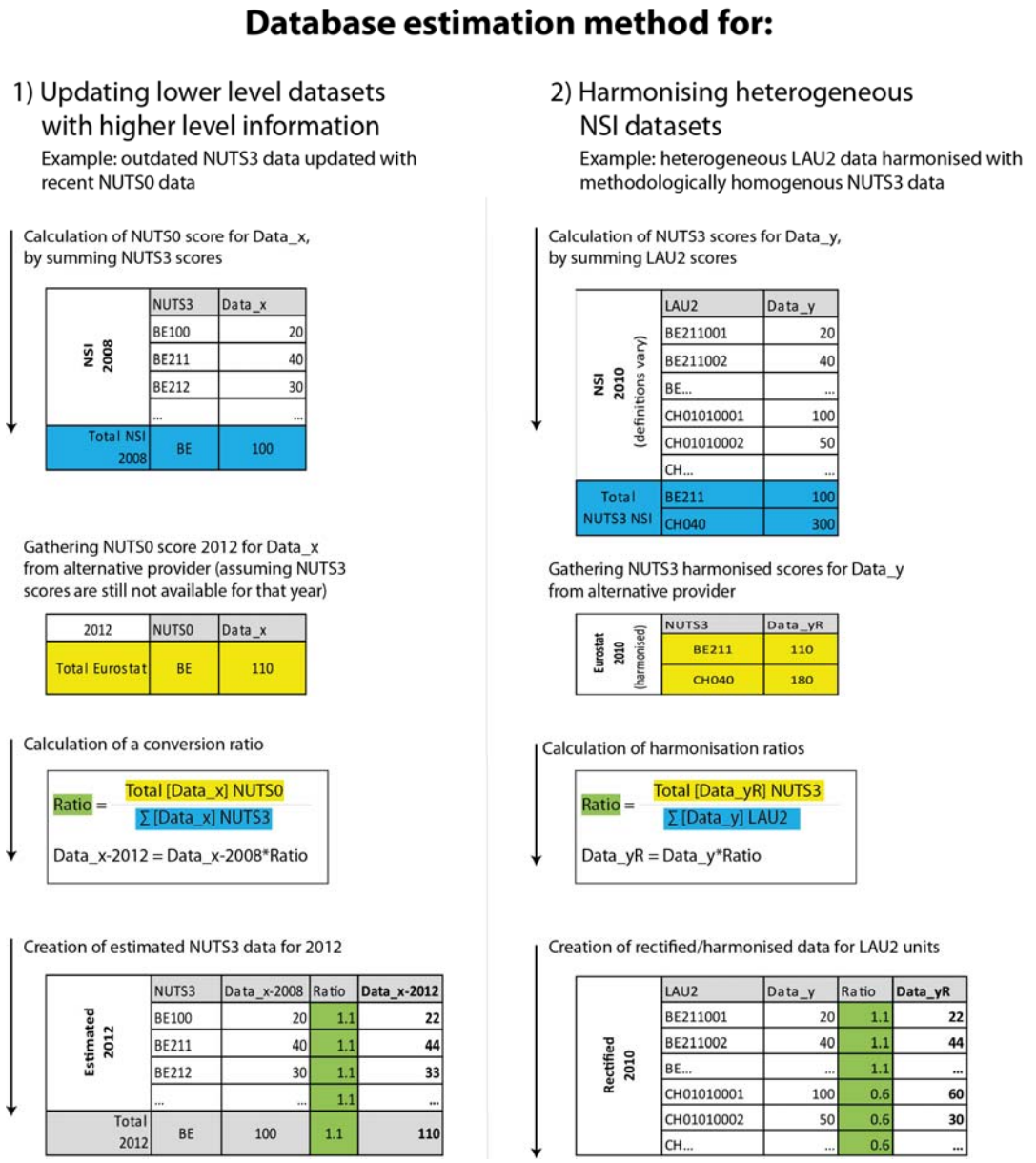

Figure 8. Data estimation methods. The time-related challenges of the ETMS

5.3.3 Using potentials to facilitate comparisons over time

Converting data between spatial nomenclatures can be extremely resource-demanding. It therefore may be justified to search for methods that would make it possible to circumvent this issue.

Calculating a “potential” implies summing up stocks (e.g. of population, wealth or area with a certain type of land use) within a distance within which spatial interaction can be presumed to be occurring (empirical approach) or be considered desirable (normative approach). The distance

can be Euclidian or based on time-distances; it can be calculated taking into account obstacles such as national borders, language borders or a constraining topography when relevant. Typically, daily mobility ranges can be used as a starting point when identifying the distance to be considered. The method for the calculation of potential is illustrated in next figure.

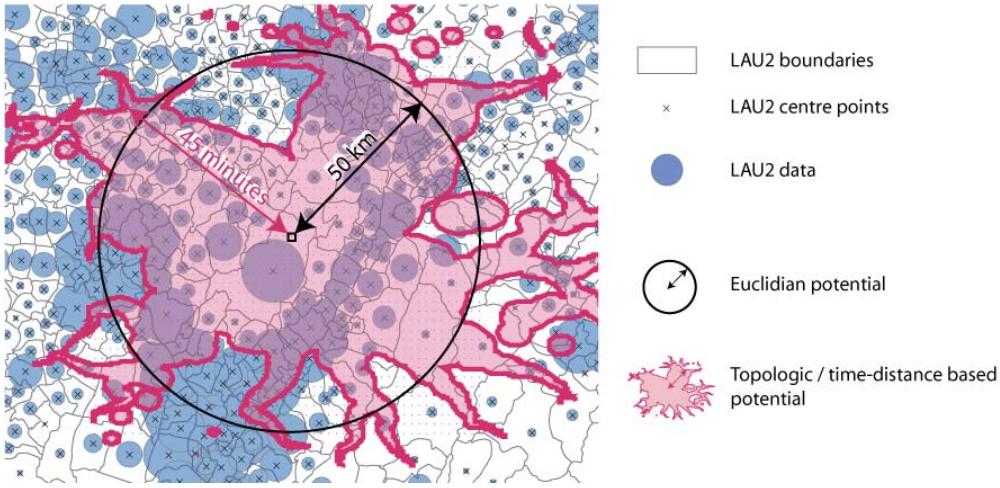

Figure 9. Calculation of potentials based on LAU2 data

Data associated with all LAU2 of which the centre point falls within the 50 km circle or area accessible within 45 minutes are summarised; this sum is the "potential". This means that the same data are taken into account as many times as they are associated to LAU2 units that are part of the potential functional neighbourhoods of the points of measurement.

One can also calculate potentials by using a negative function of distance. The hypothesis is then that the relevance of stocks for an area decreases with the distance to that area. A number of different decreasing functions of distance can be envisaged (see Grasland, 1991[8]).

The primary purpose of potentials is not to avoid MAUP-related challenge. The underlying idea is rather that individual regions and local areas should not be considered in isolation from each other when considering development opportunities and challenges. It is more relevant to consider areas of potential interaction around each point. Potentials can be calculated for each point in space, making it possible to identify disparities within each region or local area. An additional advantage is that bias resulting from differences of size between statistical units is much reduced when calculating potentials, as compared to analyses focusing on individual units.

This also implies that potentials calculated for two different years can be comparable, even if the background data are linked to different nomenclatures of statistical units. This greatly facilitates comparisons over time. Potentials can therefore be a relevant method for the ETMS.

Admittedly, the process of producing population potentials is relatively complex, as illustrated by next figure. For regions composed of multiple parts (e.g. coastal regions with islands and region with enclaves in other regions), it is first necessary to estimate the population in each of their components. These populations per part of region or local unit are then transferred to a grid. In this example, time-distances are calculated on the basis of an "impedance grid". This implies that

the time needed to travel through each grid cell is estimated on the basis on number and quality of the roads crossing it, of its land cover and topography (terrain roughness). Obstacle such as rivers and railroads are also taken into account.

Population values can be combined to calculate indicators. E.g. a population potential could be combined by an income potential, to calculate an average income per. inhabitant within daily mobility distance. Similarly, employment rates could be calculated on the basis of total employment and total working age population potentials.

A limitation of the method lies in the communication of results. These results would not be in the format most stakeholders are used to insofar as each region or local unit is considered in relation to its surroundings, rather approached taken in isolation. However, one may calculate averages of potential values within each regions, or the proportion of regional population or areas that meet target values. One may furthermore expect stakeholders to become more accustomed to the "smoothed" representations based on potentials if the ETMS helps popularising this type of approach.

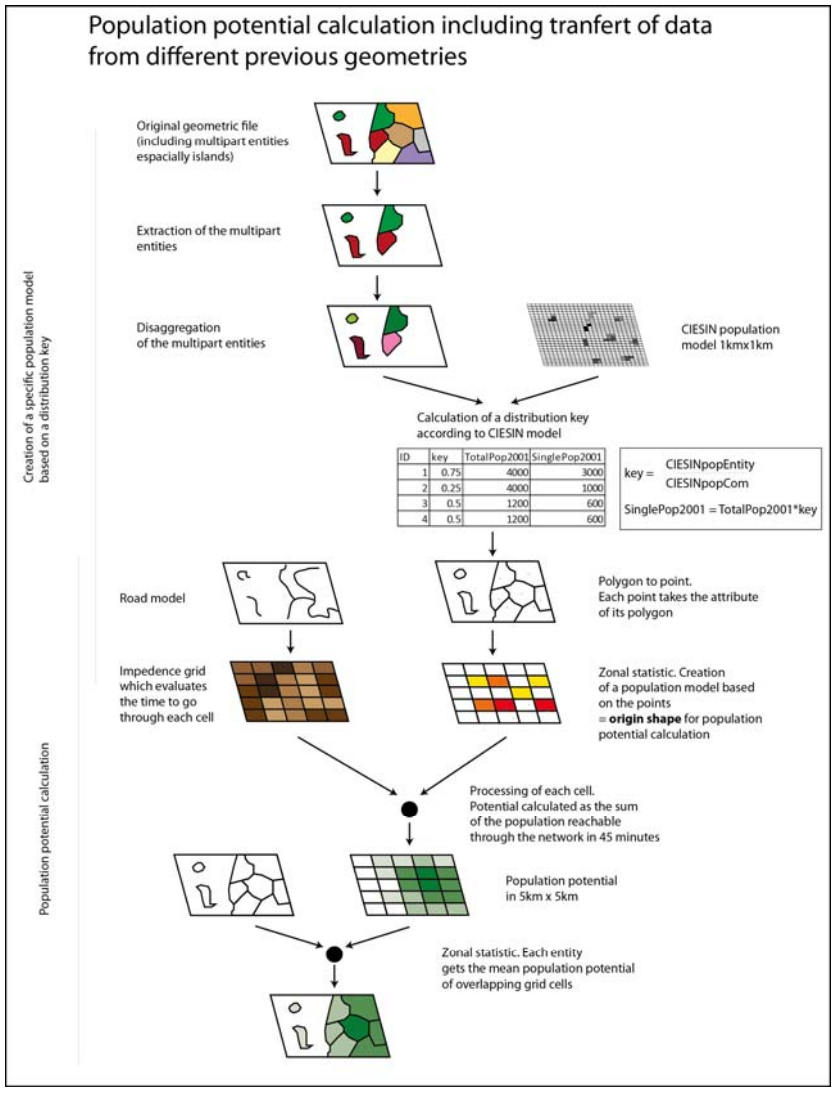

Figure 10. Method for the calculation of potentials. Source: ESPON GEOSPECS

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[8] Grasland, Claude (1990) « Potentiel de population, interaction spatiale et frontières : des deux Allemagnes à l'unification » in *Espace géographique*, Vol.19-20 n°3, 1990. pp. 243-254. http://www.persee.fr/web/revues/home/prescript/article/spgeo_0046-2497_1990_num_19_3_2992

5.4 The operation of the ETMS: inputs, process and outputs

Based on the considerations above, a proposal for the operation of the ETMS can be formulated. This proposal is illustrated in 0next figure below.

As a policy-driven instrument, the ETMS primarily receives inputs in terms of "thematic entry points" and "territorial entry points" defined by policy documents. As mentioned above, a balance needs to be struck between immediate policy demands and the long-term coherence of the ETMS. For example, including "Macro-Regions" as one of the territorial entry-points implies that macro-regional strategies are expected to become more established component of European territorial governance over coming years.

Indicators are designed in relation to both these entry points, as some issues are primarily connected to certain types of territories. However, the constrain of data availability is an obvious limitation in this process. Furthermore, for the operation of the ETMS, data only become useable ("exploitable") insofar as there is metadata of sufficient quality associated with it. Indicators can then be constructed by combining different datasets, as described above.

The operationalization of the territorial entry points presupposes the identification of territorial units. Each of the ETMS's four territorial entry points (Regions, Cities, Territories and Macro-regions) can be associated with a different analytical units:

- Regions are primarily associated with NUTS2 and NUTS3 units. However, for some analytical purposes, these levels can be mixed so as to obtain more homogenous regions either in terms of extent or total population. This is for example the case of the so-called "NUTS2/3" used by a number of ESPON project, and for the "Territorial Levels" used by the OECD[9].

- Cities have been delineated in different ways by the Urban Audit, which refers to the notions of "City level", corresponding to what is generally perceived as the "urban core" and "Larger Urban Zones" (LUZ) that reflect the extent of the "Functional Urban Region". In ESPON, the corresponding notions are "Morphological Urban Area" (MUA) and "Functional Urban Area" (FUA). In addition, in many respects, the monitoring of cities and urban regions is primarily meaning ful in relation to their respective territorial context. The more prospective notion of "Potential Urban Strategic Horizon" (PUSH), corresponding to the areas accessible within 45 minutes by road from MUAs, reflects these types of concerns

- The entry point "Territories" encompasses a wide variety of categories, e.g. Mountains, Islands, Sparsely populated areas (SPA), Coastal zones, Ultra-peripheral regions and border regions. Except for Ultra-peripheral regions, these categories have been delineated in a number of different ways, e.g. in the Green Paper on Territorial Cohesion, the Fifth cohesion report and in ESPON GEOSPECS. This diversity of methodologies also imply that different geographical scales are considered.

- Macro-regions are defined at different geographic levels, from NUTS0 to NUTS2. The Baltic Sea Region also includes regions in Russia. However, in view of gaining an

[9] "For European countries, [the OECD classification of regions" is largely consistent with the Eurostat classification - facilitates greater comparability of regions at the same territorial level. The differences with the Eurostat NUTS classification concern Belgium, Greece and the Netherlands where NUTS2 level correspond to the OECD TL3 and Germany where the NUTS1 corresponds to the OECD TL2 and the OECD TL3 corresponds to 97 spatial planning regions (Groups of Kreise). For the United Kingdom the Eurostat NUTS1 corresponds to the OECD TL2. http://stats.oecd.org/OECDStat_Metadata/ShowMetadata.ashx?Dataset=REG_LAB_TL3

understanding of territorial trends and challenges in macro-regions, one would generally need to go to lower geographic levels such as NUTS3 regions and urban areas.

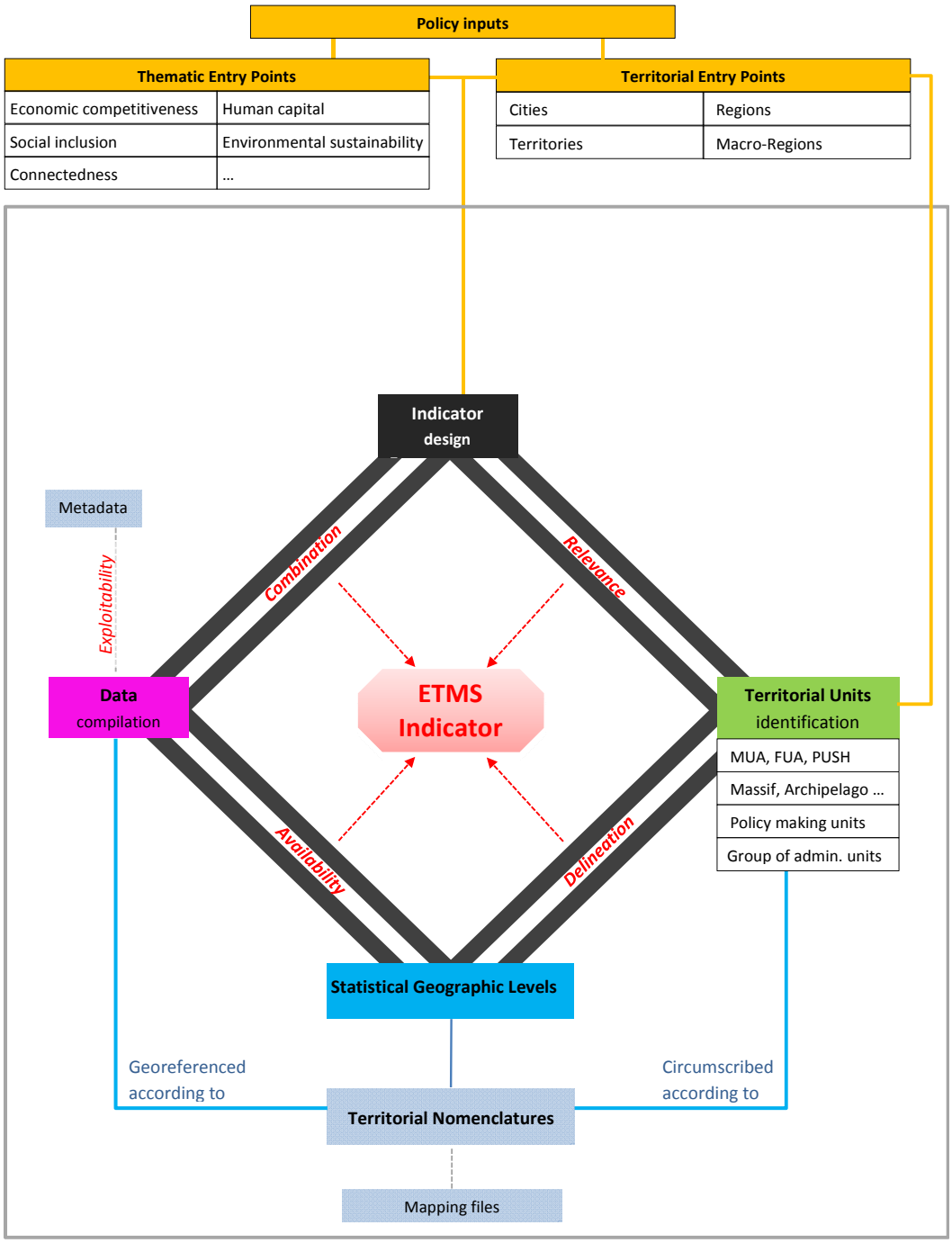


Figure 11. The ETMS process: overcoming a number of interlinked limitations and challenges

This implies that there are multiple connections between territorial entry points and analytical units. Some analytical units can be relevant for different territorial entry points and each territorial entry point requires different analytical units.

The relevance of each indicator for each territorial unit can be assessed by taking into account the policy questions that initially led to the design of the indicator. However, the feasibility of the application of an indicator to a territorial unit will depend on the geographical level at which data

are available. Furthermore, indicators are not meaningful at all scales: Gross Domestic Product is not meaningful below NUTS3 level, and the analytical value of measures below NUTS0 level is limited. Inversely, measures of demographic polarisation at NUTS3 level or at a higher scale do not reflect the most processes of rural-urban migration.

Each statistical geographical level is defined with reference to a territorial nomenclature. These nomenclatures, which vary depending on the year considered, are in turn used to georeference datasets and to delineate territorial units. Whenever there is a mismatch between nomenclatures of delineation and of georeferencing, the ETMS will have to apply conversion methods such as those described above (see section "*The time-dimension in ETMS*" earlier in this chapter).

Overall, the calculation of ETMS indicator therefore needs to overcome combined constrains related to the possibility of:

- combining datasets corresponding to the indicator designed;
- calculating the indicator for territorial units that are relevant, in view of producing a meaningful indicator and of answering policy demand;
- delineating the territorial units at the appropriate geographic level;
- having access to data at the appropriate geographic level.

As result of above mentioned challenges that ETMS is facing - i.e. ensuring its capacity to periodically and consistently update indicators - collection of datasets and related materials must follow a strict validation process. Particular attention must hence be given to elements that ensure reproducibility of the system over time. These elements can mainly be related to three categories of materials (data, metadata and mapping files) and one condition: the ability to implement time series. Figure below "Data Validation Process" summarises this process of collection/validation.

Once the ETMS project has defined suitable indicators, related dataset and the scale(s) at which they should be calculated, the first step consists in identifying potential providers. Have these data already being collected in ESPON DB? If not, are they available by alternative providers (EU agencies, NSI, others…)? Who can provide the latest release?

As a next step, the capacity of collecting comprehensive metadata detailed in the above section on compiling metadata (see section "*Compiling and managing metadata on datasets*" earlier in this chapter). The collection of metadata will in most cases require personal contacts with the organisation providing the data, as complete metadata for the purpose of the ETMS (see "Table 6. Metadata requirements for the ETMS") are seldom provided with the datasets.

In the perspective of future updates - i.e. recalculation needed as result of MAUP - it is essential that datasets can be linked with the appropriate mapping file for geo-referencing. These mapping files are therefore to be collected and stored as a component of the ETMS, even when they are not used for producing ETMS maps as such. When data for previous years cannot be georeferenced using standard ESPON or Eurogeographics digital maps, one can use mapping files from national sources.

Lastly, one needs to consider whether the dataset can become part of a time series composed of coherent data. For this purpose, the comparability of the datasets for the different years needs to

be assessed, as well as the quality of their respective metadata and mapping files. In other words, the following questions should addressed:

- Are metadata comprehensive enough to allow duplication by a third party?
- Is it possible to geo-reference data using standard European maps? If not, are other digital maps available?
- Is the data updated on a regular basis?

Dataset that satisfy these different criteria can be considered suitable for ETMS database. Dataset, mapping files and metadata can be collected, processed and stored in ETMS format.

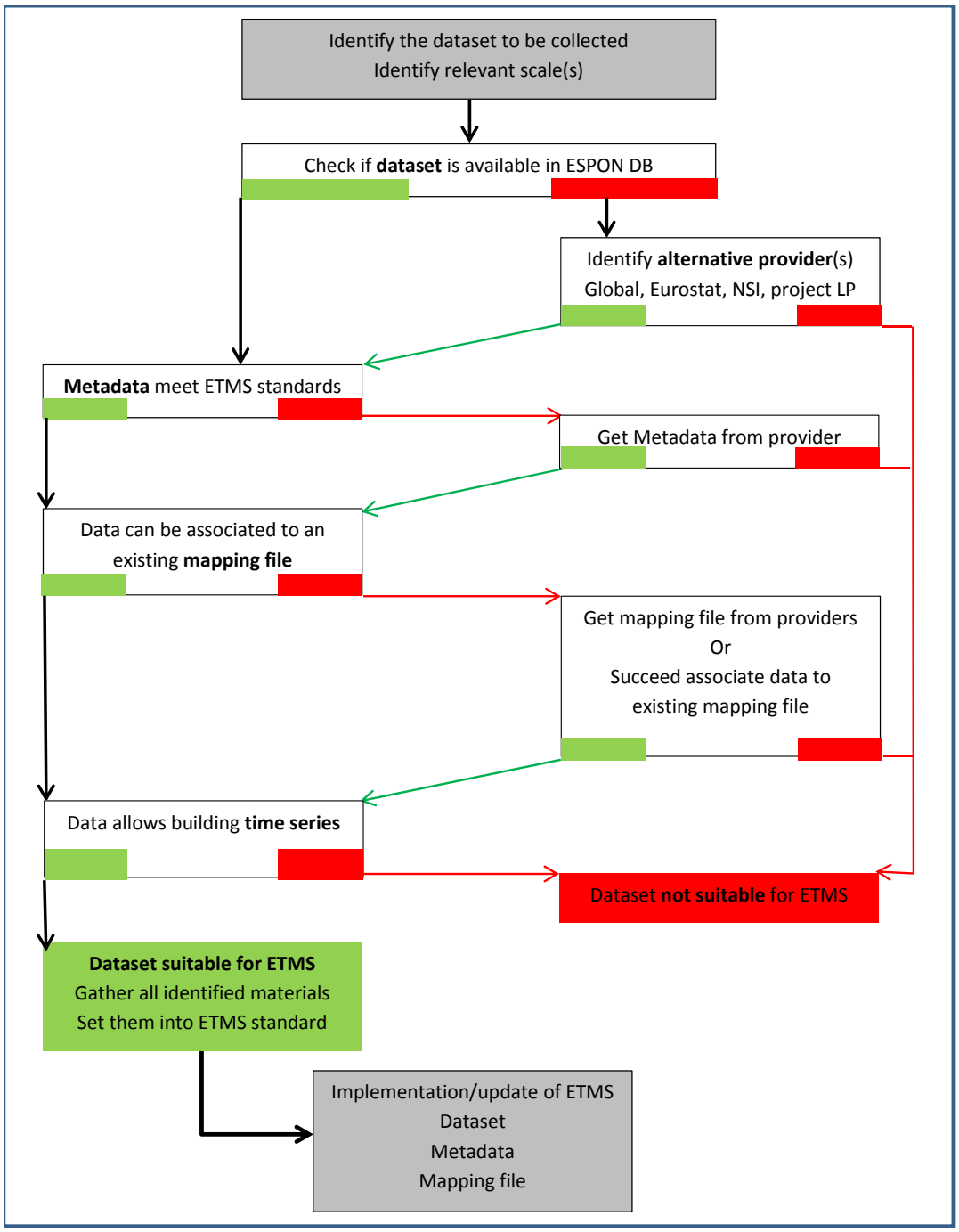


Figure 12. Data validation process

5.5 Concluding remarks

The review of perspectives, constrains and challenges for the ETMS shows a number of common points with the so-called ESPON "Long Term Database" that was introduced by the ESPON 3.2 project and that the ESPON M4D project has started to implement by compiling coherent time-series for a limited number of indicators. Many of the recommendations of the ETMS are akin to "10 commandments for data collection" proposed by the ESPON 3.2 project[10].

The challenge for the ETMS lies in combining a long term perspective with frequent updates based on the most recent data available data, so as to be able to provide policy-relevant results. This implies that ETMS data will necessarily evolve, as estimated recent data at lower geographical levels will progressively be replaced or corrected as data become available from national and European sources. This is a challenge in terms of communication of results, as they may change over time.

One can also not the high degree of complexity of the ETMS, due to the large number of constrains. For this reason, it is important that the instrument remains focused on addressing these challenges linked to the constitution of coherent time-series for territorial data. Data at national (NUTS0) level may be useful for analyses derived from the ETMS, but they are already compiled and managed by other online databases, e.g. those provided by the World Bank and by the OECD. It therefore seems unnecessary to incorporate these data directly in the ETMS. Similarly, an incorporation of the neighbourhood of the ESPON space in the ETMS would be premature.

The frequency of updates of ETMS indicators is most likely to be dictated by data availability rather than chosen. An ETMS that would compile regional data independently of their publication by Eurostat would require large and stable human resources and a well-established network of national contact points. Regular, direct personal contacts with national statistical institutes would be needed, as well as extensive efforts to estimate figures for countries delivering less-frequent updates of data. It is therefore doubtful that a perennial ETMS could be run in the context of an ESPON-project as they are currently administrated and organised.

[10] http://www.espon.eu/export/sites/default/Documents/Projects/ESPON2006Projects/CoordinatingCrossThematicProjects/Scenarios/fr-3.2-DN2_Final_Jan2007.pdf

6 Preliminary Orientations on the Design of ETMS Products

6.1 Benchmarking activities

The preliminary orientations on the ETMS Products hereby provided are based on a comprehensive review and analysis of the most successful experiences of Territorial Monitoring Systems at different scales (Global, European, National or Regional scales).

The Inception Report already provided a number of references to be considered for the design of ETMS system and products. All references were stored at the project website (http://80.33.141.76/etms/). These references have been further explored for elaboration of proposals in this Interim Report, specifically identifying those characteristics bringing added value to the ETMS. Aspects considered are, among others: organisational structure, financial sustainability, software applications and hardware tools used, information and other services provided, in particular the indicators used.

The outputs of the systematic analysis and benchmarking of existing Territorial Monitoring Systems is included at full in ANNEX II of this Interim Report. In particular the following elements have been analysed:

- *Monitoring Systems at World, European and Regional levels*; as references for the ETMS Monitoring System
- *Existing ESPON Tools and their functionalities*; as references for the ETMS Trend Analysis Tool.
- *Fact&Figures publications*; as reference for the ETMS Facts and Figures booklet
- *Periodic Monitoring Report by reference institutions*; as guidelines for design of the ETMS Monitoring Report

6.2 ETMS Website Portal

6.2.1 Design and Orientation

The user-interface of the EMTS is designed to provide policymakers with easy understandable and condensed information on facts on trends related to European territorial development issues according to policy aims and objectives; main capabilities include fast retrieval of information and data mining, as well as mapping and analytic options.

The main two referents for the design of the ETMS Portal Website are the portals by the International Monetary Fund (IMF) and the World Bank (WP).

Following a similar strategy to the IMF's, the ETMS portal is intended to provide different kinds of information related to territorial monitoring, such as featured news on territorial developments, relevant extracts from the latest F&F and Monitoring reports, direct access to the full ETMS Publications (F&F and Monitoring Report) and links to complementary analysis materials (e.g. policy briefs, policy discussions). ETMS may also consider making use of tools facilitating the on-line discussions (e.g. available on Social Networks).

A central element of the ETMS homepage will be the link to the Data Analysis Tool directly incorporated into the central area of the portal. Selected charts, tables and maps may be also incorporated in the homepage when relevant. The ETMS Portal Website and the Data Analysis Tool will have similar design, in line with the ESPON style book, aiming at making it clear that both tools form a unique entity.

Additionally, the ETMS will contain a full database of reference monitoring materials, at World, European and Regional levels.

Following the approach by the WB Portal, the ETMS aims at combining quick access to the most important information, which is crucial for most of the common users, with the possibility of detailed analysis for expert users.

6.2.2 Proposal of ETMS Portal Website layout

ETMS is designed as a highly practical and user-friendly tool customised to the needs of different policy-makers and stakeholders groups. The design is based on a modular approach, integrating decentralised and interconnected modules easy to be maintained and updated.

The main components for the ETMS are the following:

- Data Analysis Tool. Made available in the central area of the ETMS Portal front page. It is provided as a link which opens an independent Data Analysis module on a separate window. It allows for searching and displaying indicators for different themes and territorial entry-points. It allows downloading the database behind displayed indicators. The Data Analysis tool is described in-depth in the next section of this Interim Report.

- Publications. This section leads to the latest editions of the two written publications periodically produced by the ETMS: the Facts & Figures Booklet, and the Monitoring Report. The section also allows downloading data associated with these reports, and consulting previous releases.

- Indicators at Regional Level. This section allows consulting other indicators outside the ETMS system for the ESPON space. It is proposed that this section contains links to RIMAP, allowing consulting all ESPON DB available sets through the graphical interface of this ESPON tool, and to ESPON MapFinder, allowing consulting most relevant maps produced within the ESPON programme.

- Virtual library. This section, developed add-hoc by the ETMS, contains a database of most relevant monitoring resources. Up to now, the Virtual Library contains more than 350 references, from around 100 global, European and regional institutions. The tool (currently on an initial draft version) allows browsing resources by monitoring products or by provider institutions. For each resource, basic information and link to the original document is provided

- Current Policy Debate. Taking advantage of the much valuable “Map of the Month” ESPON activity, it is proposed that the ETMS could, once delivered to the ESPON CU, host this initiative as part of the monitoring activities by the ESPON Programme. Maps of the Month would continue to be periodically published depicting territorial challenges, along with their initial policy interpretation (just as it is being done today), and the proposal would be to allow users commenting, attempting at articulating debate around the topic. The initial policy thread could be published by respected expert.

- Policy Briefs. Considering the large amount of knowledge being produced by ESPON projects, it is proposed that Policy Briefs were elaborated based on the final outputs of these projects as a means of building a background knowledge repository to complement the direct results of the ETMS monitoring activities.

All these elements are displayed in the ETMS Portal website layout as proposed in the following image. This image is extracted from the initial mockup version of the future ETMS Portal website,

available online at http://80.33.141.76/etms-project/. This website is the embryo of the future ETMS Portal, and will be constantly updated throughout the development of the project until its final delivery to the ESPON CU towards the end of 2014.

Figure 13. ETMS Portal website layout proposal

Online embryo avaialbel at http://80.33.141.76/etms-project/

After a first review of existing monitoring experiences and the elaboration of preliminary proposals, personal contacts with relevant monitoring institutions will be carried out in order to exchange more precise information related to their experience and invite them to participate in the definition of ETMS by giving their opinion and suggestions to the ETMS concept and design to be elaborated later on. This process is further detailed in chapter 7 of this report "*Stakeholder Communication*".

6.3 ETMS Data Analysis Tool

6.3.1 Design and Orientation

The main purpose of the interface is to present the geo-based informational content of the ETMS to its users, especially policy makers, in a simple, easy understandable, but also in interesting and attractive way. Based on experiences derived from previous work on other projects which deals with the geo-based information, the way of presentation of the project results is one of the crucial factors which influence the evaluation of the whole work.

The interface will be dedicated to visualisation of indicators values, their distribution and development in order to describe structures and dynamics related to Europe, its cities and other types of regions, including neighbouring regions. The platform will also serve for user analysis of indicator values, including comparison of different regions or comparison with regional/European averages etc. Therefore, the platform has to be highly interactive with interconnected components. The platform will display the information using interactive map supplemented by interactive charts or tables. Also the textual explanation of thematic context for each type of indicator, territory or analysis displayed as well as metadata will be incorporated. Links to particular indicator/analysis related outputs of previous ESPON projects should be also included.

The solution for the platform will be based mainly on the open source software and programmed using royalties-free online knowledge. Displaying of both indicator values and vectors of analytical units in the interface will be based on communication with the ETMS database and data series updating on regular basis will be enabled. Data queries will be optimized to allow users efficient interaction. Displaying of additional geo-data layers in the map will be possible through OGC standard web services (e.g. WMS).

6.3.2 Requirements and specifications

Based on benchmark results introduced in the Chapter 3 and also based on experiences gained through previous developments of similar applications, main requirements on the application have been specified as follows:

- application has to be user friendly, easy to use with appealing design
- user interface has to be well arranged, including control components (e.g. buttons, sliders, checkboxes, dropdown lists), allowing users to control the tool settings, properties and outputs
- information content has to be well structured and accessible via multiple “entry-points” – territorial types and topics/themes
- overload by information or elements has to be avoided
- indicators sets will be specific according to its relevant “entry-point” (territory/theme)
- all the statistical/graphical information has to be set into thematic context (using e.g. textual explanation)
- content of particular analysis for relevant themes and territory types will be carefully considered and discussed within the whole TPG
- the representation/visualization of particular thematic information has to be carefully considered, in order to avoid its misinterpreting
- ESPON mapping/charting rules has to be respected in symbologies for maps and charts for particular indicators
- components will be interconnected and interactive
- responses on user queries have to be well optimized
- map window should be the largest component of the interface

- flexibility in the sense of adding new region types, topics, user types, time horizons etc. has to be assured

Incorporated components and functionalities will provide the user following possibilities:

- access to the indicators or indicator based analysis via multiple “entry-points”:
    - territorial types
    - topics/themes
- interactive switching between different levels and types of analytical units (e.g. different NUTS levels, countries, ESPON space, neighbour regions, different types of territories – e.g. mountain regions etc.)
- interactive switching between different years or periods
- selection of analytical units through all map, charts and hierarchical tree of units
- possibility to compare selected units:
    - between each other
    - with regional (national, ESPON,…) average or other statistical values
    - at different hierarchical levels (expanding hierarchical tree of units)
- possibility to easily access metadata for particular indicators, directly from the interface (incl. data source, calculation description, meaning of indicator)
- possibility to automatically generate regular facts/figure sheets, as well as to export each particular element into static graphics

Implementation of additional advanced functionalities should be considered:

- possibility to upload user´s tabular data (for already integrated analytical units)
- possibility to add user´s polygons
- enable “user profiling” (basic x expert mode or GIS analyst x policy maker)
- possibility of layout customization by user

6.3.3 Proposal of ETMS Data Analysis Tool layout

Based on ETMS requirements and discussions among the TPG, proposal of ETMS analysis tool interface has been prepared. The graphical design of ESPON websites has been adopted. See the picture below representing the ETMS Data Analysis Tool mockup. The following picture provides supplemented explanatory notes for particular sections of the layout.

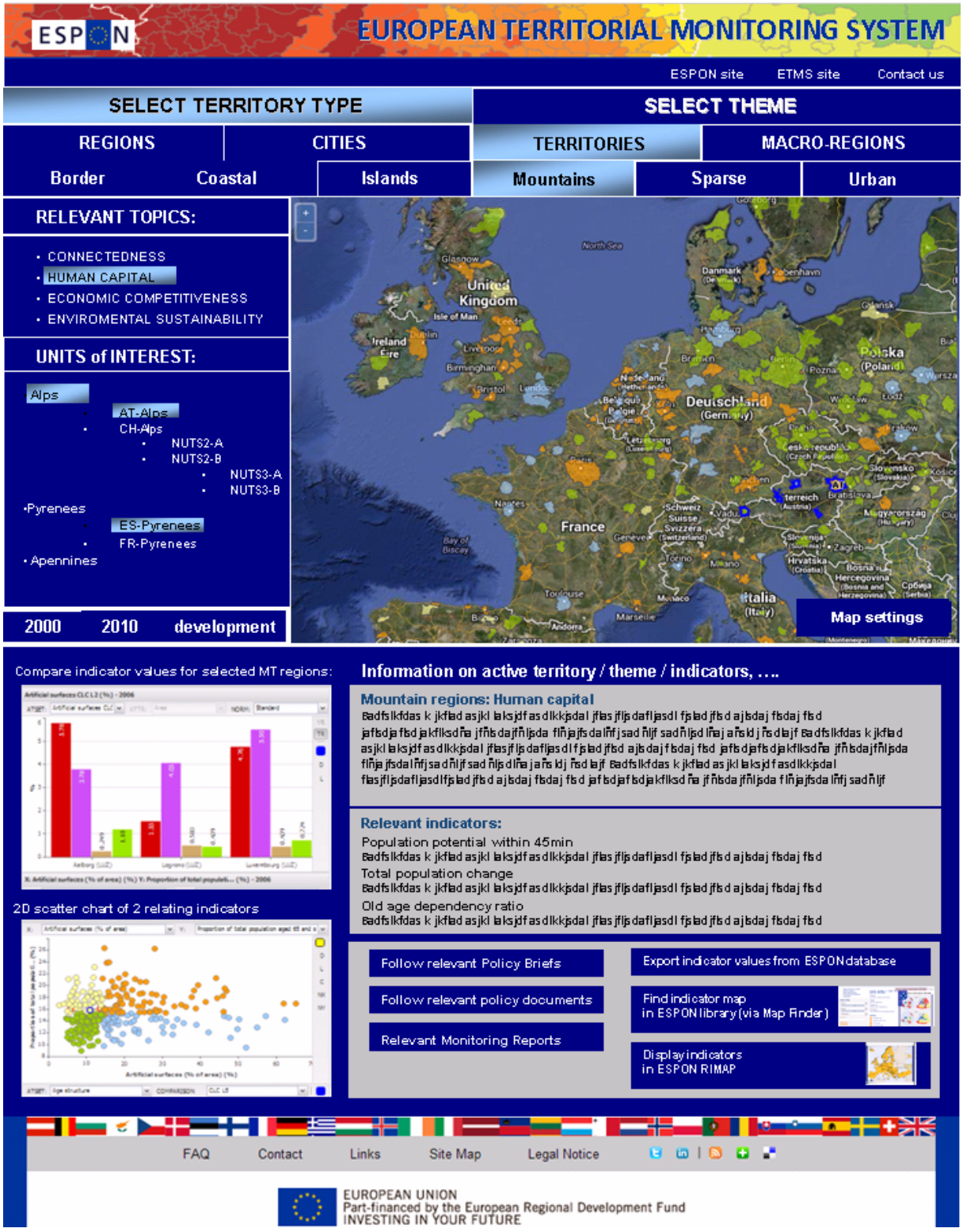


Figure 14. ETMS Data Analysis Tool layout proposal

Selection of entry-point type:
-switching between:
- Territorial entry-points
- Thematic etry points

Specification of analytical units type and topic:
-selection of territories sub-type
-selection of relevant topics (specific to each territory type)

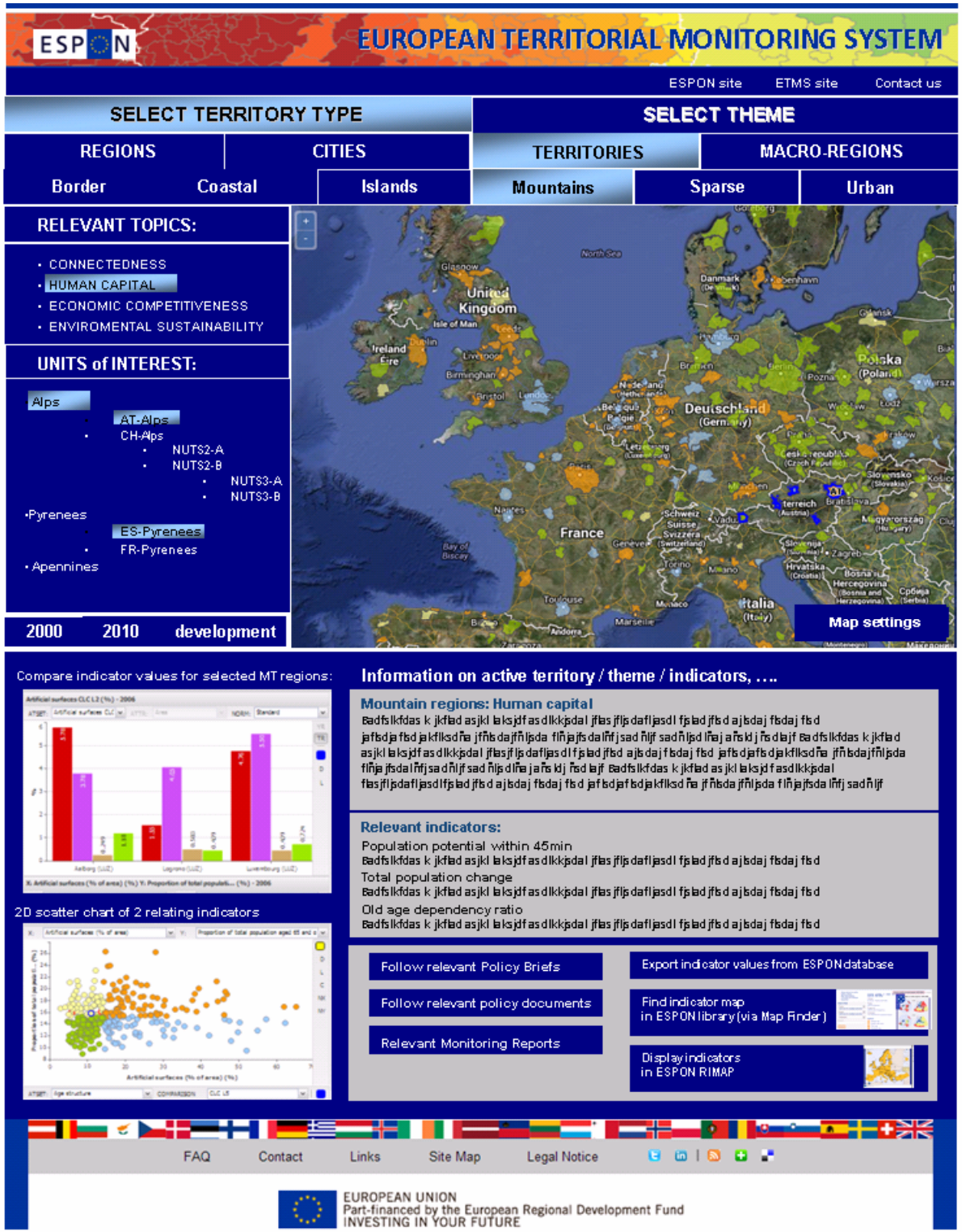
Hierarchical tree of analytical units
- multi-selection of units
- enables comparison of units on different hierarchical levels

Map settings:
- selection of indicator to be displayed in map
- map symbology customization (to be discussed)
- selection of units of interest avoids displaying of too many units in charts

Year / Period selection
-switching of year / period for all components (map, charts)
- displaying trends using animation

Interactive chart 1
enables:
- multi-selection of analytical units
- selection of indicator from indicators´ list related to displayed topic
- normalization of indicators if appropriate
- displaying indicators values for selected unit
- units sorting (descending, ascending, alphabetical)
- comparison with regional/country average
- displying legend

Interactive chart 2
enables:
- multi-selection of analytical units
- displaying all units at selected hiearchical level or selected units only
- selection of indicator from indicators´ list related to displayed topic for both x and y axis
- normalization of indicators if appropriate
- displaying indicators values for selected unit
- displying legend



Links to related portals:
- ESPON site
- ETMS portal
- Contact informations
- etc.

Interactive map
enables:
- standard map navigation
- displaying information (relevant indicator values) on selected analytical unit
- multi-selection of analytical units (interconnected with charts)
- displaying of selected indicator (from indicators´ list related to displayed topic) – particular indicator could be displayed by user)
- normalization of indicators if appropriate
-comparison with regional/country average
-displying legend
-adding anciliary layers (via WMS etc.)

Information on active territory and topic:
- definition of territory type
- description on active topic
- territory/topic specific issues
- territorial policy instruments relevant to this topic (tbd.)
- other relevant information

Description of topic relevant indicators:
-indicators meaning
-what is the indicator about?
-which issues could be identified observing indicator values
- data source, coverage, metadata ...
- other relevant information

Links to relevant ESPON sites
- **policy breefs** relevant to the active topic
- **policy documents** relevant to active topic
- **monitoring reports** relevant to active topic

Access to selected topic/indicators in existing ESPON tools
(if possible, via direct url?)
- in **ESPON database**
- static maps via **Map Finder**
- thematic maps in **RIMAP**

6.3.4 Components of ETMS Data Analysis Tool

Application will incorporate following components:

- menu for territories and themes specification
- interactive map
- interactive charts
- hierarchical tree of analytical units
- description and comments on selected topic and indicators
- links to ESPON sites and tool with relevant topic/indicators

Particular components of application will be interconnected and selection in one of them will influence the appearance of other components, in sense of units or time specification. Both map and charts will provide the user possibility to select one or more indicators, which will be displayed. Definition of particular territorial and thematic sub-types will be further discussed in frame of ETMS TPG as the application architecture enables to modify final selection of themes, territorial sub-types and indicators.

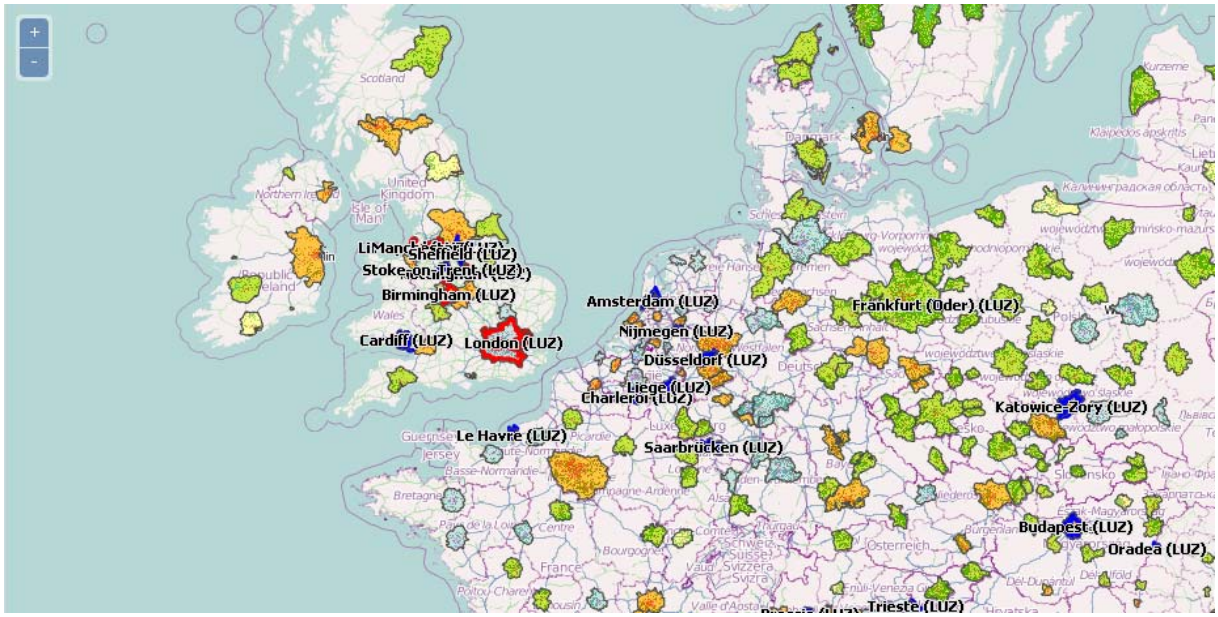


Figure 15. ETMS Data Analysis Tool functionalities: Map display of territorial areas

Following types of charts could be used for ETMS analysing application, depends of types of indicators, which will be displayed and analysed using each type of chart. Also the use of particular chart type for each indicator will be further discussed and specified in TPG. However, if appropriate, also other chart types or tables could be also considered for ETMS application.

Column chart

Column chart is suitable for comparison of values of selected indicator for selected analytical units. Also values for different years could be displayed in the same time. The chart will be interactive in sense of selection of displayed indicator/s, selection of units – which will be

connected with units´ selection in other chart or in map – and also normalization of indicator values (if appropriate).

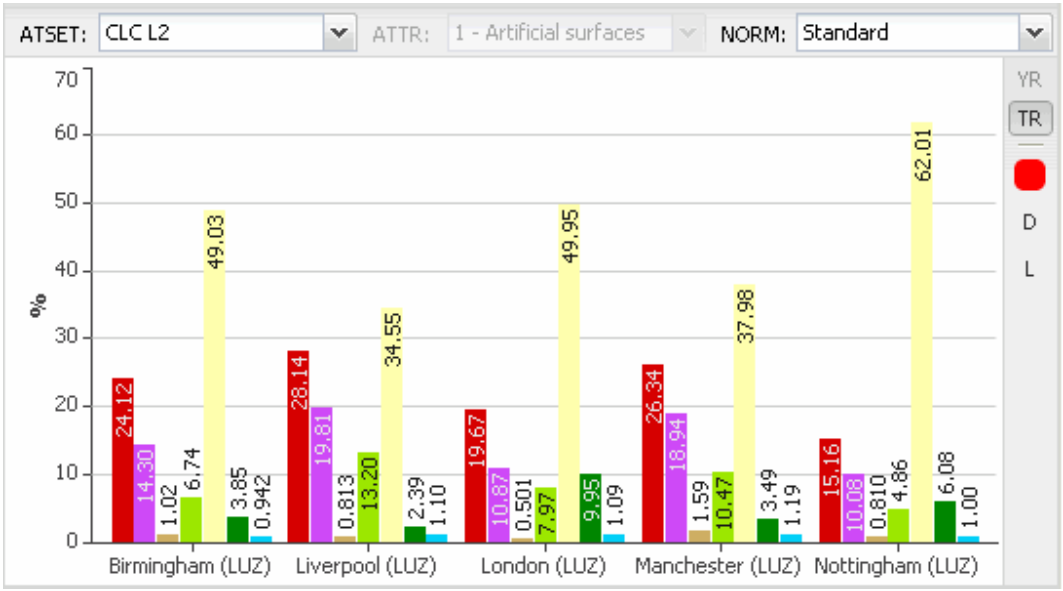


Figure 16. ETMS Data Analysis Tool functionalities: Column Chart

Scatter chart

Scatter chart enables analysis of correlation of two different indicator values – each indicator is displayed on one axis. Distribution of analytical units in 2D space provides the user possibility to observe/assess possible correlation of these two indicators. Selection of analytical units of user interest, as well as switching indicators (from indicators set relevant to selected topic) and possibility of indicator values normalization (if appropriate) will be also available for this chart type.

The 2D space in scatter chart is separated into four quadrants, each of them highlighted by different colour – same colours will be used for units also in map (see picture below) – which provides the user an overview of spatial distribution of values combinations.

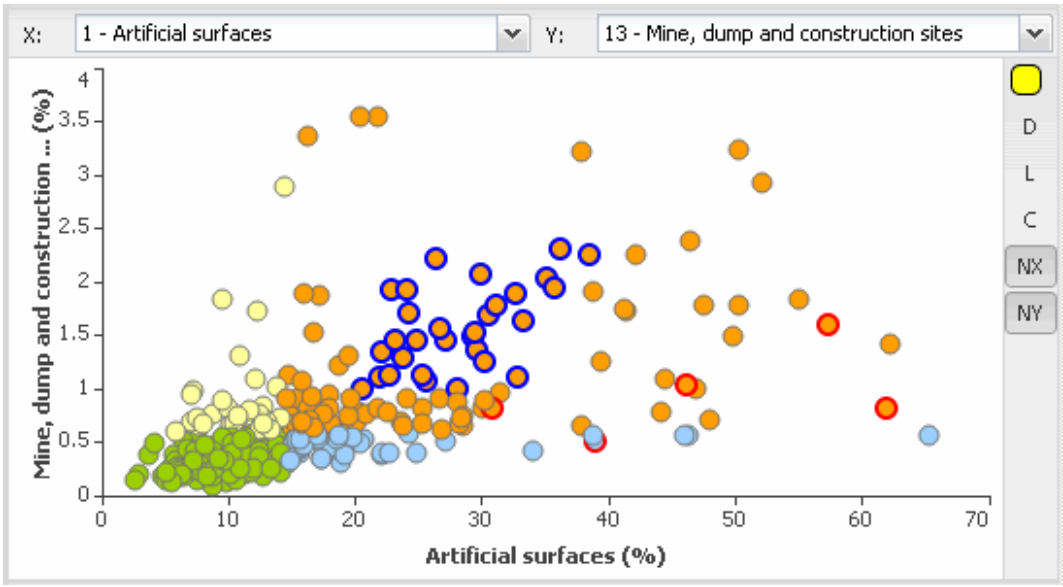


Figure 17. ETMS Data Analysis Tool functionalities: Scatter Chart

Pie chart

Beside these two basic chart types, also use of pie chart – which is appropriate for visualisation of structural indicators, like land cover structure or population age structure – or table, which provide direct access to accurate indicator values - could be considered. These two types of indicator values visualisation would also be fully interactive in sense of unit/indicator or year selection and interconnection with other application components.

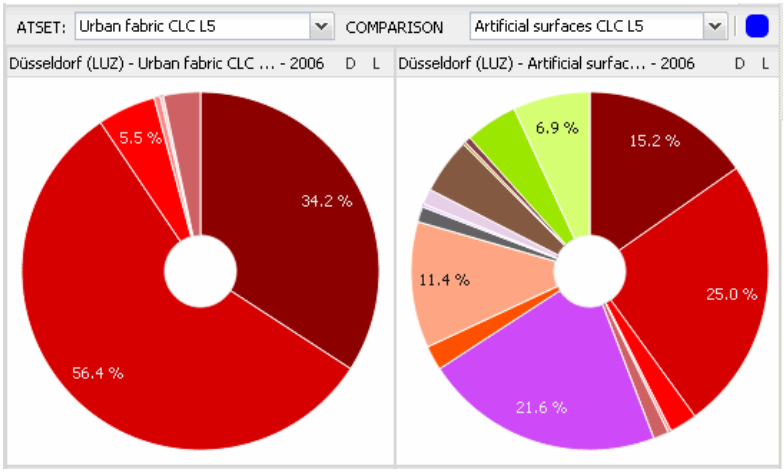


Figure 18. ETMS Data Analysis Tool functionalities: Pie Chart

Tables

The values of analysed indicators can be also displayed via analytical tables. Data could also be downloaded in EXCEL format for user to work on it locally in their computers.

CLC L5 (%) - 2006

ATSET: CLC L5 ATTR: 1 - Artificial surfaces NORM: Artificial surfaces YR TR D

Name	Düsseldorf (LUZ)	Frankfurt (Oder) (LI	Saarbrücken (LUZ)	Barcelona (LUZ)	Le Havre (LUZ)	Budapest (LUZ)	Brescia (LUZ)
11100 - Continuous Urban Fabric (S.L. > 80...	15.17	10.51	9.66	11.95	7.57	17.71	8.56
11210 - Discontinuous Dense Urban Fabric (...	25.03	24.39	30.85	8.95	14.23	30.18	18.82
11220 - Discontinuous Medium Density Urba...	2.44	2.91	10.00	8.13	9.73	7.20	7.00
11230 - Discontinuous Low Density Urban F...	0.266	0.677	0.750	9.69	5.94	1.79	2.87
11240 - Discontinuous Very Low Density Urb...	0.00258	0.00995	0.015	2.00	0.890	0.045	0.816
11300 - Isolated Structures	1.48	0.612	0.955	1.57	3.52	0.406	3.11
12100 - Industrial, commercial, public, militar...	21.64	20.19	17.93	20.37	14.65	16.55	34.84
12210 - Fast transit roads and associated land	2.17	1.32	1.88	2.92	1.14	1.14	0.898
12220 - Other roads and associated land	11.39	10.75	13.74	17.58	14.21	8.58	12.66
12230 - Railways and associated land	1.41	4.24	1.99	1.22	1.70	1.45	0.936
12300 - Port areas	0.304	0	0	0.617	13.21	0.190	0
12400 - Airports	1.37	0	0.344	1.70	0.765	2.02	0.025

Figure 19. ETMS Data Analysis Tool functionalities: Data Tables

6.4 ETMS Facts and Figures Booklet (F&F)

6.4.1 Aim of the F&F

The aim of the F&F (Facts and Figures) booklet is to simple visualization of key statistical features of the ETMS project.

The F&F issues will mainly consist of maps and charts that visualize the indicators that are calculated thanks to the data compiled in the ETMS database. To a lesser extent tables will be included in the F&F Booklet. Texts describing and explaining each figure will generally be short (maximum 4-5 lines for each figure). Although limited in length, these texts should highlight the most notable statistical information provided by the map, chart or table and how they relate to ESPON case studies, policy targets and quality expert discussions.

The F&F issues should thus be easily comprehensible, as they are directed towards policy makers that are looking for information provided at a glance.

Another reason behind this strategy of only providing very short texts and focusing on visual material is that there are other channels to publish more thorough information on the ETMS findings. In the ESPON Evidence Briefs, texts of intermediate length (1-3 pages) could be published together with charts and maps, while the extensive monitoring reports, to be published every 1 or 2 years, and covering approximately 50 pages, will provide a broader and deeper picture of the project.

6.4.2 Publication cycle

The aim is to publish a new F&F issue every 6 months. However, this publishing cycle may vary slightly between the different issues (+/- a few months). By having a flexible publishing cycle rather than strictly keeping to 6 months, it will be easier to keep the F&F issues up to date. For example, if new data of interest for an upcoming issue will be delivered 6.5 months after the last F&F issue, it might be considered better to publish the next F&F issue with that recently released data after 7-8 months rather than strictly keeping to a 6 months schedule.

6.4.3 Themes

Each F&F issue will focus on a specific theme, based on the ETMS key themes, regrouping the COMPASS indicators. There are five such consolidated themes, and each one of these provides the basis for a theme for an F&F issue: Economic competitiveness, Human capital, Social inclusion, Environmental Sustainability and Connectedness. Our suggestion is that the first issue of the F&F Factsheet should consist of a general overview of key features across the 5 COMPASS themes, whereas later issues will each cover only one of these themes. Thematic may be adjusted to the new development of the policy debate, thus making the F&F a flexible dissemination tool for statistical information.

As with the publication cycle, the choice of theme will depend on the data availability. I.e. if there is fresh data collected for a specific indicator, it might be more interesting to create a theme around this recently collected data. Another reason for choosing a certain theme could be that a specific policy debate gets much attention across Europe at the moment when the F&F publishing is due.

There is a possibility to synergize the production of charts and other figures that will be used in the F&F booklet with the GIS environment for the ETMS project provided by GISAT. Through the usage of automated algorithms of data displayed at the ETMS GIS portal, charts and other

figures may be automatically produced by the end-user 'on demand'. Comments and brief data interpretation would then be incorporated by an ESPON Analyst.

6.4.4 Layout and structure

The suggested layout of a typical F&F issue is shown in Appendix "ETMS F&F layout suggestion". Suggestions on which kind of maps, charts and tables to include in the F&F booklet are included in Appendix "Examples of Map, Chart and Table Types to Include in the ETMS Facts and Figures Booklet".

Appendix "ETMS F&F layout suggestion" consists of a typical front page (page 1) and the typical two pages spread (pages 2-3); for subsequent pages (4-5, 6-7…), the same template will be used. Although the layout may be slightly changed between different issues, the suggestion is to stick to the same layout of the all F&F issues, in order to keep a coherent look of the booklet. A standardized layout also smoothen the production of the booklet, as it will be known in beforehand what kind of material (maps, charts, etc) an F&F issue should cover.

The **front page** presents the main story of the chosen theme. Under the headline (in this example named "Monitoring of COMPASS Indicators") there's space for a short introduction to the theme. After that follows a picture or a map – whatever is considered suitable within the given context in order to show the main trend of the specific F&F issue. As this is the front page, a map or picture provide an easier and more attractive entry to the theme of the specific F&F issue than would a more "complicated" chart or figure. In the bottom of the front page are four sections that provide the formal information regarding the data presented in the booklet:

- The Comparability paragraph explains any methodological problems related to comparability of the data included in the F&F issue, for example usage of different data sources for different regions and harmonization issues related to that data.
- The Further Information paragraph contains a literature list and/or links for further information on the theme, for example links to ESPON publications on the matter.
- The Definition paragraph explains definitions used for the data that is presented in the issue.
- The Sources paragraph presents the sources used in the issue.

The typical **two pages spread** consist of four map/charts/tables. As explained above, each map/chart/table is accompanied by a short text.

The map (2 MAP, page 2) is the main feature and covers the major part of the left page of the two pages spread. The map works as an introduction to a broader European, policy relevant perspective of the chosen theme. Generally the map should cover the European continent, with the accompanying text highlighting noticeable spatial trends between different regions. An example of such map is the first figure in the Chapter "Examples of Map, Chart and Table Types to Include in the ETMS Facts and Figures Booklet" of the ANNEX II "Benchmarking Activities".

In the top left corner of the second page of the two pages spread (3 PIE CHART OR TABLE, page 3), the suggestion is to place either a pie chart (or similar chart/figure) or a table of limited size that highlight a specific trend of the given theme. For example, a pie chart here could visualize the developments within the EU in relation to specific typologies, i.e. what is the share of convergence, Transition and RCE regions? For examples of pie chart and a pie chart similar figure, see Figures 3 and 4 in Appendix "Examples of Map, Chart and Table Types to Include in the ETMS Facts and Figures Booklet". A table here could, for example, consist of a top ten list of regions, similar to the "Top Ten Movers" tables in Figure 2 in Appendix "Examples of Map, Chart and Table Types to Include in the ETMS Facts and Figures Booklet". Both pie charts and top ten lists are easy to grasp for the reader.

The top right corner of the second page of the two pages spread (4 CHART, page 3) could be used for smaller bar charts, with maximum 8 classes. For examples, see Figures 5 and 6 in Appendix “Examples of Map, Chart and Table Types to Include in the ETMS Facts and Figures Booklet”.

The bottom half of the second page of the two pages spread (5 TABLE OR CHART, page 3) is aimed for a table or chart that gives – in comparison to the two smaller charts or tables – a more explorative and broader picture to the chosen theme. This part is suitable for a bar chart or plot chart that, for example, could show developments on the national level in comparison with the EU average. For examples, see Figures 7 and 8 in Appendix “Examples of Map, Chart and Table Types to Include in the ETMS Facts and Figures Booklet”.

6.4.5 Suggestion for the first F&F issue

Publishing of the first F&F issue is planned for November 2013. As mentioned above, the suggestion is that the first F&F issue will provide a general overview of the five consolidated COMPASS themes. Theses consolidated COMPASS themes form the basis of the different indicators used within the ETMS project, and their relation to different geographical levels (NUTS0-3, LAU4-5, grids) will be discussed in order to present the changing development trends on different scales.

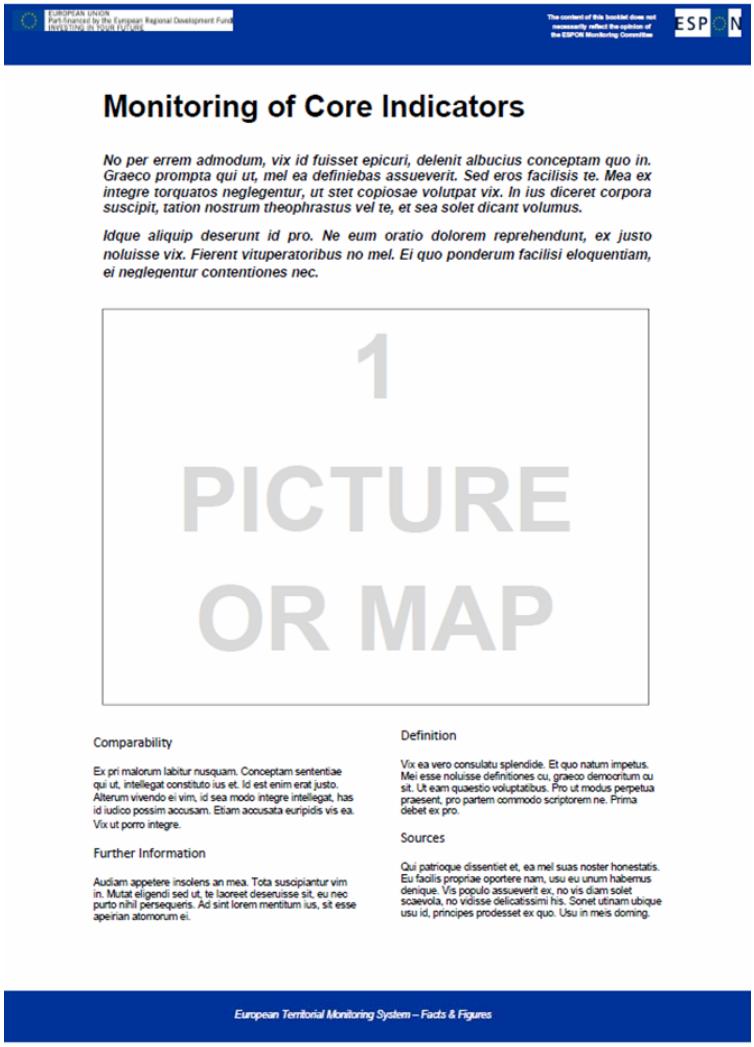


Figure 20. Preliminary mockup of ETMS F&F Booklet. Page 1

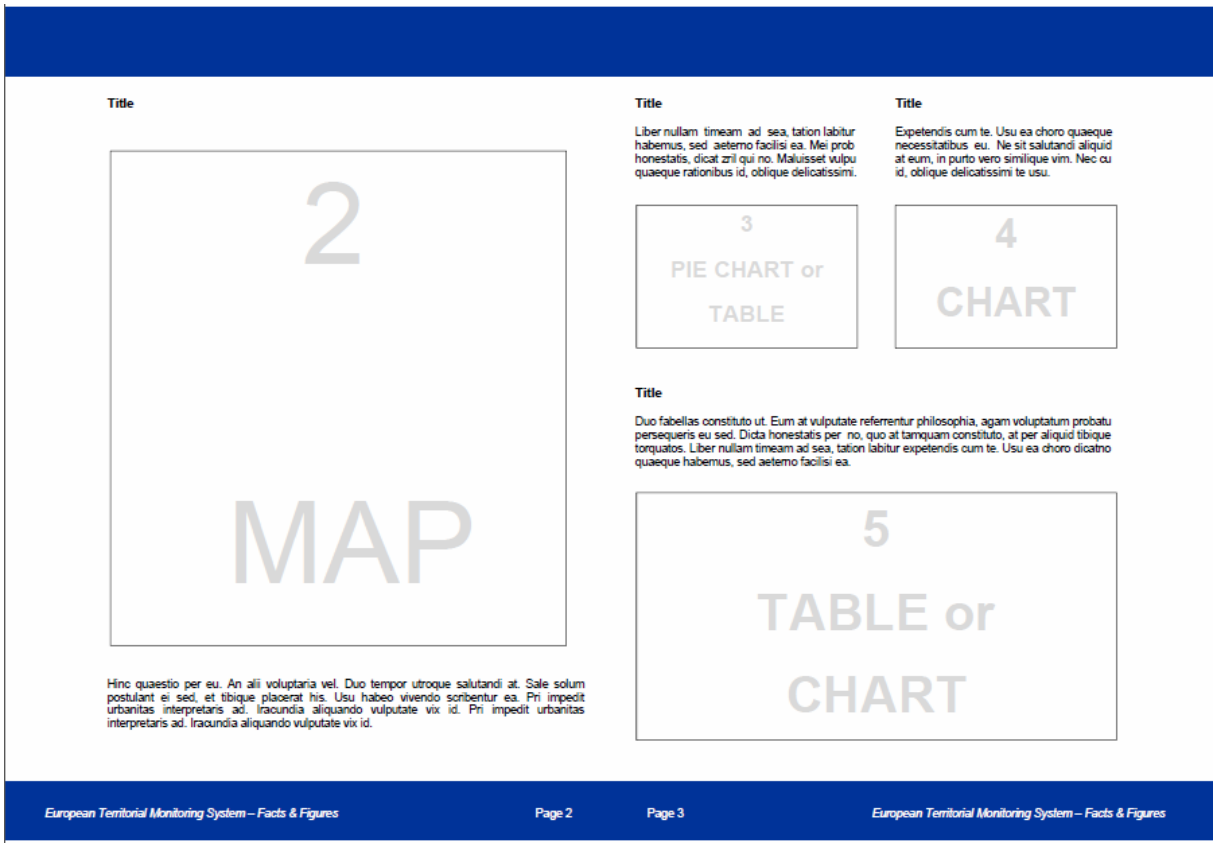


Figure 21. Preliminary mockup of ETMS F&F Booklet. Pages 2 and 3.

6.5 ETMS Monitoring Report

Based on the review of reference Monitoring Reports, a number of lessons and orientations have been identified, and a first sketch for a possible structure for ESPON Monitoring Reports has been developed to initiate the discussion towards the first formal definition of ETMS Monitoring Report, to be delivered to ESPON in November 2013.

Among the key lessons and ideas deriving from the review of Monitoring Reports are:

A. Outspoken Policy Links. Monitoring Reports which aim at informing policy making benefit from a clear link to the policies targeted and an introduction into the policy field which is also appealing to people from other policy fields.

B. Permanent and flexible parts. Some reports have a strong focus on permanent structures and information which are updated every year, whereas others change focus from year to year. However, most appealing it seems to be to have both a permanent part which is updated every time and a flexible part which allows for a new thematic focus for every report.

C. Technical information. Monitoring reports tend to have a strong focus on technical information incl. challenges and approaches as regards methodologies, data sources and even the inclusion of entire data sets.

D. Graphic language. Coherent and comprehensible use of colours in graphics is very important. Furthermore the layout of the graphic should follow the same template to establish a clear identity.

E. Maps, graphs & tables. Monitoring reports are often not so strong on maps but put rather a focus on graphics and table presenting key results and data sets.

F. **Reader friendly.** A reader friendly reporting format is considered to be of particular importance. This includes layout issues (e.g. pages not heavily loaded with text), language (e.g. easy communication language) and structure (e.g. easy to navigate).

G. **Parts & totality.** Some Monitoring Reports are available as full report but can also be downloaded as a collection of freestanding sections or chapters. This makes them attractive as they appear to be more targeted than if it all comes in one heavy report.

A first attempt to translate these lessons deriving from the review of various Monitoring Reports into a proposal for a structure for a ESPON Monitoring Report is presented below. The basic idea is to give the report a fixed structure of six chapters which are strongly related, but could also be seen as standalone documents:

- **Introduction.** The introduction chapter would introduce the aim and specific topic of the report, but also ESPON, and the (definitions) of the most relevant terms used in the report. ***(approx 5 pages)***

- **Highlights/Summary.** The summary chapter would present the main highlights of the report, rather than providing a full summary. ***(approx 5 pages)***

- **Policy Development.** The chapter on policy development, would provide an updated account on (a) developments and debate in European regional and territorial policies, and (b) a more thorough introduction into the policy field(s) related to the specific topic of the report. ***(approx. 5 pages)***

- **ESPON Standards.** This chapter focuses on a number of key themes or indicators which will be part of every ESPON Monitoring Report. So, over time this section would develop into an important reference framework for a limited number of territorial development information and allow seeing changes over time. ***(10 pages)***

- **Thematic focus.** This chapter would introduce the thematic focus of the ESPON Monitoring Report. In the same way as the previous chapter, it would start with an introduction into the field, contain a number of sub-chapters on different aspects of the thematic focus, and round off with a conclusion section. ***(20 pages)***

- **Technicalities.** Last but not least, there would be technical part explaining the most important methods used, the data sources and possible even include information on specific data sets. Depending on the ambitions this can either be a rather extensive annex, or a more concise chapter summarising the most important technical information. ***(5 pages)***

The next figure shows the main chapters and provides also a first picture on possible sub-chapters. Furthermore, it outlines that for the sub-chapters presenting the actual territorial information (i.e. in chapters 4 and 5), there should be a common structure. Each of these sub-chapters should comprise at least a paragraph on the policy context, a text on the most important definitions used, a key map, some graphics based on the data presented, a reading of the map and graphics, references to relevant ESPON case studies and a discussion of the findings presented.

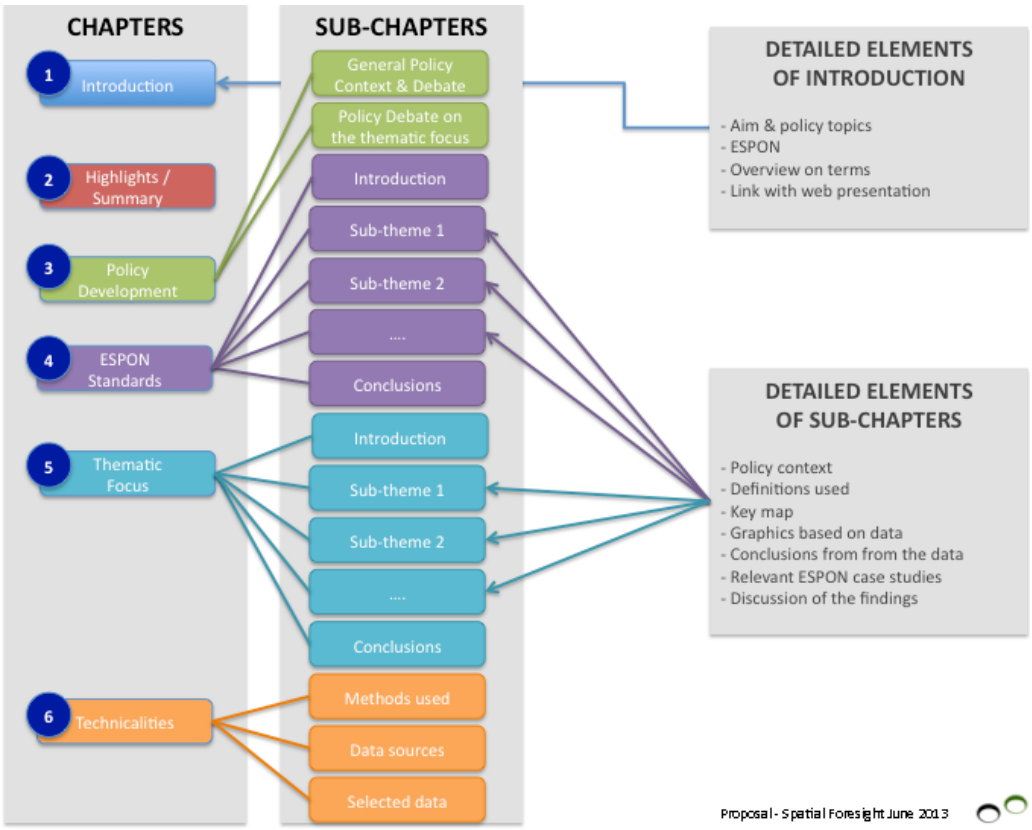


Figure 22. Proposal for an overall structure of ESPON Monitoring Reports

7 ETMS Sustainability

7.1 Approach

One of the intrinsic definitions of a monitoring system is its sustainability over time. Therefore, although the current project will finish in 2014, is should define a procedure to keep the monitoring system alive and updated beyond that date.

The sustainability of the ETMS will be guaranteed by

a) Regular **testing**

b) Comprehensive and consistent **documentation**

c) **Maintenance** and business plans

Therefore, this task is subdivided in three different but related subtasks. The first one is about how a regular testing of the ETMS should be carried out to ensure it runs as it is supposed to. The second subtask defines all the system documentation needs and how this documentation will be safely stored and organised. Finally, the third subtask is about how it should be ensured that the ETMS is maintained over time and, additionally, which services could be produced from it when it is running.

As it can be deduced from the task planning, most of the activities related to this task are better to be carried out once a draft ETMS is built up and running. Therefore, most of the resources have been allocated between March and June 2014.

Anyway, some thinking and small tasks, such as the documentation system set up, have been undertaken already and will be detailed in the following paragraphs.

7.2 Testing

A procedure for the testing of ETMS will be defined when the System is well designed, and should include the review of different aspects:

Technology: the platform should be user-friendly and show reliability and decent speed in different browsers.

Thematic: the indicators within the ETMS should be quality-checked and kept up to date.

Policy relevance: the ETMS should give answer to the currently relevant policy questions, so it should be checked by the different stakeholders (in cooperation with task 2.8).

Once a draft version ETMS is built up, a first testing of the System will be done, following the procedure that will be included in the technical document “Maintenance of the ETMS”, a comprehensive manual which will include testing, quality control and maintenance of the whole system.

The same document should define not only how, but also how often the testing should be undertaken (e.g. every 6 months, yearly…).

The results of each testing will be reported in a standardised document and safely stored in the ETMS documentation system, in the way it is explained in the next section.

The ETMS should be built up in a manner that allows regular updates, as the time component is one of the main ones in a monitoring system. Therefore, the documentation supporting the ETMS

development and testing procedures are a key point in this regard, and should be regularly validated and tested against the system development and its changes.

7.3 Updating and reviewing ETMS documentation

All the documentation relative to the ETMS will be safely stored, and a mechanism of revision and update should be established within the "Maintenance of the ETMS" report. The documentation includes methodological documents, background documents, indicator fact sheets, technical aspects, metadata, and maintenance protocols (see next section).

We have set up a shared documentation system based on open source technology, named Alfresco[11], which is a cloud connected content platform that allows secure file sharing, versioning control, access documents on any device, collaborate on content, automation of processes like document format conversions, etc.

So far, a simple folder structure has been created as follows:

- **Project documents** (to support the project development)
    - Project reports (e.g. Interim report)
    - Working documents
    - Working data
- **ETMS Documentation** (documentation of the System)
    - ETMS Indicators (all the documents related to the selected indicators: metadata, methodologies, related reports, etc.): one folder will be created for each indicator in the ETMS.
    - System reports
    - Maintenance report
    - Business Plan
    - Testing reports

[11] For more references, go to

This is a screenshot of how the ETMS Documentation System looks like in Alfresco:

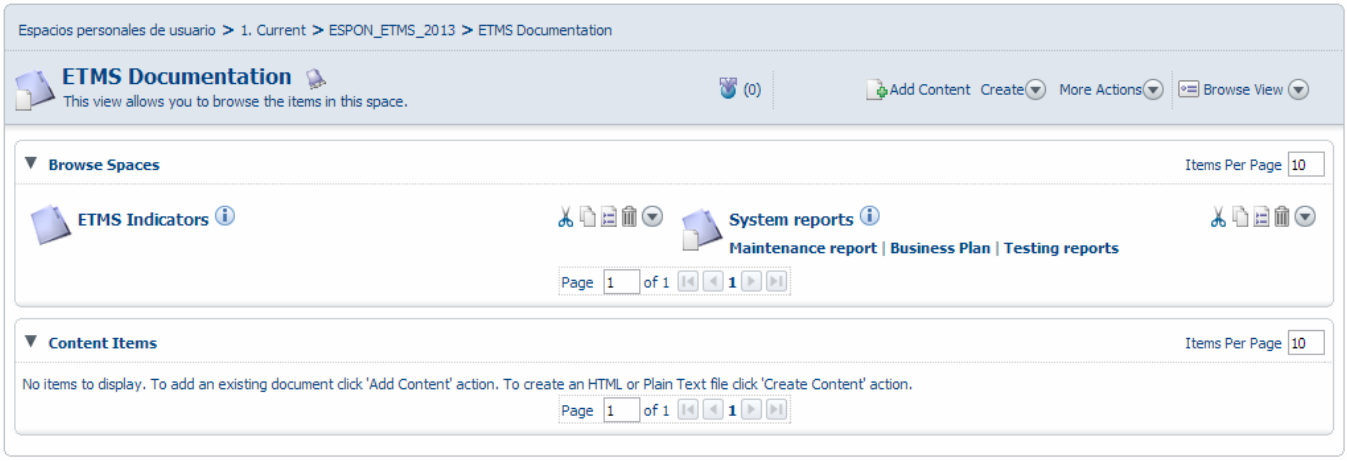


Figure 23. ETMS Documentation System in Alfresco

The next screenshot shows the different set of actions that can be performed for a single document, such as offline editing, updating, downloading, moving, etc. It is also possible to access to older versions of the same document or set up a discussion forum.

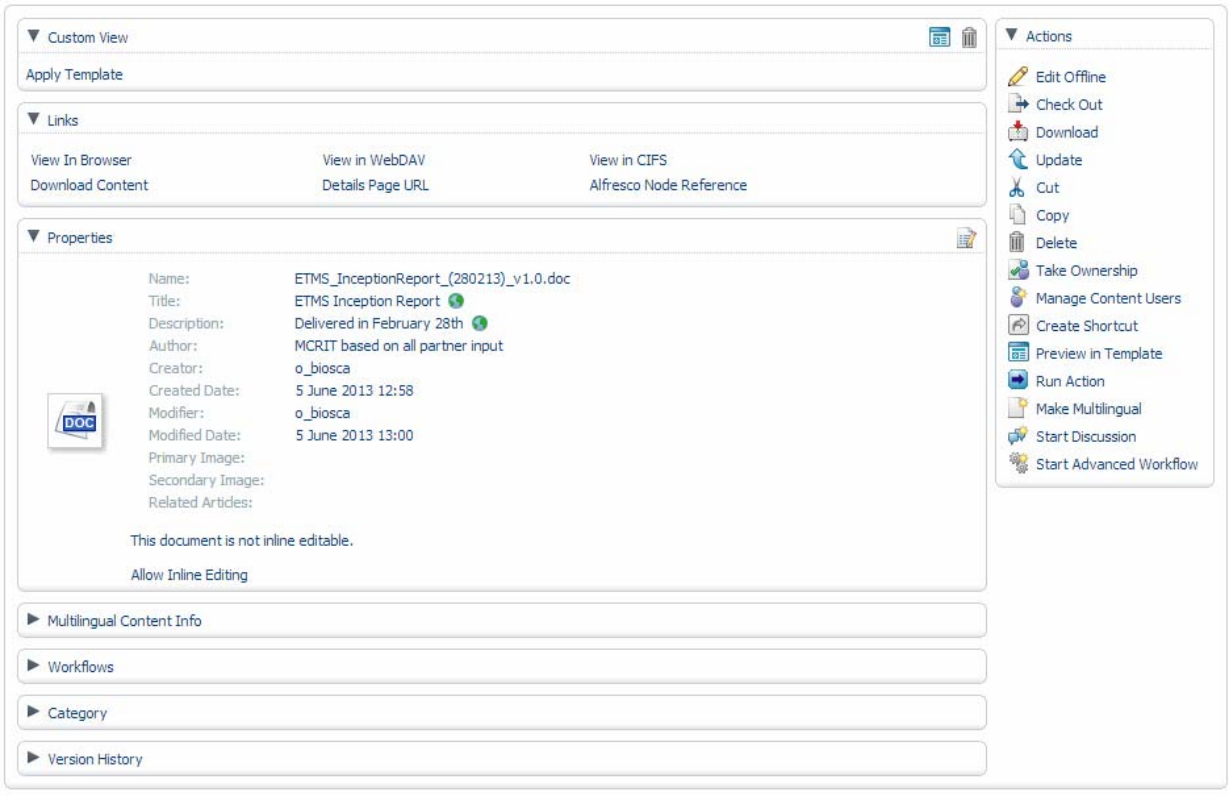


Figure 24. Details page of a single document in Alfresco

7.4 Maintenance Protocol and Business Plan

The maintenance protocol will be defined by means of a “Maintenance of the ETMS” technical report. It will mostly consist on a detailed definition of the indispensable tasks to be carried out to keep the system alive for a number of years, once it is developed. For each task (from software maintenance and database updates to the development and communication of monitoring reports), the specific outputs to be achieved, time and approximate cost will be estimated. It will also include the ETMS testing procedures to regularly verify the good performance of the System.

In parallel to the Maintenance Protocol, a Business Plan report should be developed aiming to identify all kind of useful services and products that can be derived from the system once developed (complementary to the monitoring reports and booklets, e.g. mobile applications), the range of possible users, as well as the public, or private financial support it might need. This information is needed in order to design an ETMS that is feasible overtime (e.g. the development of a Monitoring report may require days, weeks or months of work, depending on how it is designed).

7.5 Expected results

“Maintenance of the ETMS report”. It will be a specific technical document for ETMS maintenance, system testing and quality control assurance. It will be developed while the ETMS is built up, in close relation with task 2.3. It should include, at least:

1. Testing procedure
2. Testing standard reporting document
3. Software maintenance
4. Database update mechanisms
5. Monitoring reporting tasks

Its final draft version should be ready in June 2014.

Business Plan for the sustainability of ETMS: a specific report to be made once the system is designed and a draft version is running.

Its final draft version should be ready in June 2014.

8 Stakeholder Communication

8.1 Identification of relevant stakeholders for discussion on ETMS design

The ETMS aims at reaching a maximum audience of interested groups and individuals and engaging in a useful two-ways communication with them around the key issues highlighted by the ETMS main products, especially the Monitoring report and the Figures and Facts booklet.

The following potential interview partners have been identified and selected on the basis of ensuring a selection of (a) different types of monitoring and (b) different geographical coverage (i.e. Global, European, National).

8.1.1 International Stakeholders

Three international monitoring platforms have been chosen. They are all managed by recognised international organisations, but do cover very different fields, i.e. Economics, Urbanisation and Quality of life. Furthermore, while the Quality of life Index covers a very broad scope of indicators, the two other monitoring platforms are more specialised in their focuses.

More detailed references of these platforms can be consulted in the *"Benchmarking Activities"* section of this report.

OECD Quality of life index
OECD Better Life Index
2 rue André Pascal
75775 Paris Cedex 16
France
bli@oecd.org
Contact : http://www.oecdbetterlifeindex.org/contact/contact-us/

IMF- World Economic Outlook 2013
International Monetary Fund,
700 19th Street,
N.W., Washington,
D.C. 20431
Contact: http://www.imf.org/external/np/exr/contacts/contacts.aspx

UN- World Urbanisation Prospects
Office of the Director
Population Division,
United Nations,
2 United Nations Plaza, Rm.
DC2-1950, New York,
NY 10017
USA
Telephone + 1-212-963-3179,
population@un.org
Contact : http://www.un.org/en/development/desa/population/about/contact/index.shtml

8.1.2 European Stakeholders

Six European monitoring platforms have been identified. All derives from EU institutions or agencies. Even though they are selected with the purpose of covering as broad a field monitoring as possible, avoiding some overlaps are difficult. Therefore linkages and synergies in the handling and usage of the monitoring platforms, could also possible be explored. The functions of the monitoring platforms are though very different. While the Cohesion and PROGRESS reports act as monitoring of the impact of policies, other are merely platforms from which monitoring data are distributed, e.g. INSPIRE Geoportal, Sustainable Development Indicators and to some extent EEAs Environmental Monitoring.

More detailed references of these platforms can be consulted in the *"Benchmarking Activities"* section of this report.

Europe 2020 Monitoring Platform
Committee of the Regions
Bâtiment Jacques Delors
Rue Belliard 99-101, B - 1040 Brussels
Tel: +32 2 282 22 11
https://portal.cor.europa.eu/europe2020/Pages/welcome.aspx

Cohesion Reports
DG Regio (EC)
http://ec.europa.eu/regional_policy/information/reports/index_en.cfm

Sustainable Development Indicators
DG Eurostat (EC)
estat-sdi@ec.europa.eu
http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators

EEA Environmental Monitoring
Kongens Nytorv 6
1050 Copenhagen K
Denmark
Phone: +45 3336 7100
http://www.eea.europa.eu/themes/biodiversity
http://www.eea.europa.eu/themes/air

PROGRESS – Monitoring reports
DG for Employment, Social Affairs & Inclusion (EC)
Unit 01
http://ec.europa.eu/progress

Geoportal for Infrastructure for Spatial Information in Europe (INSPIRE)
Joint Research Centre (EC)
ENV-INSPIRE@ec.europa.eut
http://inspire-geoportal.ec.europa.eu/

8.1.3 National

The inception report identified three national monitoring platforms. Furthermore a fourth national monitoring system has been identified. They are all distinct with regard to how they distribute data, the size of and geographical location of the country. They therefore perform as good representatives for different national monitoring system in Europe.

More detailed references of these platforms can be consulted in the *"Benchmarking Activities"* section of this report.

BBSR (DE)
Helmut Janich
Referat I 6 - Raum- und Stadtbeobachtung
Tel.: +49 228 99401-2258
helmut.janich@bbr.bund.de
http://www.bbsr.bund.de/cln_032/nn_1051708/BBSR/DE/Raumbeobachtung/InteraktiveAnwendungen/interaktiveanwendungen__node.html

Miljoeportalen (DK)
Danmarks Miljøportal
Rentemestervej 8, 1. sal
2400 København NV
T: 7254 5454
E: miljoeportal@miljoeportal.dk
http://arealinformation.miljoeportal.dk/distribution/

Territori (ES)
Cordinators:
George Moses Pinatell
mjordi@iec.cat
Néstor López Cabañas
ncabanes@iec.cat
http://translate.google.es/translate?sl=ca&tl=en&js=n&prev=_t&hl=ca&ie=UTF-8&eotf=1&u=http%3A%2F%2Fterritori.scot.cat%2F

L'Obervatoire des territoires (FR)
DATAR
Observatoire des territoires
8 rue de Penthièvre
75800 PARIS CEDEX 08
Odile BOVAR, conseillère, responsable de l'Observatoire des territoires
Laëtitia FIRDION, chargée d'études statistiques
http://www.observatoire-des-territoires.gouv.fr/observatoire-des-territoires/en/about-us/team

8.2 Interview formats and guidelines

The objectives of the interviews are to:

- Understand the background for the creation of each monitoring system? Who was it initiated by and for what purpose?
- Get an overview of the implementation process leading of the monitoring system. Who was consulted? In was ways? How was the implementation process organised? What were the different profiles/competences of the persons involved?
- Collect information about the technical infrastructure of the monitoring system. What type of technical platform is used? How is the underlying database management system organised? How does the web interface communicate with the database?
- Get information on how the monitoring system is operated and maintained. How many persons-days per year?
- Understand how the background data are compiled and processed. Who are the main primary data providers? How is their provision of data organised? Are there quality control procedures? Are there procedures for the homogenisation of datasets and/or the estimation of missing data?
- What is the target audience? Have there been surveys or enquiries to identify who the actual users are, and how they use the monitoring tool?
- What types of patterns and trends does the system seek to monitor? How are results presented to the users? To what extent does the monitor system function as a platform from which raw data can be downloaded and/or customised indicators can be calculated? To what extent are maps and figures processed and analysed for the user? How are these results presented?
- Does the monitoring system include an online interactive mapping tool? What reasons motivated the inclusion of such a tool in the system?

All aspects are not necessarily equally relevant for all monitoring systems. The questions to be addressed for each may therefore be identified based on a prior assessment of the monitoring system and of documentation on it that may be available online. On this basis, a first overview form the monitoring system will be filled in for each monitoring system, describing the types of information it provides, the nature and characteristics of its web interface, the institutional setting in which it is implemented. In parallel pieces of information pertaining to the questions listed above that can be collected from available documents describing the monitoring system will be collected.

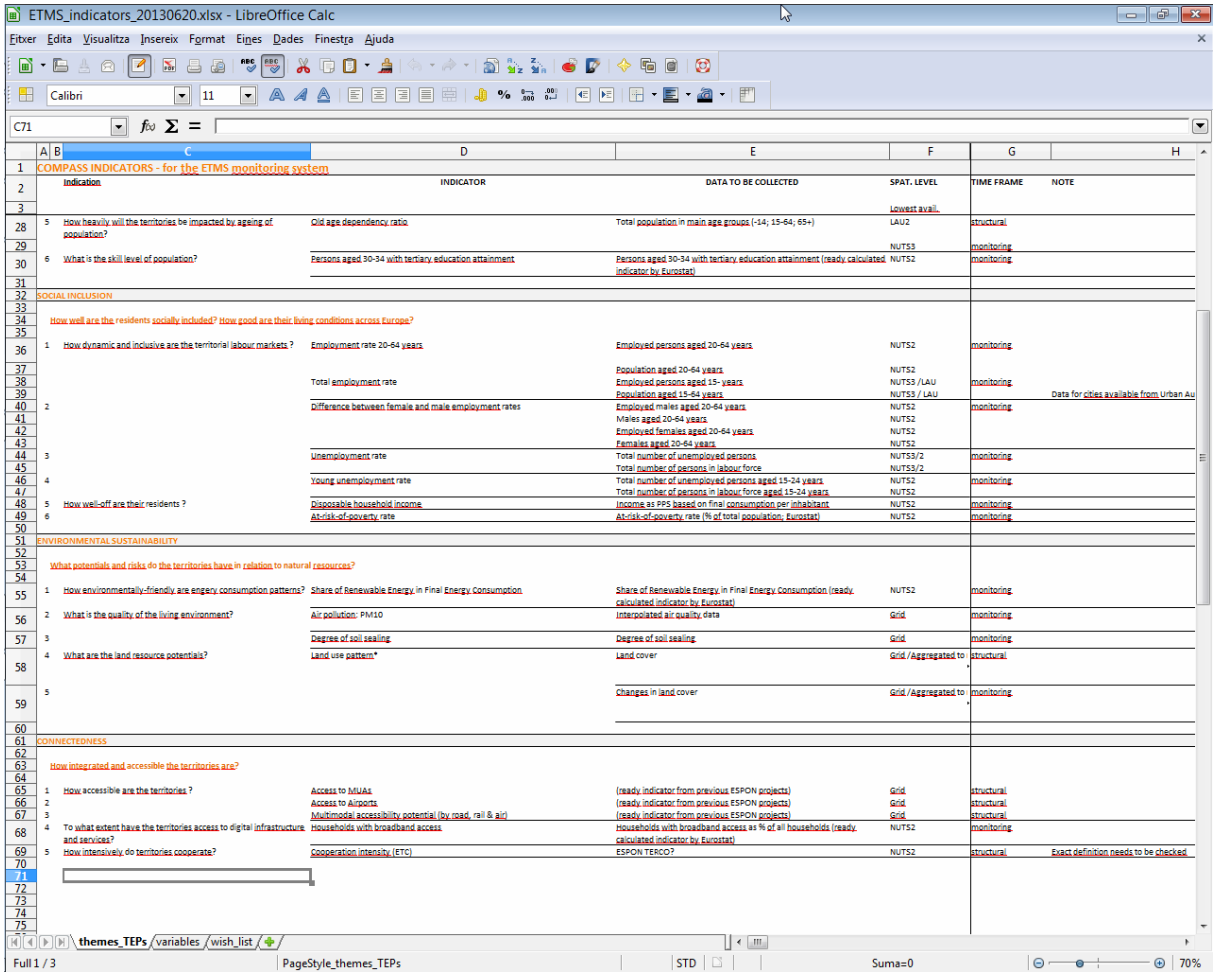
As a second step, contact persons will be identified for each monitoring system. It is possible that more than one person need to be contacted for system. Typically, technical information may not be collected from the same persons as those that can inform the ETMS TPG on the background and objectives of the monitoring system and the process leading to its implementation.

A synthesis of the information from the each interview will be provided, with a focus on elements that may be of concrete use for the design, implementation and operation of the ETMS.

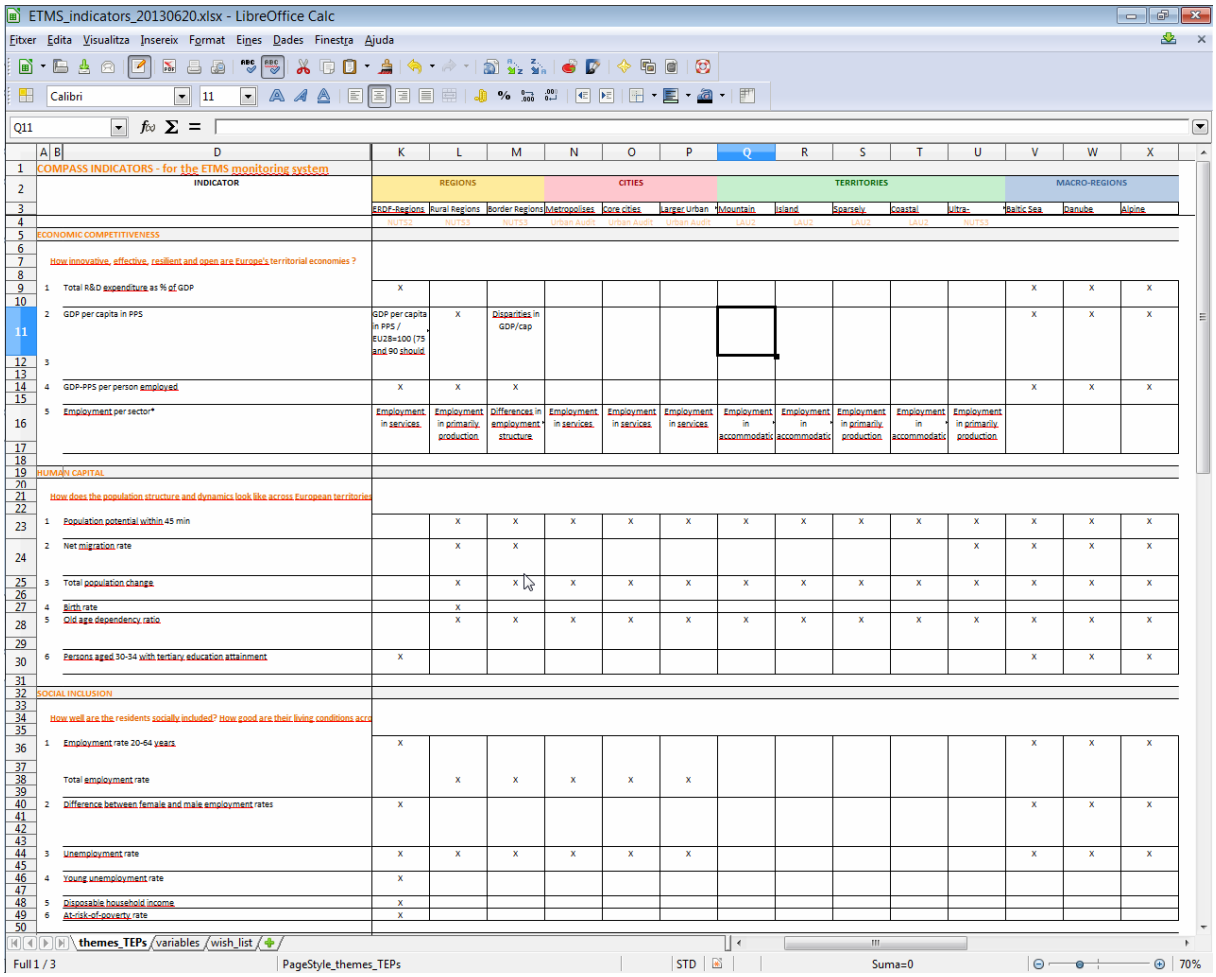
9 ANNEX I – COMPASS Indicators full Excel Proposal

Accompanying this Interim Report, a full Excel spreadsheet is included for full discussion of COMPASS Indicators.

The spreadsheet related key policy questions to COMPASS indicators, and further develop which data will be needed and at which territorial scale for the determination of COMPASS indicators, as shown in the screenshot below.



The spreadsheet then relates each of the COMPASS indicators with the different Territorial Entry-points considered in ETMS, stating which indicators are best suited to monitor specific territorial challenges for the different territorial scales.



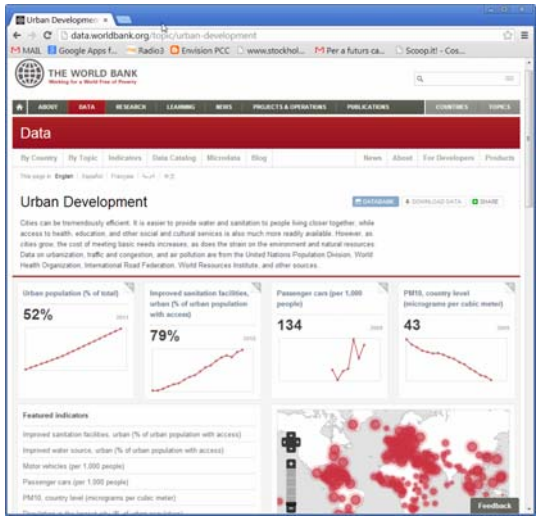
10 ANNEX II – Benchmarking activities

10.1 On the Territorial Monitoring System

The following monitoring platforms have been identified as the ones having potential to act as a source of interesting features and approaches for the design of the ESPON ETMS. They have been further analysed and evaluated. They are all available from the current version of the ETMS website.

Cross Sector Economic Monitor (World Bank). The World Bank is a partnership to reduce poverty and support development. It comprises two institutions managed by 188 member countries (IBRD and IDA). The IBRD aims to reduce poverty in middle-income and creditworthy poorer countries, while IDA focuses exclusively on the world's poorest countries. The Cross Sector Economic Monitor provides a great range of indicators for agriculture and rural development, health, infrastructure, aid effectiveness, climate change, labour and social protection, poverty, economic policy and external debt, education, private sector, public sector, energy, environment, technology, financial sector, social development, habitat development, gender.

http://data.worldbank.org/topic/



Evaluation:

The site provides access to indicators completed in Cross Sector Economic Monitor. It is typical site with multi-entry point approach to the stored data. The user can acces the data sorted by:

- Country
- Topic
- Indicator

This approach should be implemented also in ETMS, because it seems to be the most appropriate way how to structure the data – by topic and by type of territorial unit (in this case represented by countries themselfs).

Indicator values are set into thematic context – their meaning is explained directly on click from each chart, which presents particular indicator.

The portal provides the user realy wide range of information. Which is definitely possitive, however, the information content and especially the approach to it has to be structured carefully in such case. The portal provides both good and bad examples of such "structuring":

- The approach used in entry-approach "**by country**" is very good organised, which could be a template for ETMS portal organisation:
    - for each country, a summary size is prepared, sorted into several main topics
    - each of these topics is described by serveral "key" indicators in charts or maps
    - clicking on each topic, the user can futher explore it in detail within other dedicated site

  This approach of **combination of the quick acces to the most important (or most interesting) information**, which is crucial for most of the common users with the **possibility of detailed analysis** for expert users would be very efficient also for ETMS concept
- In contrast, the approach "**by topic (or theme)** " is not well structure. The first site provides only simple list of topics without any graphics. After selection of particular topic, next site appears which is a bit overloaded with information, which, once again, is not clearly structured.

It could be quite confusing for the user, who aims the particular information. This problem – **overloading with unstructured infromation** - should be definitely avoided in ETMS.

The graphical solution for charts, tables and maps is quite simple but practical and provides a lot of interesting features, most of them concerning the interactive behaviour of charts and maps, which should be valuable inspiration for ETMS Data Analysis Tool. The most interesting of them are listed bellow:

- **interactivity of all incorporated elements** (querying and displaying info on selected unit in chart or map)
- **possibility of interactive customization of charts** (by adding arbitrary unit or category)
- **interconnection of all particular elements** (e.g. selection of any unit in chart induces response in map, etc.)
- interactive switching between graph, table or map visualisation of same indicator (though it is not possible to see more of these elements at once)
- **possibility to enlarge the map window to full-screen mode**
- possibility to detach single element and get its url
- visualisation of trends in tables
- selection of country/unit for analysis by typing the name

However, the portal still shows some weaknesses, which should be avoided in ETMS:

- list of indicators is not further sorted into sub-categories on the summary site for each topic
- some indicators are empty – which is not indicated at indicator selection dialog
- **very slow response** in case of switching between graph, table or chart or selecting indicators
- no interconnection between particular components
- **possibility of multiple unit selection is missing**
- **charts description is not sufficient** (eg. which region is described, missing axis description)
- the **effective graphic** solutions could sometimes be **at the expense of readibility** (eg. dot diagrams in map - cartograms would served better for visualisation of percentual indicators….)
- dialog for adding unit/category into chart – it is not possible to select from the list – you have know the name (at least its beginning of the unit/category and write it into the text box)

Conclusion:

This portal is very interesting as an inspiration for ETMS with a lot of strenghts and interersting feautres and it also provides wide ragne of information.

However, there still occur some weaknesses, which should be avoided in case of ETMS. Most of all a bit confusing environment of the access approach “by topic” and sites for each topic, where too much different type of information is matched into one site. The portal could be better structured in order to become more user-friendly and user-understandable.

IMF Surveillance. (International Monetary Fund). The IMF is mandated to oversee the international monetary system and monitor the economic and financial policies of its 188 member countries. This activity is known as surveillance. As part of this process, which takes place both at the global level and in individual countries, the IMF highlights possible risks to stability and advises on needed policy adjustments. In this way, it helps the international monetary system serve its essential purpose of facilitating the exchange of goods, services, and capital among countries, thereby sustaining sound economic growth.

http://www.imf.org/external/datamapper/index.php

Evaluation:

- The IMF portal provides many kind of information like fast news, actual press releases, highlights and links to reports. There is a link to Data Mapper directly incorporated into the portal, however, the picture with the link does not outstands from other main links, therefore it may be kind of "hidden" for an unexperienced user (see picture bellow).

- the IMF Data Mapper serves as the IMF data visualisation tool. However, it still has the similar design as the IMF portal site, therefore it is clear, that it belongs to IMF. This property should be considered also in case of ETMS and it should be clear from the graphics used for ETMS Data Analysis Tool, that it belongs to ETMS/ESPON activities
- the Data Mapper includes links to datasets, metadata and reports. Also the access to the users forum, which provides important users feedback, is available via direct link incorporated into Data Mapper site. Also this approach should be complied in case of ETMS Data Analysis Tool
- there are separated sites with datasets, metadata or detailed description of indicators, with direct access links interconnected in the Data Mapper. This solution avoid overloading with information.

The tool itself provides an example of a very nice and effective GUI for exploring geo-based data, with lot of interesting and effective features and functionalities, which could improve the overall impression of the tool and user interest into information which is being explored. This fact means that this tool could give a lot of inspiration for ETMS**.**

The main properties or functionalities, which should be followed and their incorporation for ETMS Data Analysis Tool should be considered are as follows:

- the tool is very **well organised, graphically appealing and easy to use**
- map and charts, which can be **visualised in the same time**, are **interactive** and **interconnected** between each other, with impressively **rapid response**
- It provides two different modes "map chart" and "bubble chart" which gives the user possibility to prefer map view or the a view on spatial distribution of indicator values in 2D space. For the "map chart" mode, switching between different view types (map/chart) is included, easily accessible and with rapid response
- also a possibility of switching to **full-screen mode** is available
- selection of the units, which should be added into chart has a very well organized structure of region hierarchy. It is connected with map via zooming (zoom to last selected region), which is very interesting functionality
- unit to be added into chart could be chosen also by clicking in the map
- switching between analysis levels (countries/regions) is enabled with rapid response, realized by both buttons and double clicking on parent unit in chart
- possibility to download data values for selected indicator or graphic elements in png format directly from the tool is included
- bar size is automatically modified depending on number of displayed units
- bubble chart is effective and easy to use, the same can be said about the solution for indicators switching for both x and y axis
- possibility to "PLAY" development, scenarios etc. is incorporated
- possibility to save current settings
- on hand legend and info is available
- information about "no data" is provided for each indicator

One of rare negatives of this application is the worse solution used for navigation through incorporated indicators and their selection. The positive of this navigation menu is quick info on indicators (via hover) when selecting the indicator

Among the negatives, it should be also mentioned, that the tool is maybe too much "GIS like" with minimum analytical information and also minimal control over combinations of themes or indicators, which could be chosen for charts or maps by the user.

This issue should be carefully considered and particular combination of indicators and the type of their visualisation should be discussed not only from technical point of view, but also the ESPON rules and specifics of each theme or region has to be taken into consideration, setting the final appearance and content of the ETMS tool.

OECD Statistics (OECD). The Statistics Portal provides free access to some OECD databases as well as extracts from all other databases, classified by topic (development, economy, environment, society, governance). Both historical data and forecasts are presented, depending on the topics.

http://www.oecd.org/statistics/

Evaluation:

The OECD portal provides wide list of statistics based on extensive database, however, the website is not very well structured and quite confusing for user and is not a good example of how the ETMS portal should look like.

The complete list of key indicators is available for download directly on OECD statistics portal. However, there are sorted only by “key world”, which could be “Africa” or “Agriculture” or “Development” or almost anything else – the system of indicators sorting is not easy to understand. Also graphical solution for this list of indicators is not very good.

Beside it there is also provided link to OECD data lab, which uses the same system for indicators grouping as the list of key indicators for download. Visual representation of each statistic/indicator is solved in a completely different way, which is even more confusing for the user. Moreover – most of indicators are visualised using not very appealing, a bit archaic graphic.

Particular types of charts could give some inspiration, which could be used in ETMS. However, only separated features of them could be called “inspiring” for ETMS, not the portal as a whole.

Regional Innovation Monitor - RIM (EC DG Enterprise and Industry). In the context of the objectives set in the European Commission's Europe 2020 strategy and specifically the Innovation Union flagship action, the Regional Innovation Monitor (RIM) project provides a unique platform for sharing knowledge and know-how on major innovation policy trends in European Union (EU) regions.

http://www.rim-europa.eu/

Evaluation:

The portal provides access to different types of detailed information on regional innovation in 20 European countries. As a simple entry point, list of countries is provided and after selection of one country, an interactive map of selected country appears for the selection of region.

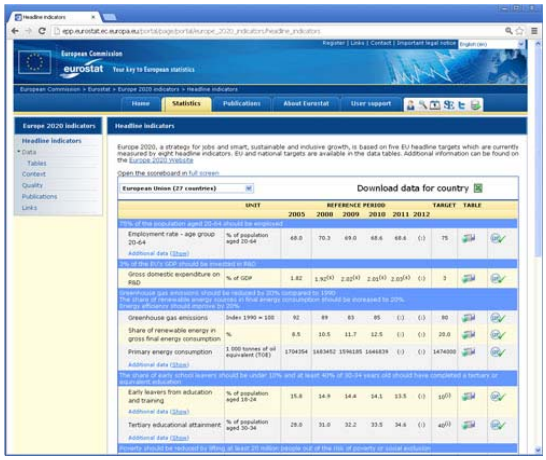
All incorporated information is sorted according to the country or region which they belong to. After selection of the region of interest, short summary regional profile with basic information is prepared, together with links to all relevant information for selected region, including e.g. support measures, policy documents, reports or link to regional organisations for selected country.

Also a simple benchmarking tool for registered users is included into the portal, which enables to compare different regions or years of interest based on user selection.

Comparing with other portals, this one has not much to serve as inspiration for ETMS portal or tool.

Europe 2020 Indicators (Eurostat). In its role of a leading provider of official statistics on the European Union (EU) and in response to the growing interest in data on the Europe 2020 strategy, Eurostat produces and disseminates statistical data to support the strategy. Progress towards the strategy targets is monitored by means of eight headline indicators and three sub-indicators.

http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators



Evaluation:

The portal provides possibility to explore or download headline indicators which are currently used for measuring of five EU headline targets of Europe 2020 strategy at EU27 or country level for different years.

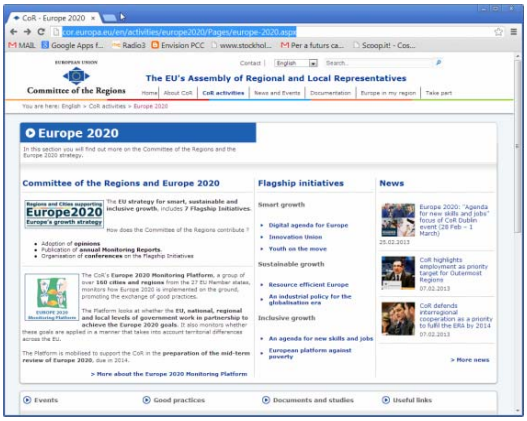
Complete metadata are available for each statistic value or indicator. Also the possibility to explore each statistic value or indicator for all European countries in a table, chart or map is included. The user can choose from nine types of charts and can customize countries and years, which should be displayed. Also the chart symbology can be customized by the user. Possibilities of customization are quite limited for table and map, compared to chart. All elements can be downloaded, including user´ s customization.

The possibility to view more than one type of indicator visualisation (map, chart or table) together in the same time is not included. There is also no interactivity in sense of unit selection or values displaying in map or chart and the graphical solution is rather archaic.

The only inspiration for ETMS which could be given by this portal is the important **possibility to compare indicators/statistical values for more spatial units and more years**.

CoR Europe 2020 Monitoring Platform (Committee of the Regions). The Europe 2020 Monitoring Platform: a network of regions and cities to contribute to the EU debate on smart, sustainable and inclusive growth and to monitor the implementation of Europe 2020. The EUROPE2020MP is the successor to the CoR's Lisbon Monitoring Platform (LMP), set up in 2006 to track the implementation and development of the Lisbon Strategy at the regional and local level

http://cor.europa.eu/en/activities/europe2020/Pages/europe-2020.aspx



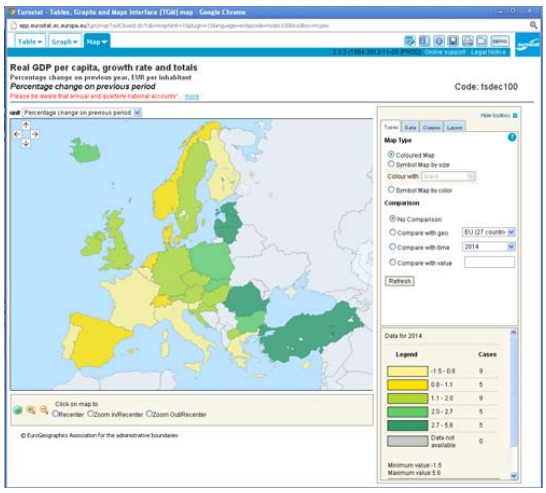
Evaluation:

The portal provides complete information and materials related to Europe2020 strategy, including News and events, Information on Members and stakeholders, Multi-level cooperation or Networks. All incorporated information could be accessed via summary portal, but it is also sorted by country of user´s interest, using “Europe in my region” approach.

Design of the page is simple and provides the user easy and fast orientation in the portal, which could be inspiration for ETMS website. The portal does not include any interactive web tool for visualisation of incorporated information.

Sustainable Development Indicators – SDI (Eurostat). The Sustainable Development Indicators (SDIs) are used to monitor the EU Sustainable Development Strategy (EU SDS) in a report published by Eurostat every two years. They are presented in ten themes. Of more than 100 indicators, eleven have been identified as headline indicators. They are intended to give an overall picture of whether the European Union has achieved progress towards sustainable development in terms of the objectives and targets defined in the strategy. For a more complete picture it is necessary to look at the progress of all indicators within a theme.

http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/indicators



Evaluation:

This portal provides access to values of Sustainable Development Indicators (SDIs) which are used to monitor the EU Sustainable Development Strategy (EU SDS).

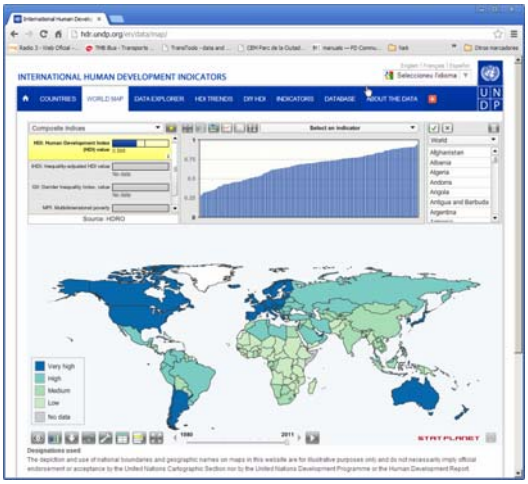
Possibilities for indicators exploring, download and visualisation are very similar to these which are provided by **Europe 2020 Indicators** portal. However, there are already incorporated some advanced functionalities, which improve the overall impression from the data exploring tool. Both chart and map enables the user to view indicator values on mouse hover. Also possibility of map customization is added into this version of application. There occur several interesting features, which should be mentioned separately:

- **possibility to add additional layers into map layout** (e.g. capitals, rivers, hillshade relief)
- **possibility to compare indicator values of each country with value of other single selected country or with values of each country in another year**
- **values sorting in chart (ascending, descending)**
- countries with not available data or gap in time series are highlighted in the map
- maximum and minimum value is calculated and displayed

Especially first tree functionalities from the list could be very beneficial for analysis of geo-based data and their incorporation into ETMS Data Analysis Tool should be considered.

International Human Development Indicators. (UNDP - United Nations Development Programme). The human development data utilized in the preparation of the Human Development Index (HDI) and other composite indices featured in the Human Development Report are provided by a variety of public international sources and represent the best and most current statistics available for those indicators at the time of the preparation of this annual report.

http://hdr.undp.org/en/statistics/



Evaluation:

The portal provides access to eight different tools for data visualisation and analysis. This approach itself is not very good, because it is not obvious, which tool is the most important and which is crucial for analysis. The user should be informed, which mapping tool is the one dedicated for particular portal.

The tool with most interesting solution in relation to ETMS and its Data Analysis Tool purposes - Stat Planet World Map - provides very nice GUI with interconnected map and chart. The layout is customizable – the user can view both map and chart or only one of these elements. Beside it, also the full screen mode is enabled. The tool provides the user a lot of interesting functionalities:

- interactive changing of values in all components (chart etc.) on mouse hover over the relevant unit in map
- displaying of all or selected only units in chart
- sorting of values in chart (ascending, descending, alphabetical)
- displaying of “trendline” in chart
- customization of colour scales used for cartogram
- labeling

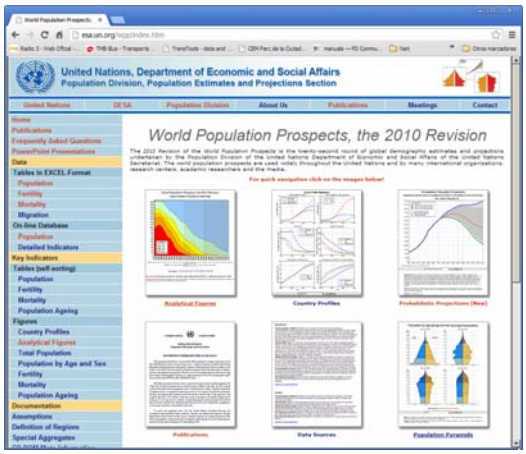
However, considering the purpose of application and the expected user´s experience, there are maybe too much tools and settings included in the application, which could be difficult to understand. Some of bottoms are located without logic, e.g. buttons for customization of the element located in upper right corner of the window is non-logically placed in lower left corner of the window.

The portal provides also country profiles – which include the values and development of the most important indicators completed by basic charts together with short description of the situation in particular country. For more detailed analysis, a link to PDF with detailed description of the situation in each country is provided and also the possibility to download indicators from database in XLS file is incorporated.

Direct links with indicators´ explanations are provided with key worlds in texts on portal sites, which is very on-hand and valuable feature.

World Population Prospects/World Urbanisation Prospects (UNDESA - United Nations, Department of Economic and Social Affairs) The United Nations is an international organization whose stated aims are facilitating cooperation in international law, international security, economic development, social progress, human rights, and achievement of world peace.

http://www.un.org/esa/population/unpop.htm



Evaluation:

This portal provides links for data download or to static charts or tables for particular indicators, which are sorted by their topic. For each country, also a summary "country profile" is prepared, which includes predefined static charts of related indicators.

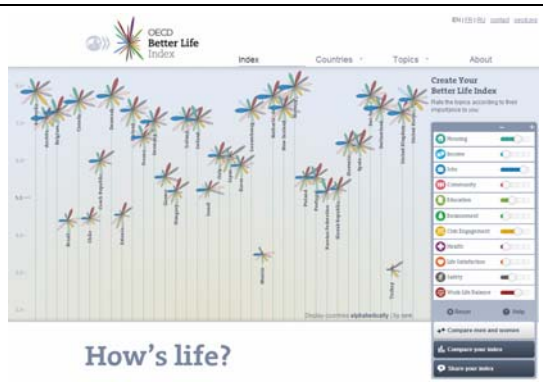
The solution for navigation in the site – realized in the left panel - is rather confusing with links to all types of outputs from XLS tables, on-line database, key indicators, figures to documentation etc. listed on same level, with no grouping based on topic or country.

The user´s customization of the filter for charts returns to default after adding one unit into the chart and all steps have to be repeated – which is time consuming and not user-friendly.

This portal is not a good example for ETMS.

OECD Better Life Index (OECD). The Better Life Index is designed to visualise and compare some of the key factors – like education, housing, environment, and so on – that contribute to well-being in OECD countries. This tool allows the monitoring of the Better Life index, as well as of all indicators used to compute it.

http://www.oecdbetterlifeindex.org/#/13111311311



Evaluation:

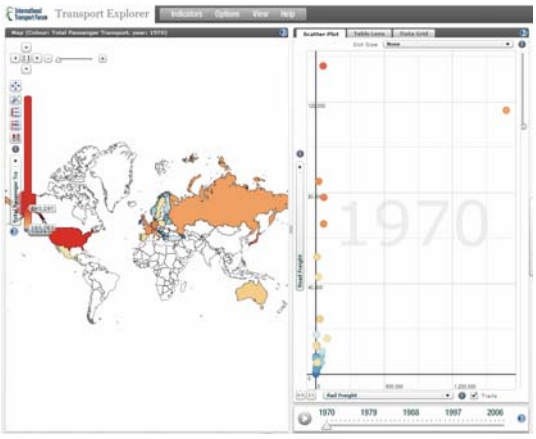
This portal provides an example of highly specific visualisation method designed for specific type of "multi-dimensional" indicator (in this case "better life index"), which is combined from more compounds (which are also indicators itself). It offers an effective way how to visualise and compare values of multi-dimensional indicator for more analytical units. Also a possibility to compare selected unit with other units selected from menu is provided.

This type of visualisation is very interesting, however, it can be used only for this specific type of indicators.

For each compound, textual explanation is provided, which is crucial for correct understanding of the indicator meaning. For each country, short comprehensive "report" is prepared, including values, charts and description of most important indicators and their development.

Transport Explorer (OECD Transport Forum). The International Transport Forum Transport Explorer is an interactive tool that allows users to analyse transport data using an animated graphical or spatial interface. Users can view how indicators evolve over time and examine interrelations between indicators. Users can select colours for indicators in map and scatter plot view and create their own "stories" with animated graphs.

http://webnet.oecd.org/transport%20explorer/

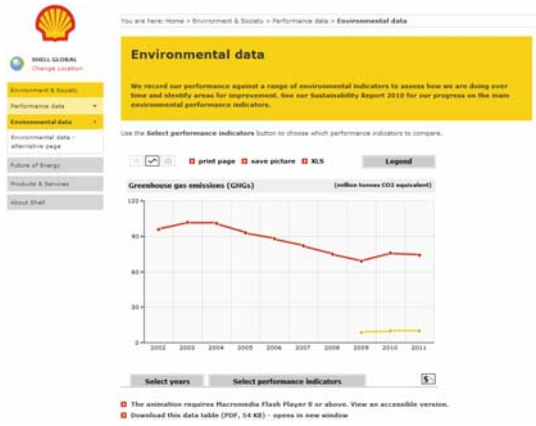


Evaluation:

The portal provides an interesting mapping/charting tool for exploring indicators related with transport. The main negative is that there is no further grouping of indicators, which would definitely help overall readability of the tool. In the map window there is a conflict of map settings frame and legend frame, which cover each other and neither of these components is completely visible. Also some settings are a bit too difficult to understand and not completely intuitive for new users.

On the other hand, there is a possibility to add user´s indicators, which is valuable, however, this functionality is not being planned for ETMS Data Analysis Tool. Also selection of indicators for both axes in the scatter chart is effectively and user-friendly solved.

The most unique feature of this tool is the possibility to **write/add texts directly into the tool interface**, in a dedicated frame for texts. These texts can also be exported and saved. Similar functionality could be considered for ETMS reports generation.

Shell Environmental Data (Shell). Shell records in this platform the company performance against a range of environmental indicators to assess how it is doing over time and identify areas for improvement. http://www.shell.com/global/environment-society/performance/environmental-data.html	

Evaluation:

The Shell Environmental Data portal incorporates only very simple tool for environmental indicators visualization, which, however, is still enough to provide the information, which should be presented to the user. It also provides possibility of direct export of customized chart (selection of indicator and year) or tabular values.

For the ETMS purposes, the tool has not much potential for inspiration.

10.2 On the Territorial Monitoring Report

Following is a review of 7 reference monitoring reports from which inspiration to the suggested outline was found. In particular the parts of the report that was found most appealing are highlighted and when appropriate accommodated by a screenshot.

10.2.1.1 World Urbanization Prospects, 2011 Revision (UNDESA, biannual publication since 1988, latest release August'12)

- Length
  - 318 pages (the main monitoring is 29 pages, the rest is methodology and raw-data).
- Themes covered
  - Urbanisation and natural hazards
  - **Policies** are mentioned rather implicit, and are furthermore not presented in a structured way.
- Structure of report
  - The report is structured with a first chapter containing key findings in relation to urbanization, and a second with a focus on the impact of natural hazards.
  - The structure is not constant from year to year. However they still keep the overall structure of a standard analysis and then a more focus part.
- Elements to highlight
  - First pages with explanation of classifications (e.g. groups of countries, terms like "the more developed regions", abbreviations)
  - Journal style tables

TABLE 4. POPULATION OF URBAN AGGLOMERATIONS WITH 10 MILLION INHABITANTS OR MORE IN 2011 AND THEIR AVERAGE ANNUAL RATES OF CHANGE, SELECTED PERIODS, 1970-2025

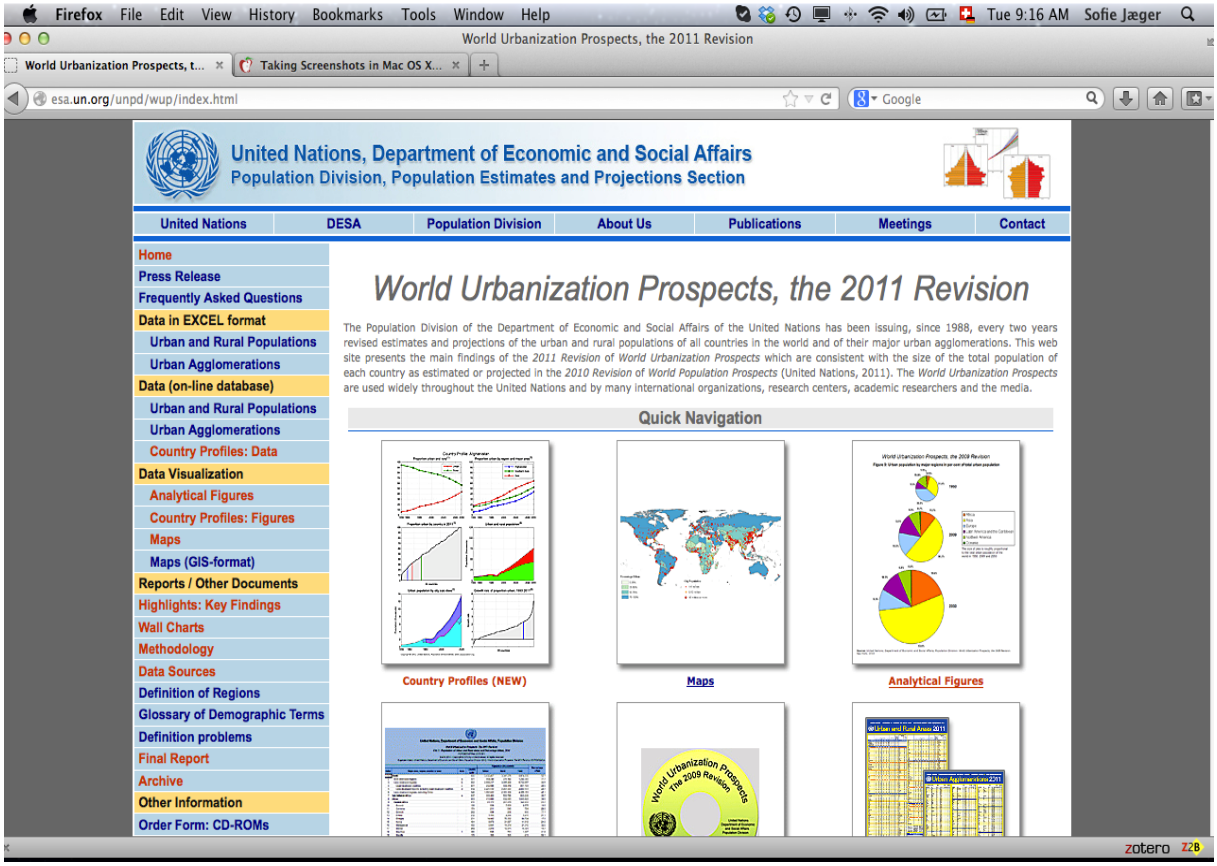
	Population (millions)				*Average annual rate of change (percentage)*		
Urban agglomeration	*1970*	*1990*	*2011*	*2025*	*1970-1990*	*1990-2011*	*2011-2025*
Lagos, Nigeria	1.4	4.8	11.2	18.9	6.08	4.08	3.71
Dhaka, Bangladesh	1.4	6.6	15.4	22.9	7.86	4.02	2.84
Shenzhen, China	0.0	0.9	10.6	15.5	18.44	11.89	2.71
Karachi, Pakistan	3.1	7.1	13.9	20.2	4.15	3.16	2.68
Delhi, India	3.5	9.7	22.7	32.9	5.07	4.03	2.67
Beijing, China	4.4	6.8	15.6	22.6	2.14	3.96	2.66
Guangzhou, Guangdong, China	1.5	3.1	10.8	15.5	3.45	6.01	2.54
Shanghai, China	6.0	7.8	20.2	28.4	1.30	4.52	2.43
Manila, Philippines	3.5	8.0	11.9	16.3	4.07	1.89	2.26
Mumbai (Bombay), India	5.8	12.4	19.7	26.6	3.80	2.20	2.12
Istanbul, Turkey	2.8	6.6	11.3	14.9	4.30	2.58	2.00
Al-Qahirah (Cairo), Egypt	5.6	9.1	11.2	14.7	2.42	1.00	1.98
Kolkata (Calcutta), India	6.9	10.9	14.4	18.7	2.26	1.33	1.87
Ciudad de México (Mexico City), Mexico	8.8	15.3	20.4	24.6	2.79	1.38	1.32
Los Angeles-Long Beach-Santa Ana, USA	8.4	10.9	13.4	15.7	1.31	0.99	1.13
São Paulo, Brazil	7.6	14.8	19.9	23.2	3.31	1.42	1.08
New York-Newark, USA	16.2	16.1	20.4	23.6	-0.03	1.12	1.05
Buenos Aires, Argentina	8.1	10.5	13.5	15.5	1.30	1.20	0.98
Paris, France	8.2	9.3	10.6	12.2	0.64	0.62	0.97
Rio de Janeiro, Brazil	6.6	9.6	12.0	13.6	1.84	1.05	0.93
Moskva (Moscow), Russian Federation	7.1	9.0	11.6	12.6	1.17	1.22	0.56
Osaka-Kobe, Japan	9.4	11.0	11.5	12.0	0.80	0.19	0.33
Tokyo, Japan	23.3	32.5	37.2	38.7	1.67	0.64	0.27

NOTE: Urban agglomerations are ordered according to their projected rate of population change during 2011-2025.

Journal style tables. UN World Urbanization Prospects 2012 Revision

- Online web platform (http://esa.un.org/unpd/wup/index.html)
  - The UN report on world urbanization has a webpage, which presents the report in a comprehensible way.
  - The start page is a Quick Navigation page, from which one can choose a number of quick links to collections of maps, figures, highlights or methodology etc. On the left-hand side a navigation panel is available. The panel consists of links to different selected parts of the report as well as access to full datasets. Of cause the full report is also available for download.

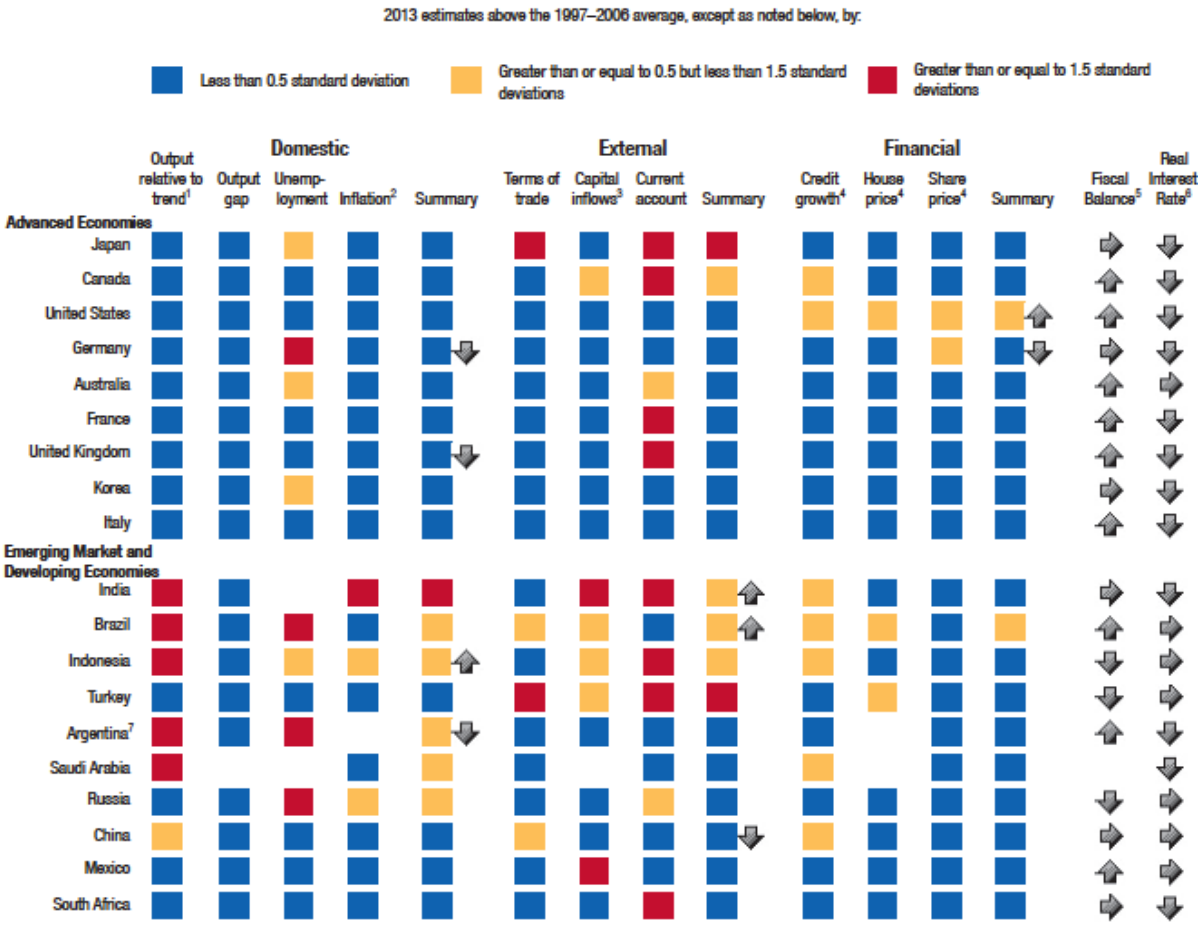
- Even though the navigation could still be improved, the webpage offers a user-friendly way of fast finding the content of interest.



Report as a webpage. UN World Urbanization Prospects 2012 Revision

10.2.1.2 World Economic Outlook (IMF, annual publication since 1980, latest release April 2013 “Hopes, Realities, Risks”)

- Length
  - 204 pages (120 pages monitoring, rest is methodology and data)
- Themes covered
  - Global Prospects and Policies
  - Countries and regional Perspectives
  - The Dog that Didn’t Bark (Inflation)
  - Breaking through the frontier (low-income countries)
  - **Policies**: The development in financial policies is discussed, with relation to the current trends. Policies advice is given as well. This is seen throughout the report.
- Structure of report
  - First two chapters is more traditional monitoring
  - 3rd and 4th chapter is looking at future perspectives and discussion of the current issues.
  - The structure stays the same as in previous reports
- Elements to highlight
  - The division of content between the two sections (standard part and changing themes).
  - Overheating indicators on p. 10 (figure 1.9)



Overheating indicators. IMF World Economic Outlook

ing. However, the passage of a new stimulus equivalent to about 1½ percent of GDP during 2013–14 eases the fiscal stance moderately this year. The deficit will remain close to 10 percent of GDP for the fifth straight year, but is expected to improve markedly in 2014 with the unwinding of the stimulus and reconstruction spending and the planned consumption tax increase in April to 8 percent from 5 percent. What is worrisome is that the debt-to-GDP ratio will continue to rise, reaching 255 percent of GDP in 2018.

- U.S. fiscal policy is assumed to tighten by about 1¾ percent of GDP, which is ½ percentage point of GDP more than in 2012, largely reflecting the budget sequester. The deficit will then still exceed 5 percent of GDP in 2014, and the public debt ratio will stand at about 110 percent. The forecast assumes that the debt ceiling is raised and that the budget sequester is replaced at the end of the current fiscal year with back-loaded measures.
- In the euro area, deficits have already been reduced much more than in Japan or the United States, and the pace of consolidation will drop to ¼ percentage point of GDP in 2013, from a little less than 1½ percentage points in 2012. In particular, Germany will shift from structural tightening to slight loosening, and Italy will tighten by about 1 percent of GDP, down from 2¼ percent. Periphery economies continue to face a dangerous combination of low growth, high interest rates, high deficits, and high debt. In the United Kingdom, fiscal consolidation is now forecast to be slower than was anticipated previously.

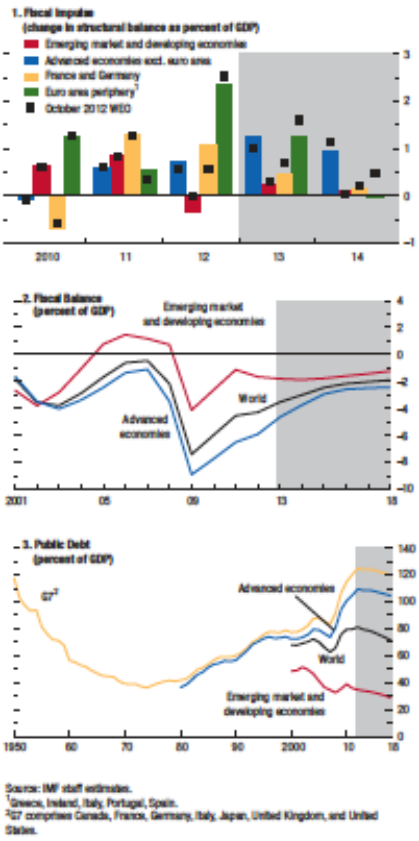
In emerging market and developing economies, fiscal policy is expected to remain close to neutral. Elevated growth will push debt ratios farther down, to 30 percent of GDP by 2018. However, some countries continue to face significant fiscal challenges—for example, Middle Eastern oil importers with high energy subsidy spending, several emerging European economies, and India.

Global Growth Is Projected to Continue to Rise Gradually

World growth hit a trough at about 2¼ percent in the second quarter of 2012 and reached 2¾ percent in the second half of the year. Leading indicators point to accelerating activity (Figure 1.1, panel 3; Figure 1.2, panel 1). Real GDP growth is forecast to reach 3¼ percent on an annual average basis in 2013 and

Figure 1.7. Fiscal Policies

Fiscal policy will remain tight in advanced economies and broadly neutral in emerging market and developing economies. The pace of tightening will drop noticeably in the euro area during 2013–14. In advanced economies, debt ratios are forecast to stabilize soon but rise again in the medium term because of entitlement spending. In emerging market and developing economies, debt ratios are projected to continue to decline because of strong growth and low interest rates.



Source: IMF staff estimates.
[1]Greece, Ireland, Italy, Portugal, Spain.
[2]G7 comprises Canada, France, Germany, Italy, Japan, United Kingdom, and United States.

Layout and graphics. IMF World Economic Outlook

10.2.1.3 Human Development Report 2013 (UNDP, annual publication since 1960, latest release April 2013 “The Rise of the South, Human progress in a Diverse World”)

- Length
  - 216 (130 pages of monitoring, rest data and methodologies)
- Themes covered
  - State of human development
  - A more global south
  - Drivers of development transformation
  - Sustaining momentum
  - Governance and partnerships for a new era
  - Policies are widely mentioned, however as human development is a rather broad theme, an exhausted and structured overview is not found.
- Structure of report
  - First two chapters focus on the current trends
  - Third chapters describe drivers
  - Then future perspectives and development advice
  - The previous and current reports don’t seem to follow the same structure. However the last chapter is in most reports forward looking and offers advice to future development and policies. Nevertheless the layout remains stabile in time.
- Elements to highlight
  - Changing focus from year to year. In particular this is used in a smart way in the beginning with an overview of previous years focuses. This gives an idea of the changing focuses and development trends in a long-term perspective.
  - Very simple and clean graphical look
  - Small boxes with cases

BOX 5.2 *Jo Leinen, Member of the European Parliament*

A world parliament for global democracy?

Legitimacy and representativeness of the world's people in global decisionmaking are imperative for the governance of global issues, but global decisionmaking bodies have no institutional mechanisms for effective and influential citizen participation. At a time when intergovernmental decisionmaking has shown its limits, the quest for equity and sustainability and the urgency of addressing defining challenges for our planet require the engagement of the global citizenship.

A world parliament would complement the United Nations General Assembly—either formally integrated in the UN system or instituted as a separate body. This idea is not new, but as it matures, it is receiving increasing support from civil society actors and regional parliaments (including the European, Latin American and African Parliaments) and was recently highlighted in the Manifesto for Global Democracy put forward by a multinational group of intellectuals.[1]

A world parliament would be composed of delegates from national parliaments, representing multiple political parties from each country. Since the great majority of national parliaments are democratically elected, such a body would have a high level of representativeness and political accountability. A world parliament would serve as a link between national policymaking and global decisionmaking, providing incentives for national parliaments and governments to consider the implications of decisions beyond national borders and instilling national parliaments with knowledge and experience on governing global issues.

This assembly could have one extended annual session, during which it would issue recommendations and add agenda items to the UN General Assembly and, by a qualified majority, submit agenda items to the UN Security Council for debate and decisions. The deliberations would possess a high moral and political authority, although the final decisionmaking power would remain with national governments. The composition of each national delegation could be determined either by national parliaments or through special elections allowing citizens to choose representatives for the world parliament. Delegation size would be proportional to a country's population, an approach considerably different from international bodies where voting quotas are based on monetary contributions.

1. Beaton 2012.

international governance. The World Health Organization, for example, has had to manage state interests carefully and adjust to the emphasis on privatizing health services that became dominant in the 1980s. Its core commitments to public health and its ties to civil society, however, have enabled it to continue to pursue policies that emphasize a rights-based approach to health.[10]

Towards coherent pluralism

The challenge facing the multilateral system is not a false choice between older structures devised by the North and newer arrangements responding to the needs of the developing world. It is integrating, coordinating and in some cases reforming these institutions so that they can work more effectively together

The challenge facing the multilateral system in response to the rise of the South is not a false choice between globalism and regionalism or between older structures devised and managed by the traditional powers of the North and newer arrangements responding to the needs of the developing world. Rather, it is integrating, coordinating and in some cases reforming these institutions so that they can all work more effectively together. Diversity and flexibility in global governance mechanisms can be net positives for the international system but cannot substitute for the global pursuit of solutions to problems that are inherently global in nature. Policymakers working both regionally and internationally should strive towards a more coherent pluralism in multilateral governance, with shared norms and goals supporting varied yet complementary regional and global development initiatives.

Recent experience in much of the South has shown that some public goods can be effectively provided at the regional level. As noted in chapter 2, regional institutions can sometimes respond to regional needs faster and more efficiently than can global forums—for example, programmes for eradicating endemic diseases, protecting shared ecosystems and removing barriers to intraregional commerce. In such cases, it makes sense for like-minded neighbouring states to address these challenges cooperatively while pursuing global responses to these issues where needed.

Increasing regional cooperation can also have disadvantages—adding further complexity to an already diverse array of multilateral institutions, with all the attendant risks of exclusion, duplication and interagency competition. In many areas, regional institutions have the potential to complement global structures, even if that kind of coordination seems rare or inadequately synchronized today.

Global governance arrangements must respect the mixed strategies that countries are choosing. It is clear that developing and emerging economies are choosing to cooperate in different ways—bilaterally, regionally

112 | HUMAN DEVELOPMENT REPORT 2013

Example of layout. UNDP Human Development Report

10.2.1.4 Global Report 2011 (CSP - Center for Systemic Peace, biannual publication since 2007, latest release December 2011 “Conflict, Governance and State Fragility”)

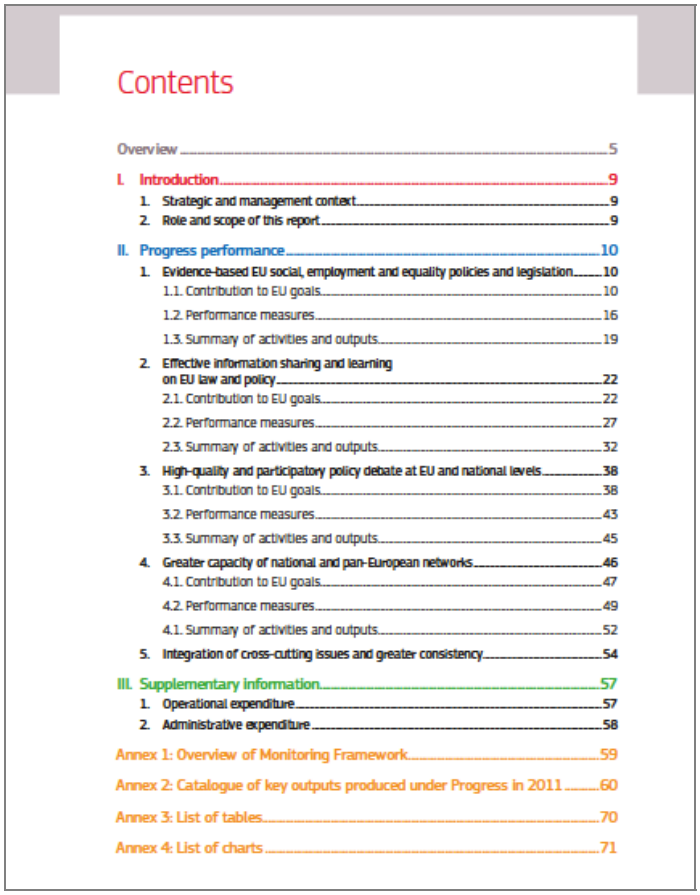
- Length
  - 44 pages
- Themes covered
  - Conflict and state fragility
- Structure of report
  - The report covers several dimension (Conflict, governance, development) and in the end summarize these dimensions in a global state fragility index
- Elements to highlight
  - Even though the report appears a bit unstructured (e.g. lack of index), we like the idea of their fragility index, as is a nice way of summarizing the report.

	Fragility Index	Effectiveness Score	Legitimacy Score	Security Effectiveness	Security Legitimacy	Armed Conflict Indicator	Political Effectiveness	Political Legitimacy	Regime Type	Economic Effectiveness	Economic Legitimacy	Net Oil Production or Consumption	Social Effectiveness	Social Legitimacy	Regional Effects
El Salvador	5	2	3			*			DEM			+			
Macedonia	5	3	2						DEM			+			
Malaysia	5	1	4						DEM			1			Mus
Oman	5	2	3						AUT			91			Mus
Albania	4	3	1			*			DEM			+			Mus
Bahrain	4	0	4						AUT						Mus
Belarus	4	3	1						AUT			+			
Jamaica	4	2	2						DEM			+			
Mexico	4	1	3			War			DEM			3			
Panama	4	0	4			*			DEM			X			
Romania	4	1	3			*			DEM			+			
Trinidad	4	0	4						DEM			28			
Botswana	3	2	1						DEM			+			Afr
Cyprus	3	0	3						DEM			X			
Kuwait	3	0	3			*			AUT			267			Mus
Montenegro	3	3	0						DEM			+			
United Arab Emirates	3	0	3						AUT			176			Mus
United States	3	2	1			War			DEM			X			
Australia	2	0	2						DEM			+			
Belgium	2	0	2						DEM			X			
Bulgaria	2	1	1						DEM			+			

Fragility index. Global Report

10.2.1.5 Progress Annual Performance Monitoring Report 2011 (EC PROGRESS, annual publication since 2007, latest release 2012 "Monitoring of the performance of the European Union programme for employment and social solidarity")

- Length
  - 76 pages (50 pages of monitoring)
- Themes covered
  - Policies and legislation
  - Information sharing and learning on EU law and policy
  - High-Quality and participatory policy debate at EU and national levels
  - Capacity of networks
  - Integration of issues
  - Policies: The report monitors the performance of this particular programme, which is why it focuses a lot on policies related thereto.
- Structure of report
  - All chapters deal with one aspect of the programme. All chapters follow the same logic:
    i. First outlining the progress in terms of the programmes goals
    ii. Review of performance in relation to the concrete defined measures
    iii. More detailed information about outcomes delivered because of the programme
  - The reports from previous years follow the same structure.
- Elements to highlight
  - Very clear structure
  - Nice graphic, helps to navigate in the report



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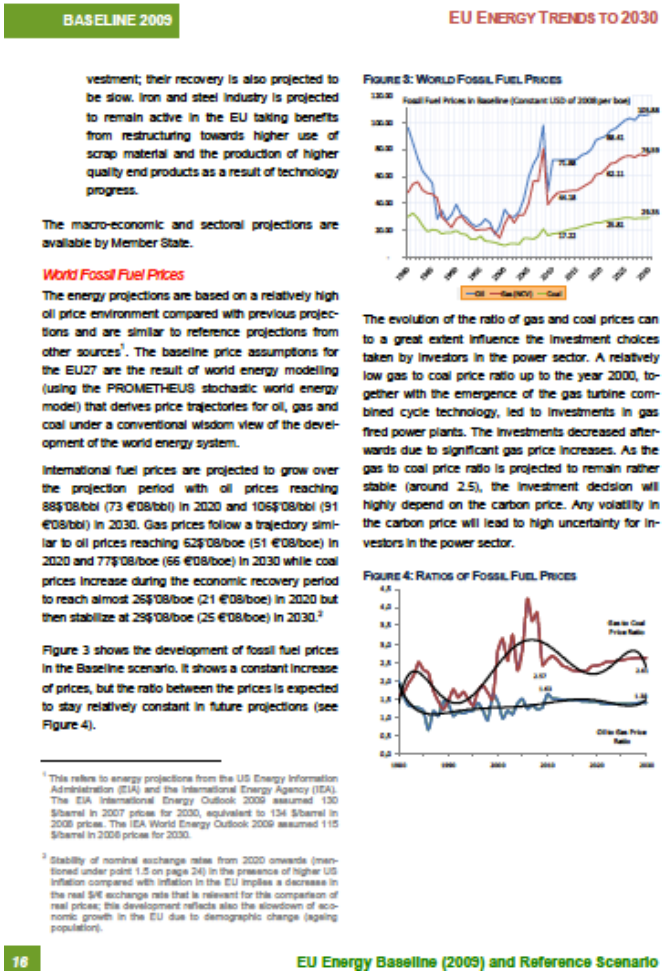
Example of layout. PROGRESS – Annual performance monitoring report

10.2.1.6 EU Energy Trends to 2030 (EC DG Energy, biannual updates since 2003, latest release August 2010 “Update 2009”)

- Length
  - 184 pages (50 pages of monitoring, rest data and methodology)
- Themes covered
  - A baseline scenario (including underlying assumptions and results of the scenario)
  - A reference scenario (including assumptions and results)
  - Implications for Energy consumption, powers generation, primary energy supply and Emissions & RES Indicators
  - Policies as the scenarios is based on both policies and regulations, the report has an overview of legislation in this field, as well ass it discusses the impact of different polices.
- Structure of report
  - The two main chapters (one for each scenario) have the same structure; assumptions and drivers and results of the scenario.
  - The report has a general conclusion in the end.
  - The structure is based on the scenarios, which have been developed throughout the previous reports. Therefore it is a rather dynamic structure, in which however continuity is seen.
- Elements to highlight
  - Structure of the report is clear and logic
  - A small glossary in the end
  - The use of color works well



BASELINE 2009

EU ENERGY TRENDS TO 2030

vestment; their recovery is also projected to be slow. Iron and steel industry is projected to remain active in the EU taking benefits from restructuring towards higher use of scrap material and the production of higher quality end products as a result of technology progress.

The macro-economic and sectoral projections are available by Member State.

World Fossil Fuel Prices

The energy projections are based on a relatively high oil price environment compared with previous projections and are similar to reference projections from other sources[1]. The baseline price assumptions for the EU27 are the result of world energy modelling (using the PROMETHEUS stochastic world energy model) that derives price trajectories for oil, gas and coal under a conventional wisdom view of the development of the world energy system.

International fuel prices are projected to grow over the projection period with oil prices reaching 88$'08/bbl (73 €'08/bbl) in 2020 and 106$'08/bbl (91 €'08/bbl) in 2030. Gas prices follow a trajectory similar to oil prices reaching 62$'08/boe (51 €'08/boe) in 2020 and 77$'08/boe (66 €'08/boe) in 2030 while coal prices increase during the economic recovery period to reach almost 26$'08/boe (21 €'08/boe) in 2020 but then stabilize at 29$'08/boe (25 €'08/boe) in 2030.[2]

Figure 3 shows the development of fossil fuel prices in the Baseline scenario. It shows a constant increase of prices, but the ratio between the prices is expected to stay relatively constant in future projections (see Figure 4).

FIGURE 3: WORLD FOSSIL FUEL PRICES

The evolution of the ratio of gas and coal prices can to a great extent influence the investment choices taken by investors in the power sector. A relatively low gas to coal price ratio up to the year 2000, together with the emergence of the gas turbine combined cycle technology, led to investments in gas fired power plants. The investments decreased afterwards due to significant gas price increases. As the gas to coal price ratio is projected to remain rather stable (around 2.5), the investment decision will highly depend on the carbon price. Any volatility in the carbon price will lead to high uncertainty for investors in the power sector.

FIGURE 4: RATIOS OF FOSSIL FUEL PRICES

[1] This refers to energy projections from the US Energy Information Administration (EIA) and the International Energy Agency (IEA). The EIA International Energy Outlook 2009 assumed 130 $/barrel in 2007 prices for 2030, equivalent to 134 $/barrel in 2008 prices. The IEA World Energy Outlook 2009 assumed 115 $/barrel in 2008 prices for 2030.

[2] Stability of nominal exchange rates from 2020 onwards (mentioned under point 1.5 on page 24) in the presence of higher US inflation compared with inflation in the EU implies a decrease in the real $/€ exchange rate that is relevant for this comparison of real prices; this development reflects also the slowdown of economic growth in the EU due to demographic change (ageing population).

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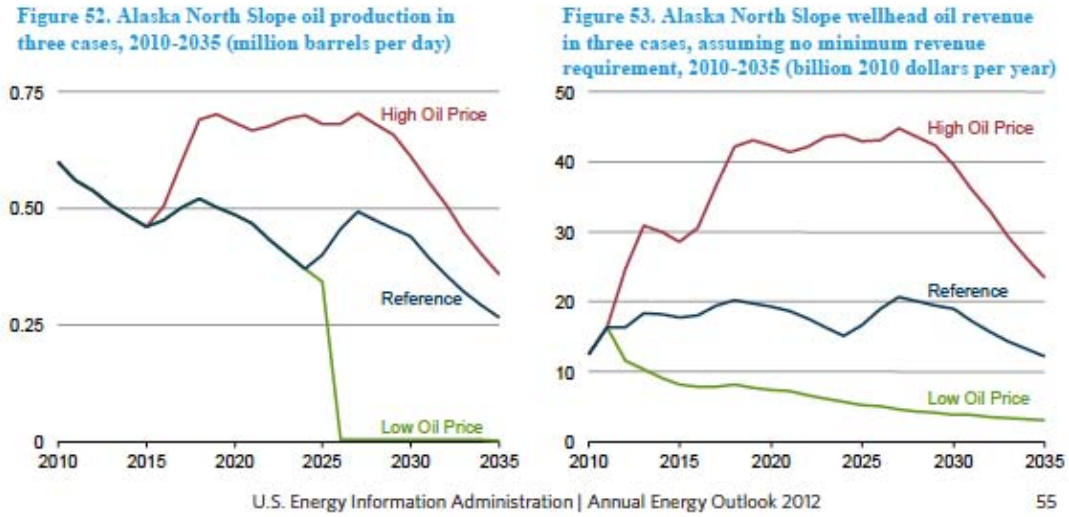
EU Energy Baseline (2009) and Reference Scenario

Example of layout. EU Energy trends to 2030

10.2.1.7 Annual Energy Outlook 2013 (US Energy Information Administration, annual publication since 1979, latest release April 2013)

- Length
  - 246 pages (monitoring content 100 pages, rest data and methodologies)
- Themes covered
  - Legislation (in relation to regulation of the energy market)
  - Main issues in focus (this is topics of special interest)
  - Market trends (demand, prices, supply for different energy sources)
  - Comparison with other projections (i.e. other monitoring reports)
  - Policies: Changes in policies and legislation is covered in the first chapter, but further elaborated on policies and their impact is seen in the following more focused sections.
- Structure of report
  - First an overview of changes in legislation and special things to consider is seen. Both for all of the US, but also for the individual states
  - A focus on issues, which are of importance at the current time and for the energy market (e.g. changing structures of industries, uncertainties on energy resources etc.)
  - Trends in the markets (Including projections on demand, supply and capacity)
  - And then a comparison and reflection upon other projections of energy demand, supply and capacity.
  - The structure remains the same from year to year.
- Elements to highlight
  - Easy to read graphs
  - Comparison with other projections in the last chapter.



Graphs from the report. US annual Energy Outlook

10.3 Facts and Figures Booklet. Reference examples of Map, Chart and Table Types

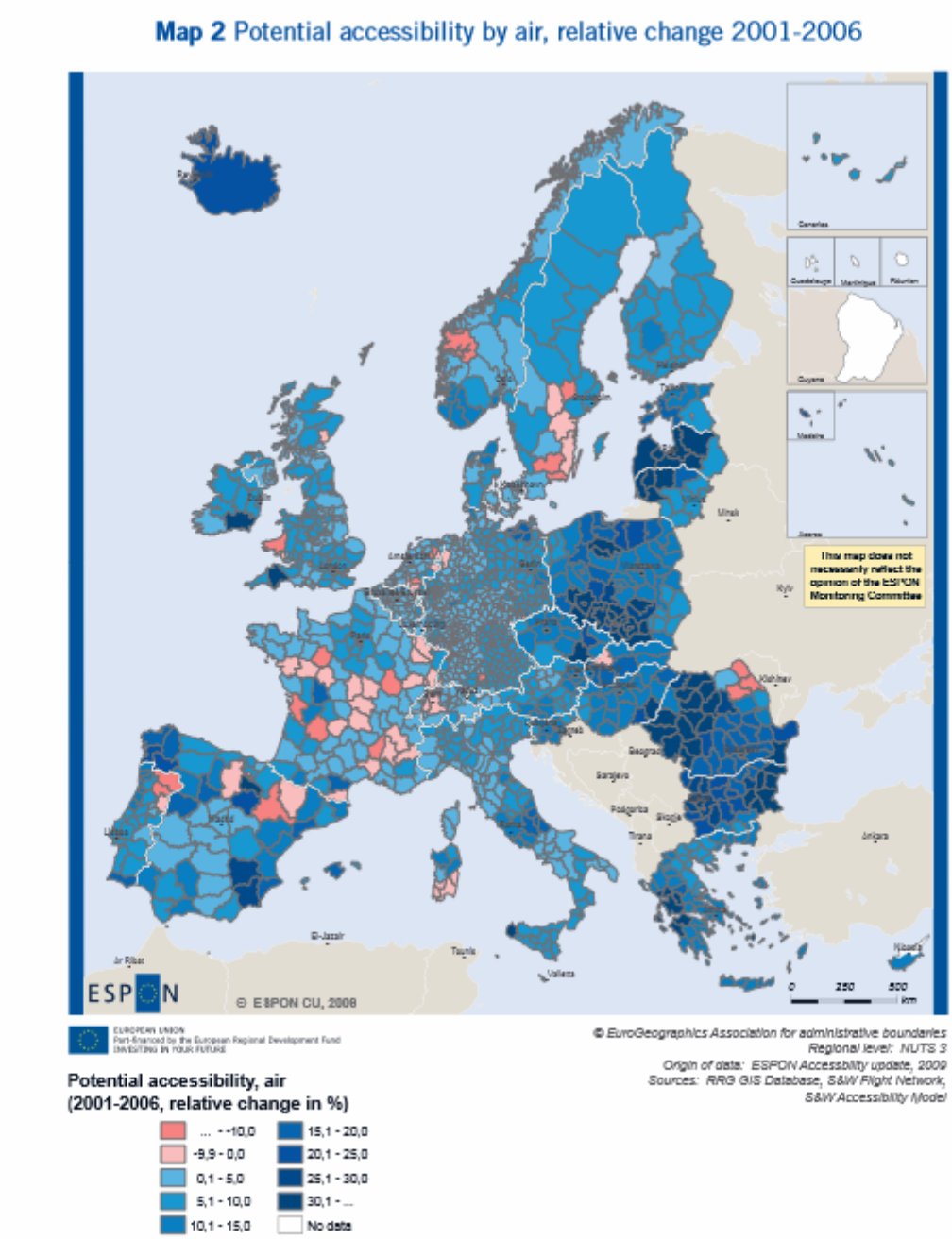


Figure 1, example map that could be placed in box "2 MAP", page 2, Appendix ETMS F&F layout suggestion. *Source:* Territorial Dynamics in Europe. Trends in Accessibility. Territorial Observation No. 2, November 2009, ESPON 2013 Programme. Page 12.

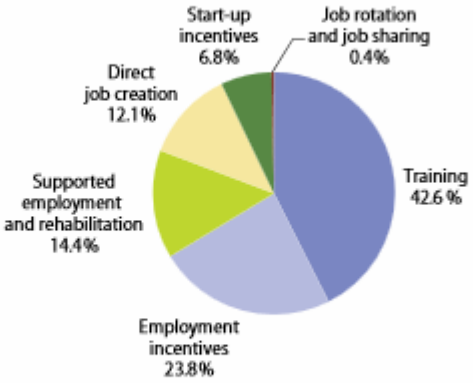
Table 1 Top Ten Movers, positive and negative, for air accessibility (change of index points 2001-2006)

Country	Region	Upwards
Romania	Timis	40,8
Greece	Kefallinia	39,8
Poland	Bydgosko-Torunski	37,0
Lithuania	Klaipedos (Apskritis)	35,6
Romania	Mures	30,6
Poland	Miasto Kraków	30,5
Romania	Arad	30,0
Czech Republic	Jihomoravský	28,7
Lithuania	Telsiu (Apskritis)	28,5
Poland	Miasto Wroclaw	26,4

Country	Region	Downwards
Netherlands	Noordoost-Noord-Brabant	-19,7
France	Dordogne	-20,0
Netherlands	Zuidoost-Noord-Brabant	-20,6
Netherlands	Zuidwest-Drenthe	-21,0
Sweden	Västmanlands län	-22,0
Sweden	Blekinge län	-22,9
Sweden	Kronobergs län	-23,1
Spain	Zaragoza	-25,5
Portugal	Alto Trás-os-Montes	-27,6
France	Côte-d'Or	-28,2

Figure 2, example charts that could be placed in box “3 PIE CHART or TABLE”, page 3, Appendix ETMS F&F layout suggestion. *Source:* Territorial Dynamics in Europe. Trends in Accessibility. Territorial Observation No. 2, November 2009, ESPON 2013 Programme. Page 10.

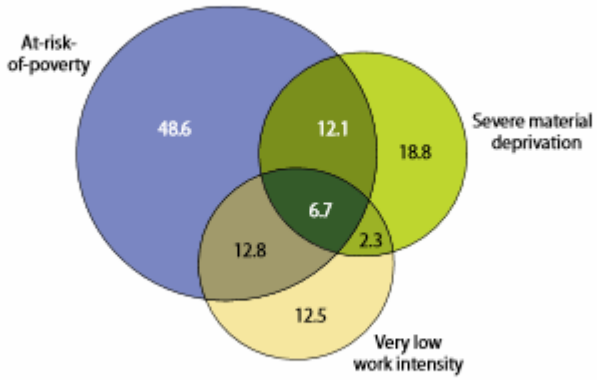
Figure 5.5.2: Public expenditure on labour market policy measures, EU-27, 2009 (1)
(% of total)



(1) Estimates; figures do not sum to 100% due to rounding.
Source: Eurostat (online data code: tps00077)

Figure 3, example chart that could be placed in box "3 PIE CHART or TABLE", page 3, Appendix ETMS F&F layout suggestion*. Source:* Europe in figures. Eurostat yearbook 2012. Eurostat. Page 265.

Figure 6.1.1: Number of persons at-risk-of-poverty or social exclusion analysed by type of risks, EU-27, 2009 (1)
(million)



(1) The sum of the data for the seven groups at-risk-of-poverty or social exclusion differs slightly from the total (published elsewhere) due to rounding.
Source: Eurostat (online data code: ilc_pees01)

Figure 4, example chart that could be placed in box "3 PIE CHART or TABLE", page 3, Appendix ETMS F&F layout suggestion*. Source:* Europe in figures. Eurostat yearbook 2012. Eurostat. Page 273.

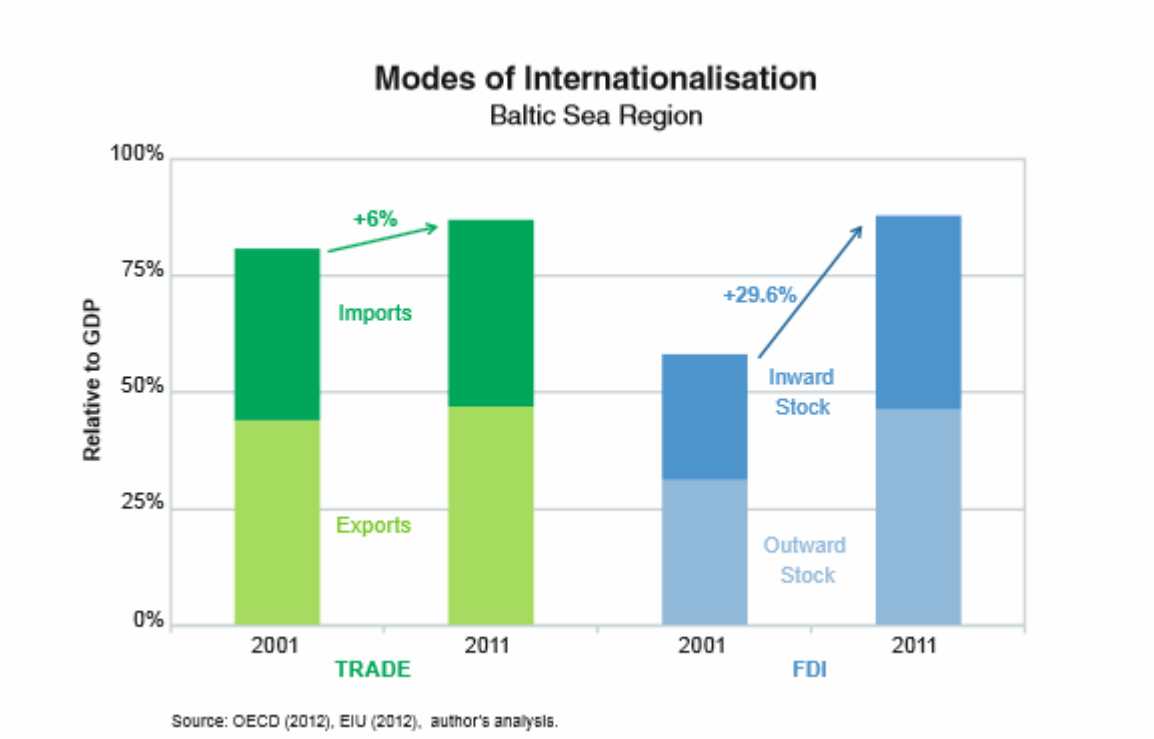


Figure 5, example chart that could be placed in box "4 CHART", page 3, Appendix ETMS F&F layout suggestion. *Source:* State of the Region Report. The Top of Europe Bracing Itself for Difficult Times: Baltic Sea Region-Collaboration to Sustain Growth. Baltic Development Forum. Page 47.

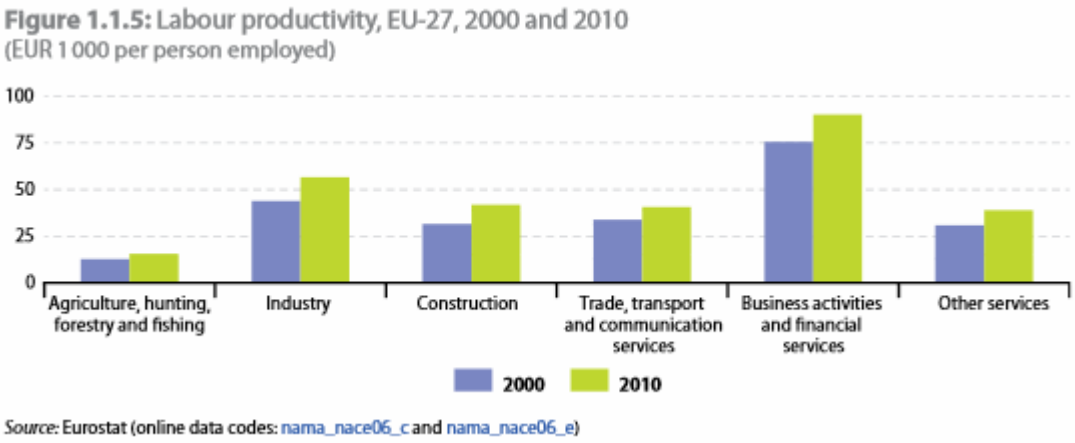


Figure 6, example chart that could be placed in box "4 CHART", page 3, Appendix ETMS F&F layout suggestion. *Source:* Europe in figures. Eurostat yearbook 2012. Eurostat. Page 44.

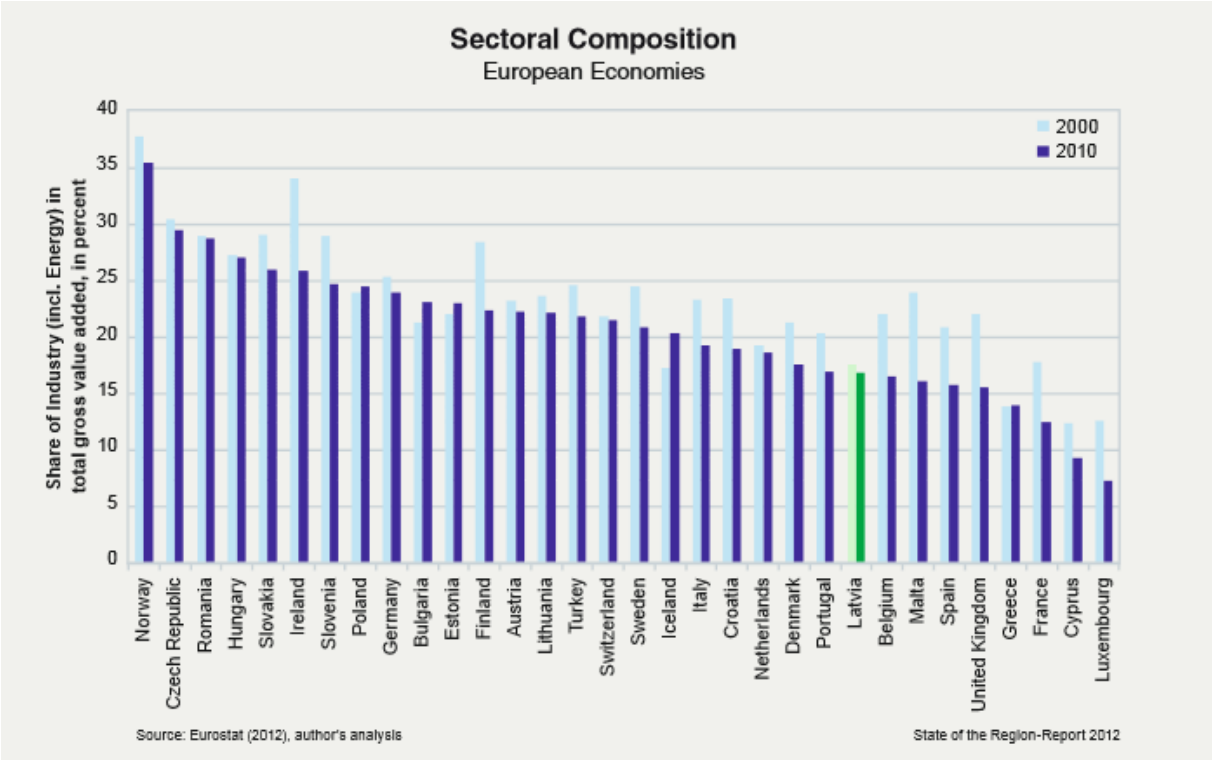


Figure 7, example chart that could be placed in box "5 TABLE or CHART", page 3, Appendix ETMS F&F layout suggestion. *Source:* State of the Region Report. The Top of Europe Bracing Itself for Difficult Times: Baltic Sea Region-Collaboration to Sustain Growth. Baltic Development Forum. Page 45.

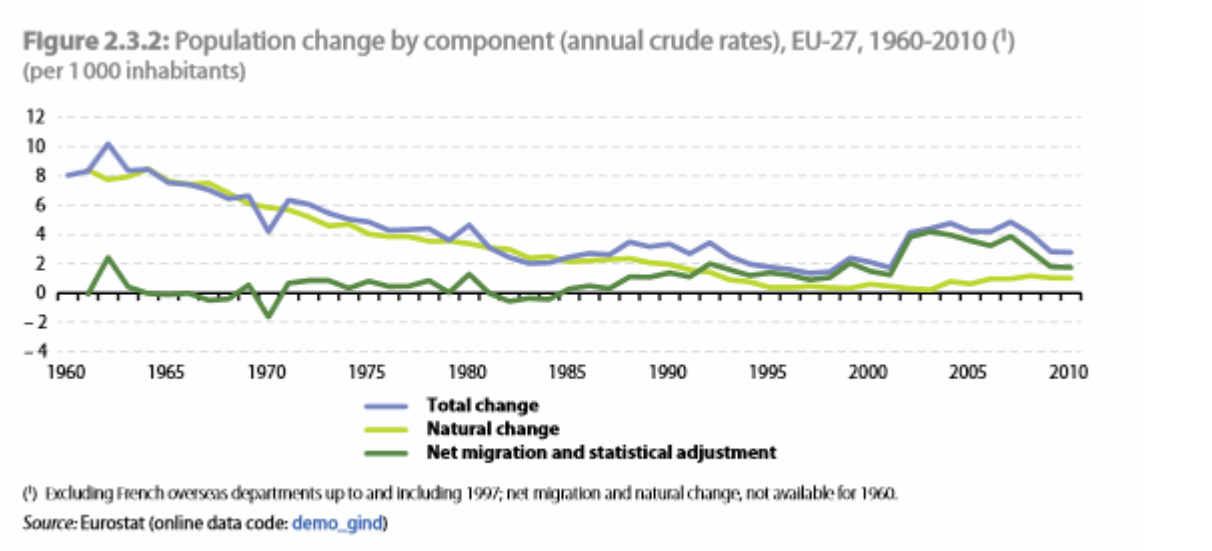


Figure 8, example chart that could be placed in box "5 TABLE or CHART", page 3, Appendix ETMS F&F layout suggestion. *Source:* Europe in figures. Eurostat yearbook 2012. Eurostat. Page 121.

10.4 Benchmark of existing ESPON Tools. Potential added value for ETMS

ESPON Database *(http://database.espon.eu/espondb/data) is currently being developed under the M4D project. A web platform has been developed allowing users both upload and query/download data. This Query and Download interface should be used to get indicators to feed the ETMS. This interface includes an advanced search functionality which facilitates the finding of data, either by topic, by project or by different advanced search options available.*

It is obvious, that **ESPON database** provides the most comprehensive source of territorial indicators over ESPON space, which will be the thematic content of the ETMS. From the beginning of the ETMS project, the ESPON database has been regarded as the main source for ETMS indicators. Although the direct access to the ESPON database has been also considered, the final solution for ETMS will be based on autonomous ETMS database. The main reason is that not only indicators contained in ESPON database, but also indicators from other relevant sources will be used for the ETMS. Therefore, it would not be profitable to connect ETMS directly to ESPON database.

Beside it, the experiences with the structure and organization of ESPON database provides a valuable source of information about how the ETMS database should be structured, filled in and maintained. Data availability, considering all spatial coverage, coverage of different levels of analytical units and completeness of time series has to be assured for selected indicators to avoid incomplete data series.

It is also very important to avoid the existence of similar or identical indicators in the database (which could differ e.g. only in original data source or in calculation algorithm).

OLAP Cube *(http://158.109.174.100/webbi/) is a tool based on the OLAP technology, prepared in the frame of the ESPON 2013 Database and ESPON M4D. It has been developed in order to be able to combine and query statistical data together with environmental or other types of territorial datasets in an easy way. The tool is being maintained regularly updated by the ESPON M4D project. It is using the European Reference 1 km^2 grid as ancillary data in order to aggregate and disaggregate data and make them comparable.*

Moreover, the OLAP Cube will be updated with new data proposed by ESPON projects and an Urban OLAP Cube is also foreseen, which could eventually facilitate the calculation of new indicators to be part of the ETMS.

OLAP Cube provides framework for flexible grid-based aggregations of spatial data for target analytical units. Is enables to combine different data types like NUTS units, LC/LU layers, population density grids etc. Clear advantage of OLAP Cube approach is its flexibility to support user defined analytical units on-fly and without need for GIS systems. On the other hand, it has to be considered that the preparation of the database requires extra effort and might be time consuming for large datasets.

OLAP Cube also enables the population dissagregation based on population density grid, which could be beneficial especially for regions with non-available population data. The tool is non-public – for researchers use only. Currently it disposes with Microsoft Excel based interface. However, the more user-friendly graphical interface is already under development and one of the main priorities of OLAP Cube developing group.

As the indicators used for ETMS will be mostly derived in form of values already calculated for spatial analytical units, the OLAP Cube could be only used in case of necessity to re-calculate selected indicators for different or newly added analytical units, for which indicators values are not available in ESPON database or other standard data sources.

Hyperatlas *(http://hypercarte.espon.eu/HyperCarte/initLicense.action) is the web analysis tool which is already available and its functionality and features can be examined. It is an analytical tool based on*

the multi-scalar territorial analysis concept. This web application allows the visualization, customization and advanced analysis of selected ESPON indicators. It is an example of user friendly interface, source of indicators for selection and inspiration for advanced analysis.

Hyperatlas (currently v2) is a web application prepared for viewing and analyzing of selected indicators. It works as JAVA based platform. It is intended for the visualization of predefined set of indicators and is not directly connected to the ESPON database – which is one of the main disadvantages of the Hyperatlas. The tool is designed for multi-scalar territorial analysis – indicator values are available at the NUTS0-NUTS2 levels for four different spatial coverages: ESPON area, Central and Eastern European countries, EU15 and EU27.

Although both expert and basic modes are available for more or less experienced users, even the basic one is reported to be too difficult for common users. The argument is, that too much advanced functions and features is incorporated in the application and especially several types of analytical maps and or charts seems quite difficult to understand. Beside it, not much textual explanation is included in frame of the tool. On the other hand, possibility to visualize both map and chart in the same time is missing in Hyperatlas.

Hyperatlas presents each of selected indicators on an analytical and synthetic approach, as it enables the user to explore all indicator´s numerator, denominator and ratio. Maps with different deviations could be selected – large, medium or small and it also provides synthetic approach, with two synthesis maps for each indicator included in expert mode.

It provides the user a possibility to customize indicators via numerator and denominator selection, which could be considered as one of the strengths of the tool. On the other hand, it also leads to the fact, that there is no control over indicator meaningfulness / suitability for the particular purpose of the analysis. Moreover, all indicators are put together, with no thematic break-down available – which could also be a bit confusing for less experienced user.

Although the version 2 of Hyperatlas is already available online, the tool is still under development and some features which are not included yet are planned to be added into the next version. The most significant of them are listed bellow:

- visualization of indicators development, trends and flows
- animations and projections for the future
- finding extreme values, filtering by interval and displaying in map
- easier integration of user´s data

Graphical user interface is not very attractive and it may seem bit archaic, compared to other contemporary applications with similar objective. Also the solution for exporting of reports is not very good – with separated PNG with “printscreen” like maps exported into one folder instead of one complete report.

***Online Mapping tool (RIMAP)** is currently under development by AIDICO, Spain. It should allow the production, visualisation, analysis and download of maps and diagrams directly linked with the data, indicators and information included in the ESPON Database.*

RIMAP – is the official ESPON database mapping tool. Evaluating the tool, it is important to consider, that it is still under development and some functionalities can be added or improved in the final version. RIMAP is adequate for viewing and exporting simple thematic maps of ESPON indicators. Both basic and expert modes are prepared for the users at different levels of knowledge or experience. RIMAP will be also available for the mobile/laptop use.

The tool is rather static, providing only limited possibilities for user´s interactivity, in sense of selecting units of interest and customizing the information which will be shown in map and charts or exported

graphics. Possibility of multi-selection of analytical units is missing, as well as hierarchical tree of analytical units – as a result, units can be selected only in map or in chart.

Displaying many units in the same time, on e.g. lower administrative level, still remains an unsolved problem. GUI of the application is rather conservative and based on users´ reactions it is not very appealing for users.

Indicator values are loaded directly from the ESPON database. Shape files of analytical units are stored separately, as they are not included in the ESPON database. The tool provides the users by the indicators grouping based on: Theme, Policy and Project. Indicators are specific for each theme, policy or project, which significantly limits the possibility of inappropriate use of particular indicator. On the other had, possibility of indicators normalization (e.g. by area or population) is missing.

Analytical units in both map and chart are “mouse-sensitive” - information about the unit can be displayed and unit can be selected or extended to lower level. RIMAP provides the animation with changing values of selected indicators in the time series.

In the same time, only one map and one chart can be displayed in the tool and only one indicator can be visualized in map and chart in the same time. RIMAP enables the user to customize the map and chart symbology or even chart type before exporting them, although some of these features or possibilities could be limited by ESPON regulations. However, it is not possible to customize the layout in general (e.g. hide chart or map). It affects especially the map window, which is rather small in comparison with the chart and also the solution for map navigation and zooming/pan etc. is slow and not very user friendly so far. Possibility of adding external layers (incl. WMS maps or google-like satellite maps) into map window is missing.

Map Finder *is currently under development. This web application should be used to store, search, find, display, zoom-in and out, print and download maps resulting from ESPON projects and reports. The tool should have a very user-friendly interface which should allow users to find a specific map in easy and fast way.*

Map Finder could be used as a tool for searching relevant maps, which have been already generated in frame of miscellaneous ESPON projects. For each indicator selected for ETMS, relevant maps should be queried for and displayed via Map Finder application from the map library. As a large amount of static maps has been produced so far in ESPON and their replication will not be the objective of the ETMS analytic tool, Map Finder represents optimal solution how to find appropriate map for the indicator of user´s interest without time consuming searching under particular ESPON project outputs.

ESPON Urban Benchmark Webtool (CITY BENCH) *is a new ESPON project in the same Call for Tenders as the ETMS. The Urban Benchmark is aimed at creating a “quick-scan” friendly webtool in order to benchmark and monitor European cities by means of a selected set of indicators.*

ESPON Urban Benchmark Webtool - CITY BENCH - enables comparing and benchmarking cities between each other or alternatively finding cities with similar properties indicated by similar values of relevant indicators. The main aim of the tool is to target territorial investments based on city performance. The tool disposes with interactive map, which enables the user to derive information about selected unit. Also selection of units via setting interval of attribute values directly in chart is a very interesting feature. The other interesting element of the City Bench is 4D chart which provides the information about proximity of the cities in 4D indicators´ space, when each axis represents value of different indicator.

ESPON Atlas is a tool intended for visualization of static maps. The digital ESPON Atlas application is only side-product of printed atlas. For incorporated maps creation, INFOGRAPHICS tools have been used. All maps are prepared according to ESPON mapping/charting rules, which could be valuable

source for ETMS maps design as it should also respect these ESPON rules. Also some interesting unconventional features/elements of cartographic representation which occur in ESPON Atlas maps, like e.g. quartal cartograms, can be used for reports produced by ETMS. For easy orientation and searching in thematic hierarchy of indicators, which are visualized in maps, hierarchical tree of indicators is provided.

BSR-TeMo - Territorial Monitoring for the Baltic Sea Region

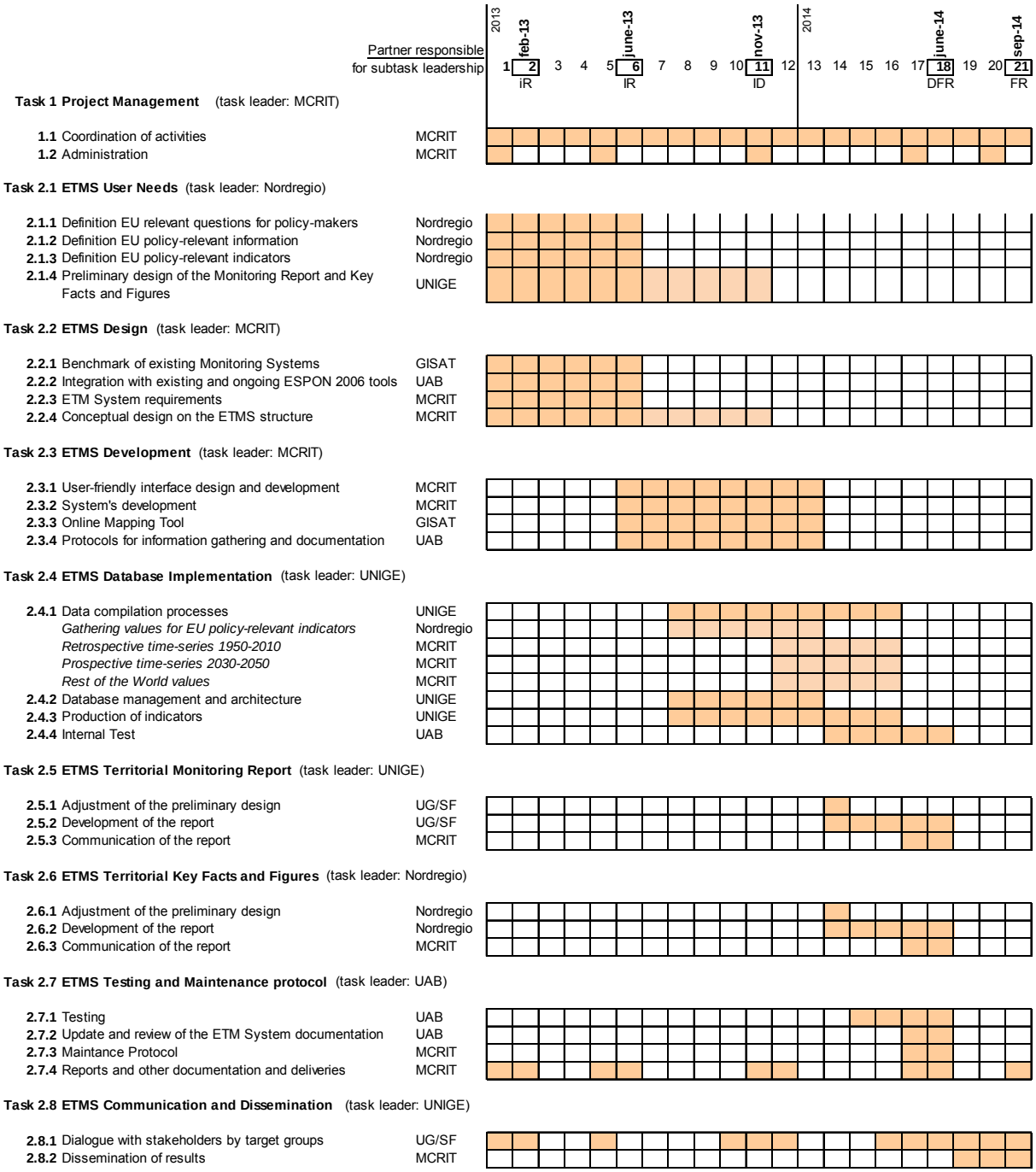
This tool is an example of simple and complex monitoring system. It is a portal with only web-site like solution, without any “mapping tool” for interactive data exploration. However, the portal is very well organized and provides easy access to indicators via thematic “entry points”. After indicator selection all outputs concerning this particular indicator are listed together, sorted by output type (report, news, documentation, etc.). This solution provides the user really effective way how to derive ale information he needs as fast and easy as possible. Therefore, similar solution of aggregating different types of outputs based on relevant topic/territory type which they belong to, should be considered also for ETMS purposes.

11 ANNEX III - Project Planning

11.1 Detailed work plan and partner involvement

The schedule of activities and the responsibilities of the TPG partners in the various tasks are presented in below.

Table 7. Schedule of ETMS activities



11.2 Schedule of Deliveries

The Lead Partner agreed to comply with the following timetable and delivery of results:

- **Inception Report, February 2013**
- **Interim Report, June 2013**
- **Intermediate deliveries, November 2013**
- **Draft Final Report, June 2014**
- **Final Report, September 2014**

11.3 Schedule of Meetings

Overall, during the life of the project, the TPG will take continuously cooperation with the ESPON CU and exchange ideas and information when considered relevant. In addition, the ESPON Monitoring Committee will be involved twice throughout the implementation of this project.

The Lead Partner agrees to participate in meetings, seminars and similar events of the ESPON 2013 Programme and, where appropriate, present results of the project. The upcoming appropriate events are the ESPON Open Seminar in Dublin on 13/14 June 2013 and the ESPON Internal Seminar in Lithuania in December 2012.

The following tentative schedule for meetings is proposed. Dates are only provided as an orientation and are to be adjusted in agreement with ESPON. Changes may happen as well along the project development in function of the project needs and ESPON suggestions.

- ***KoM with ESPON CU, Paphos December 2012***
- ***1st TPG meeting, Paphos December 2012***
- ***2nd TPG meeting, Barcelona May 2013***
- ***ESPON Open Seminar, Dublin June 2013***
- **3rd TPG meeting with Sounding Board, Stockholm October 2013**
- **ESPON Internal Seminar, Lithuania December 2013**
- **4th TPG meeting Spring/early Summer 2014**
- **ETMS Workshop (involving ESPON MC), Spring/early Summer 2014**
- **ESPON Open Seminar, Greece June 2014**
- **ESPON Internal Seminar, Italy December 2015**

11.4 Schedule of Reporting Duties

The first progress report must be submitted to the CU by the 30/07/2013 at the latest. Further progress reports have to be submitted by the 31/01/2014, 31/07/2014 and 30/04/2015 at the latest. Late reporting with respect of the abovementioned deadlines must be approved specifically by the MA on an ad hoc basis. The last progress report is due four months after the official

closing date of the project; as indicated in chapter 8.9.1 of the Programme Manual. The MA will indicate the official closing date to the LP in due time.

Based on the fact that payments by the European Commission to the MA will only be made in accordance with the corresponding budget commitments (Articles 76(1) and 75(1) of Council Regulation (EC) No 1083/2006), the LP must request payments within the following timeframe, as specified in the approved application form, section 2.

- **Year: 2012 Reporting period 1 (10/10/2012 – 31/03/2013)**
- **Year: 2013 Reporting period 2 (01/04/2013 – 30/09/2013)**
- **Year: 2013 Reporting period 3 (01/10/2013 – 31/03/2014)**
- **Year: 2014 Reporting period 4 (01/04/2014 – 31/12/2014)**

11.5 Synthesis Schedule

The table below synthesis all previously indicated activities, including TPG meetings, meetings and activities with ESPON, report delivery deadlines and financial reporting deadlines.

Table 8. Synthesis Schedule of ETMS Meetings and Deliveries

Meeting	Date	Location
KoM with ESPON CU	December 2012	Cyprus
1st TPG Meeting	December 2012	Cyprus
Inception Report delivery	**28 February 2013**	
2nd TPG Meeting	6-7 May 2013	Barcelona
1st Financial Reporting from TPG to LP	31 May 2013	-
ESPON Open Seminar	June 2013	Dublin
Interim Report	**30 June 2013**	
1st Financial Reporting from LP to ESPON	31 July 2013	-
3rd TPG Meeting	Fall 2013	Stockholm
Intermediate Deliveries	**30 November 2013**	
2nd Financial Reporting from TPG to LP	30 November 2013	-
ESPON Internal Seminar	December 2013	Lithuania
2nd Financial Reporting from LP to ESPON	31 January 2014	-
4th TPG Meeting	spring / early summer 2014	to be determined
ETMS Workshop (involving ESPON MC)	spring / early summer 2015	*to be determined*
ESPON Open Seminar	June 2014	Greece
3rd Financial Reporting from TPG to LP	31 May 2014	-
Draft Final Report	**30 June 2014**	
3rd Financial Reporting from LP to ESPON	31 July 2014	-
Final Report	**30 September 2014**	
ESPON Internal Seminar	December 2014	Italy
4rth Financial Reporting from TPG to LP	28 February 2015	-
4th Financial Reporting from LP to ESPON	30 April 2015	-

TPG meetings
Activities linked to ESPON
Deliveries
Financial reporting deadlines

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The ESPON 2013 Programme is part-financed by the European Regional Development Fund, the EU Member States and the Partner States Iceland, Liechtenstein, Norway and Switzerland. It shall support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory.