ESPON

ET2050
Territorial Scenarios and Visions for Europe

Project 2013/1/19

Final Report | 30/06/2014

VOLUME 13 – Mid-term Targets and Monitoring Indicators

Author: MCRIT

EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

This report presents a more detailed overview of the analytical approach to be applied by the ET2050 ESPON 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.

The approach presented in the report may not necessarily reflect the opinion of the members of 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.

Table of contents

Table of Figures

1. Methodology

1.1 Approach

The ET2050 proposes a set of 10 targets which the Vision is to fulfil, and the corresponding indicators to monitor progress towards these targets.

Proposed targets are based on existing targets in European roadmaps and strategies, mostly the EU2020 strategy. They specifically consider the outcomes of previous ESPON works aimed at the definition of indictors for the monitoring of cohesion in Europe. Where the territorial dimension is not made sufficiently explicit, the ET2050 has defined additional territorial targets.

Newly defined territorial targets are defined at European level but they are based on the analysis of regional trends.

The ET2050 follows the general criteria defined by the EC for the purpose of defining policy targets[1]:

- Credibility: it needs to be possible to achieve them given evidence-based analysis focussing on past and on future trends
- Challenging: they should mobilise stakeholders and policy authorities to implement necessary structural reforms
- Consistency: Send a strong policy message while remaining consistent with other policies
- Communicative: targets need to be clear and memorable, and easy to communicate

Quantitative values for targets are defined following the next steps:

- Where a target already exists at EU level in a former strategy or roadmap, it is incorporated into ET2050 without change for the sake of consistency.
- When existing targets do not cover the whole temporal span of ET2050 (2010-2050) they are extended based on the observation of past trends, paths towards mid term points, and without significant changes in trajectories.
- Where targets are introduced by ET2050, their quantification is done using foresight tools based on the scenario forecasts performed by the project, and eventually other reference projections at European level (e.g. Energy reference baseline).

1.2 Step 1 - Review of ESPON indicators for monitoring territorial development

A first step in path towards the definition of monitoring indicators and quantitative targets was the review of existing documentation in relation to monitoring produced within the ESPON programme. This mostly includes the following works:

- **ESPON INTERCO** (*Indicators of Territorial Cohesion,* 2010-2012). After ESPON 4.1.3, ESPON INTERCO was launched in the 2013 programme aimed at "developing indicators

[1] See Medeiros,J., Minty,P (2012); *Analytical support in the setting of EU employment rate targets for 2020,* EC Working Paper 1/2012. http://ec.europa.eu/social/main.jsp?langId=en&catId=89&newsId=1352&furtherNews=yes

and indices measuring territorial cohesion". From 600 initial indicators, INTERCO identified 32 top indicators organised in six territorial objectives.

- **ESPON SIESTA.** The ESPON SIESTA project developed in 2012 a system of indicators to monitor the regional deployment of the EU2020 Strategy. SIESTA indicators were based a screening of data availability at regional level, including as 'compulsory indicators' the headline targets set by the EU2020S.

- **ESPON ETMS** (*European Territorial Monitoring System).* Developed in the 2013 programme, on a parallel schedule to ET2050, the ETMS is the first attempt within ESPON to implement a Monitoring System at the level of the whole ESPON Area. The ETMS considers a set of 35 indicators in 5 thematic areas, comprising Human Capital, Social Inclusion, Economy, Accessibility and Environment.

- **ESPON BSR-TEMO** (*Baltic Sea Region Territorial Monitoring).* The BSR-TeMo aims at providing the Baltic Sea Region (BSR) with a monitoring tool based on around 30 selected territorial indicators relevant for monitoring the main territorial development trends and structures on the BSR.

- **ESPON CITYBENCH**: The objective of this project is to build a quick-scan webtool on urban indicators (around 20 all in all). The Citybench project has chosen an analytical categorisation of its indicators based on a sectoral approach (e.g. transport, economy…).

Most of these projects define thematic domains for grouping their indicators. ETMS, INTERCO and BSR-TEMO focus on aspects related to Territorial Cohesion and Territorial Capital. SIESTA Project chose a categorisation that was aligned with the headlines of EU2020 Strategy targets and flagship initiatives. The Citybench project has chosen an analytical categorisation of its indicators based on a sectoral approach (i.e. transport, economy…).

The thematic categories by these projects are presented in the next table. Correspondences between categories are displayed in colour codes.

INTERCO	ETMS	SIESTA	BSR-TEMO	CITYBENCH
Strong local economies ensuring global competitiveness	Economic competitiveness	Economic growth & competeveness	Economic performance & competitiveness	Transport
Innovative territories	Human capital	Green economy, climate change and energy	Access to services, markets & jobs	Economy
Fair access to Services, market and jobs	Social Inclusion	Research, development and innovation	Innovative territories	Quality of life
Inclusion and Quality of Life	Environmental Qualities	Education	Social inclusion & quality of life	Knowledge / smartness
Attractive regions of high ecological values and strong territorial capital	Availability of Services and Functions	Digital society	Environmental qualities	Demography
Integrated polycentric territorial development		Employment, skills and jobs	Territorial cooperation and governance	Social aspects (employment/ Poverty)
		Poverty, Exclusion and ageing		LUZ morphology

Figure 1 Thematic categories for indicators in past and on-going ESPON research
Source: Based on ESPON ETMS 2013

The next table lists the indicators considered by each of these monitoring systems:

ESPON CITYBENCH

Economy
GDP per inhabitant
Gas/electricity prices for industrial consumers
Ease of doing business

Transport
in-out bound flights
potential accessibility

Quality of life
% of LUZ consisting of green urban areas
Residential PM10

Knowledge / smartness
Photovoltaic energy potential
High-tech (total) patent applications to the EPO per million inhabitants
IP addresses
Share of renewable energy in gross final energy consmption

Demography
Population density
ageing index
old age depency ratio
Combined adaptive capacity to climate change

Social aspects
% persons unemployed
# of items posted as "crisis"/per inhabitant
# of items posted as "unemployed"/per inhabitant
# of items posted as "tourists"/per inhabitant

LUZ Morphology

ESPON ETMS

Economic Competitiveness
Total R&D expenditure as % of GDP
GDP per capita in PPS
GDP-PPS per person employed
Employment per sector*
Jobs potential within commuting distance

Human Capital
Population potential within 45 min
Net migration rate
Total population change
Birth rate
Old age dependency ratio
Persons aged 30-34 with tertiary education attainment

Social Inclusion
Employment rate 20-64 years
Total employment rate
Difference between female and male employment rates
Unemployment rate
Young unemployment rate
Disposable household income
At-risk-of-poverty rate

Environmental Sustainability
Share of Renewable Energy in Final Energy Consumption
Air pollution: PM10
Degree of soil sealing
Land use pattern*

Connectedness
Access to MUAs
Access to Airports
Access to Ports
Households with broadband access
Cooperation intensity (ETC)

INTERCO

Strong local economies ensuring global competitiveness
GDP per capita in PPS NUTS 3
Unemployment rate NUTS 3
Old age dependency ratio NUTS 3
Labour productivity in industry and services (NUTS2
Labour productivity per person employed (NUTS0)

Fair access to services, markets, jobs
Access to compulsory school (NUTS0)
Access to hospitals NUTS 0
Accessibility of grocery services
Access to university (SILC data)
Accessibility potential by road (NUTS3)
Accessibility potential by rail NUTS 3
Accessibility potential by air NUTS 3

Innovative territories
Population aged 25-64 with tertiary education NUTS2
Intramural expenditures on R&D (NUTS2)
Employment rate 20-64 (NUTS2)

Inclusion and quality of life
Disposable household income (NUTS2)
Life expectancy at birth NUTS2
Proportion of early school leavers (NUTS1)
Gender imbalances NUTS3
Difference in female-male unemployment rates (NUTS2)
Ageing index NUTS 3

Attractive regions of high ecological values and strong territorial capital
Potential vulnerability to climate change (NUTS3)
Air pollution: PM10 NUTS 3
Air pollution: Ozone concentrations NUTS3
Soil sealing per capita NUTS 3
Mortality, hazards and risks n.a. n.a.
Biodiversity n.a. n.a.
Renewable energy potential

Integrated polycentric territorial development
Population potential within 50km (NUTS3)
Net migration rate NUTS3
Cooperation intensity NUTS 2
Cooperation degree NUTS 2
Polycentricity index (NA)

10

BSR TEMO

Economic Performance and competitiveness
GDP per capita (NUTS3)
GDP/person employed (NUTS3)
Total GVA per economic branch (primary, manufacturing, services) (NUTS3)
Total employment per economic branch (primary, manuf., services) NUTS3
Unemployment rate, total (NUTS3)
Employment rate (20-64 years) (NUTS2)
Net migration rate (NUTS3)
Population change (NUTS3)
Demographic dependency ratio(s) (NUTS3)
Economic dependency ratio(s) (NUTS3)

Access to services, markets, jobs
Access to cities (grid, NUTS3)
Accessibility potential road (NUTS3)
Accessibility potential rail (NUT3)
Accessibility potential air (NUTS3)
Multi-mode accessibility
Access to (IC) train stations (NUTS3)
Households with access to internet at home
Population potential within 50km (grid, NUTS3)
Border crossings
Gender imbalances (ratio of male-female aged 25-39) (NUTS3)
Functional areas (LAU2)

Innovative territories
Population aged 25-64 with tertiary education NUTS2
Employment in technology and knowledge-intensive sectors (NUTS2)
Gross domestic exenditure on R&D (NUTS2)
Patent applications filed to the EPO (NUTS3 / NUTS2)

Social Inclusion and quality of life
At-risk-of-poverty rate (NUTS2)
Severe material deprivation rate (NUTS2)
Youth unemployment rate (15-24 years) (NUTS3)
Life expectancy at birth in years (NUTS2)
Self-assessed general health status (NUTS1-3)

Environmental qualities
New soil sealing/capita (NUTS3)
Air pollution (nr of days PM10 exceeds norm value) (NUTS3)
Land consumption by transport (NUTS3)
Eutrophication (Helcom HEAT index) (per sea area)
Fragmentation index (NUTS3)

Territorial cooperation and governance
Cooperation intensity (NUTS2)
Cooperation degree (NUTS2)

ESPON SIESTA

Economic growth and comptitiveness
GDP per head measured as purchasing power standard in percentage of the EU average (EU=100)
Change in regional GDP per head measured as purchasing power standard in percentage of the EU average (EU=100), 2000-2009
Change in national GDP per head measured as percentage of change in pps in the years of the crisis, 2007-2011
Regional labour productivity expressed in relation to the EU27 average (EU27=100), 2008

Green economy, climate change and energy
National share of renewable energy in gross final energy consumption represented as percentage, 2009
National share of renewable energy in gross final energy consumption represented as distance to the 2020 national targets, 2009
Regional potential for electricity production from wind power stations represented in meters/second, 2005
Regional potential for electricity production from photovoltaic panels represented in kWh, 2005
Energy intensity of the national economy represented as gross inland consumption of energy divided by GDP, 2010
Energy intensity of the national economy represented as distance to the 2020 national targets. 2010
Change in energy intensity of the national economy represented as percentage of change, 2000-2010
National GHG emissions, 2009, compared to 1990
Change in national GHG emissions represented as distance to the 2020 national targets, 2005-2009
Estimated regional GHG emissions excluding LULUCF, 2008

Research, development and innovation
General expenditure on R&D as percentage of regional GDP, 2009
General expenditure on R&D as percentage of regional GDP represented as distance to the 2020 national targets
Change in general expenditure on R&D as percentage of regional GDP
Human resources in science and technology as percentage of regional active population
Business expenditure on R&D as percentage of regional GDP, combined years from 2007 to 2009
Patent applications to the EPO per 1,000 inhabitants by inventor's region of residence

Education
Regional early school leavers from education and training as percentage of population aged 18 to 28 (drop-out rate)
Regional drop-out rate represented as distance to the 2020 national targets, 2010
Change in regional drop-out rate, 2000-2010
LUZ drop-out rate, combined years from 2004 to 2008
Regional population aged 30 to 34 with tertiary education, 2010
Regional population aged 30 to 34 with tertiary education represented as distance to the 2020 national targets
Change in regional population aged 30 to 34 with tertiary education, 2000-2010 41

Digital Society
People working in the ICT sector as percentage of total regional employment
Broadband penetration rate as percentage of total regional households, combined years from 2006 to 2009
Individuals (aged 16 to 74) who ordered goods or services over the Internet for private use as percentage of regional population, 20
Individuals who have never used a computer as percentage of regional population, 2011

Employment, skills and jobs
Regional employment rate as percentage of active population aged 20 to 64
Regional employment rate (percentage of active population aged 20 to 64) represented as distance to the 2020 national target, 201
Change in regional employment rate (percentage of active population aged 20 to 64)
Gender balance in regional employment rate (percentage of active population aged 20 to 64)
Regional unemployment rate (percentage of active population aged 15 to 74)
Regional youth unemployment rate as percentage of total labour force aged 15 to 24
Regional long-term unemployment as percentage of the unemployed population
Persons (aged 25 to 64) with low educational attainment (level 1 or 2 ISCED) by regions

Poverty, Exclusion and ageing
Regional/national population at-risk-of-poverty or social exclusion represented as distance to the EU2020 target, 2010
Regional long-term unemployment as percentage of the unemployed population
Regional long-term unemployment as percentage of the unemployed population
Regional long-term unemployment as percentage of the unemployed population
Regional people living in households with very low work intensity as percentage of population aged 0 to 59
Regional long-term unemployment as percentage of the unemployed population

Figure 2 Indicators by INTERCO, BSR-TEMO, SIESTA, CITYBENCH and ETMS

1.3 Step 2- Review of EU Strategies and Roadmaps

A second step was the review of EU Strategies and Roadmaps. The analysis of these policy documents provided headline indicators for the monitoring of recurrent policy debates, across sectors in Europe (society, economy, transport, energy, environment…), and in a number of cases, specific targets to be reached had been defined.

- Chapter 3 contains a synthesis of the current policy debates in Europe, and identified existing policy targets defined in relation to them.

- Annex 1 contains a full review of these documents, for reference.

The following policy documents have been reviewed in particular:

Strategies

- **EU2020 Strategy**. Having as meaningful subtitle "a strategy for smart, sustainable and inclusive growth", the strategy was developed during the crisis for achieving a sustainable future, which is about more jobs and better lives, acknowledging that the EU has the capability to deliver smart, sustainable and inclusive growth. On the one hand, three priorities are launched; on the other seven flagship initiatives (operative programmes) are established; finally, several headline targets that are set up for achievement of the Strategy goals by 2020.

- **Green Paper on Territorial Cohesion**. Through its objective of promoting harmonious or balanced development, territorial cohesion has a solidarity dimension, arguing for the reduction of territorial disparities and working for fair access to opportunities. Territorial cohesion is assumed to be about ensuring the harmonious development of all regions in Europe and about making sure that their citizens are able to make the most of their inherent features that contributes to sustainable development of the entire EU.

- **Territorial Agenda Of The European Union 2020**. Based on six challenges and potentials identified for territorial development, the TA2020 defined 6 territorial priorities, namely i) the promotion of polycentric development, ii) the integrated development of cities, rural and specific regions, iii) cross-border and transnational integration, iv) global competitiveness of the regions based on local economies, v) improving territorial connectivity, and vi) managing and connecting ecological, landscape and cultural values of regions.

Roadmaps

- **A Roadmap for moving to a competitive low carbon economy in 2050**. Together with the White Paper on Transport and the Energy Efficiency Plan, this Communication is a key deliverable under the Resource Efficiency Flagship Initiative of the EU2020S. It presents a wholistic Roadmap for possible action up to 2050 which could enable the EU to deliver greenhouse gas reductions in line with the 80 to 95% target agreed.

- **Energy Efficiency Plan 2011**. The Union has set itself a target for 2020 of saving 20% of its primary energy consumption compared to projections[2], which translates into a saving of 368 million tons of oil equivalent (Mtoe) of primary energy (gross inland consumption minus non-energy uses) by 2020 compared to projected consumption in that year of 1842 Mtoe. Energy efficiency can be seen as Europe's biggest energy resource. The Plan lists a number of actions to increase energy efficiency accross sectors to reach the targets in force by 2020.

- The **Roadmap to Resource Efficient Europe** has the aim of allowing the economy to create more with less, delivering greater value with less input (efficiency), using resources in a sustainable way and minimising their impacts on the environment (environmentally friendly). This roadmap lists a number of actions and targets to advance towards this goal.

- **Energy Roadmap 2050**. The Commission analysed the implications of the aim to reduce GHG emissions to 80-95% below 1990 levels by 2050 on its "Roadmap for moving to a competitive low-carbon economy in 2050". The "Roadmap to a Single European Transport Area"[3] focussed on solutions for the transport sector and on creating a Single European Transport Area. This roadmap focusses on solutions for the energy production sector.

- **2011 Transport White Paper**. The European Commission adopted a roadmap of 40 concrete initiatives for the next decade to build a competitive transport system that will increase mobility, remove major barriers in key areas and fuel growth and employment. At the same time, the proposals will dramatically reduce Europe's dependence on imported oil and cut carbon emissions in transport by 60% by 2050.

1.4 Step 3 – Identification of ET2050 Targets for the Territorial Vision

Based on the analysis of Step 1 and 2, a number of core indicators associated with existing targets were selected as core indicators of ET2050 and mid-term targets in the path towards the 2050 Territorial Vision.

The selection of these indicators was based on the discussions and input by the Expert Group integrated by ET2050 TPG representatives, its Sounding Board and member of the ESPON CU, as well as on the feed-back received from stakeholders during the activities of the project.

Targets were selected to promote an equally balanced set across sectors, as defined in most ESPON projects (see chapter 1.2). They were selected to integrate the goals of the EU2020 strategy as much as possible.

The work in Step 1 and Step 2 revealed that there were very few explicit Territorial Targets defined in the literature, and most of them were more related to environmental issues (e.g. land take) than to social and territorial cohesion. Based on this premise, the ET2050 project proposed an additional number of territorial targets, based on the aims of the Territorial Agenda.

ET2050 core indicators and targets are presented in Chapter 2 of this report. They are identified with reference roadmaps whenever not defined by ET2050.

---

2 7224/1/07 REV 1: Presidency Conclusions of the European Council of 8/9 March 2007. This objective translates into a saving of 368 million tons of oil equivalent (Mtoe) of primary energy (gross inland consumption minus non-energy uses) by 2020 compared to projected consumption in that year of 1842 Mtoe. This objective was reconfirmed by the June 2010 European Council (17/6/2010 Nr: EUCO 13/10).

3 COM(2011)144, 28 March.

2. Proposed Targets for the EU Territorial Vision

The following table synthesises the 10 mid term targets adopted by ESPON ET2050 towards the accomplishment of the Territorial Vision. Following to the table, each indicator is presented in context of the current policy framework.

In bold characters, indicators with a more explicit territorial dimension.

	Topic	Indicator	Target proposed by	Indicator value in 2010	Value for target and time horizon
1	Wellbeing	Healthy Life duration in years	European Innovation Partnership on Active and Healthy ageing	62 years in 2010	Increasing 2 years every decade
2	**Shrinking Regions**	**% of NUTS3 losing population**	**ESPON ET2050**	**-**	**95% of NUTS3 regions will not lose population beyond 7,5% by 2050**
3	Tertiary Education Attainment	% of population aged 30-34 with tertiary education	EU2020 Strategy (extended by ET2050)	33,4% in 2010	40% in 2020 50% in 2050
4	Labour Market	% people employed of population 20-64	EU2020 Strategy (extended by ET2050)	68,5% in 2010	75% in 2020 80% in 2050
5	Smart Europe	Gross domestic expenditure on R&D (% of GDP)	EU2020 Strategy (extended by ET2050)	2,0% in 2010	3,0% in 2020 4,0% in 2050
6	**Regional Economic Gap**	**Gap in GDP per capita (percentile 95 / percentile 5)**	**ESPON ET2050**	**8,0 in 2010**	**To reduce the gap by 50% by 2050**
7	Clean Energy	% of renewable energy sources in gross final energy consumption	EU2020 Strategy (extended by ET2050 based on reference EC energy baseline)	12,5% in 2010	20% in 2020 50% by 2050
8	**Territorial Openness**	**Number of remote NUTS3 regions in Europe**	**ESPON ET2050**	**209 remote NUTS3 in 2010**	**No remote NUTS3 by 2050**
9	**Compact Settlements**	**Annual land take in km2**	**EU Resource Efficient Roadmap 2050**	**920km2 sealed yearly in 2010**	**800km2 by 2020 0km by 2050**
10	Sustainability	CO2 emissions reduction respect to 1990	EC Low-carbon Roadmap 2050	-14,3% in 2010	-20% in 2020 -80% in 2050

Figure 3 Synthesis of ET2050 targets towards the 2050 Territorial Vision

2.1 **Wellbeing**

Indicator: Healthy Life Duration

Units: Years

Target: Increasing 2 years of healthy life duration every decade

Defined by: European Innovation Partnership on Active and Healthy ageing

Rationale

Healthy life duration is selected as a proxy to good quality of life.

Good quality of life is considered should be a main indicator; it has a clear territorial dimension, but a main difficulty is that it is not so easy to measure by just one indicator, as it includes a range of components such as locational characteristics, accessibility, GDP, and also components that are already listed as other separate targets.

This target was originally proposed by the European Innovation Partnership on Active and Healthy ageing, the target was set by 2020, and is extended to 2050 by ET2050.

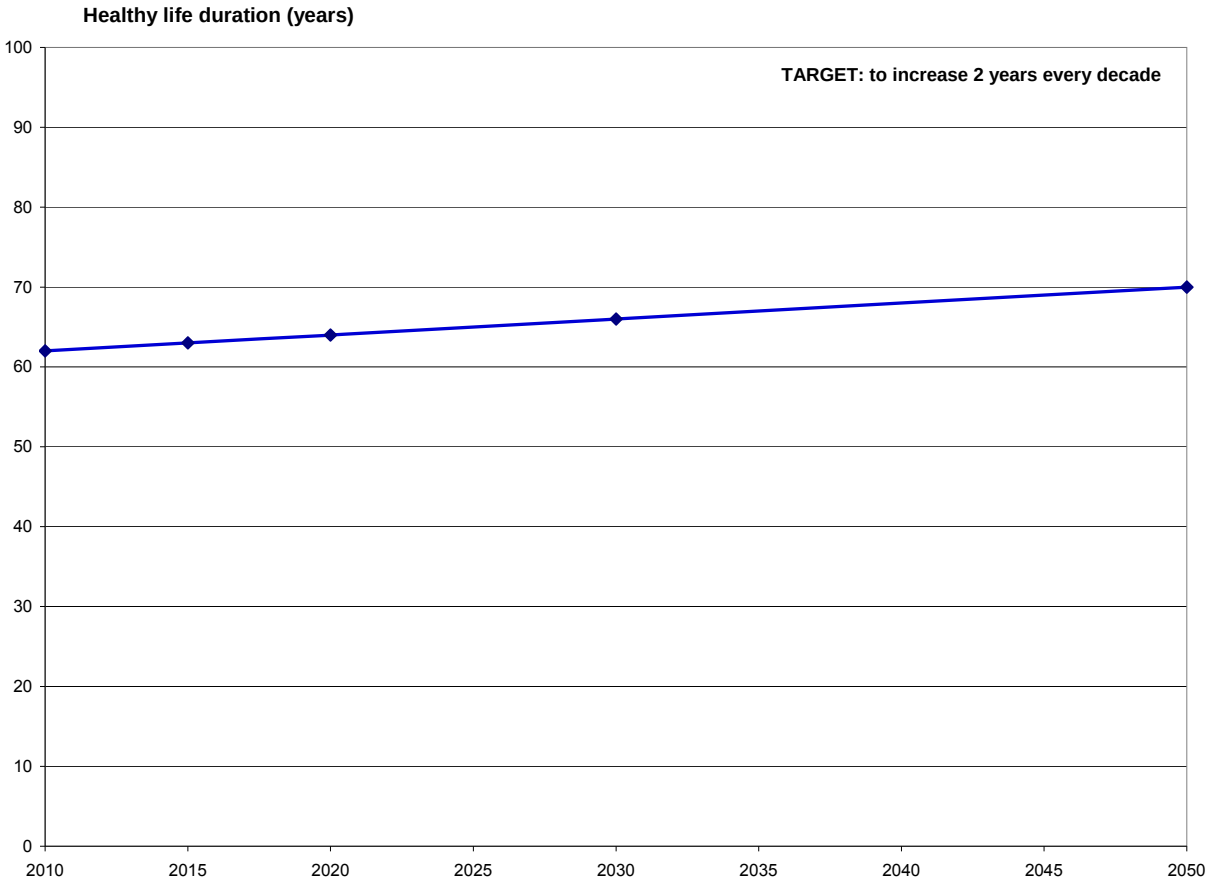


Figure 4 Target 1, on Healthy life duration

2.2 Shrinking Regions

Indicator: % of NUTS3 losing population

Units: %

Target: 95% of European NUTS3 regions will not have lost more than 7,5% of their population by 2050 in relation to 2010

Defined by: ESPON ET2050

Rationale

This indicator is proposed as a proxy to many complex phenomena linked to population ageing, low fertility rates, migrations between rural areas and cities, and flows between European regions for labour reasons (e.g. east to west) or residential tourism (north to south).

Population decrease is not necessarily a bad thing in itself. It is important for instance population structure, e.g. aging. However, it is likely that policies will be directed towards mitigating the consequences of aging rather than trying to stop it, as the aging of Europe is hardly unavoidable. The key question is about regions loosing young/active population that migrates to find a job elsewhere. Hardly these regions loosing active population -their most previous asset- will be able to catch up the development level of other regions. Setting any target either on net migration (or net labour migration), or on fertility, however is rather difficult (as it may restrict the freedom of movement or freedom to decide about the number of children).

This indicator is defined by ESPON ET2050 based on results of forecast scenarios.

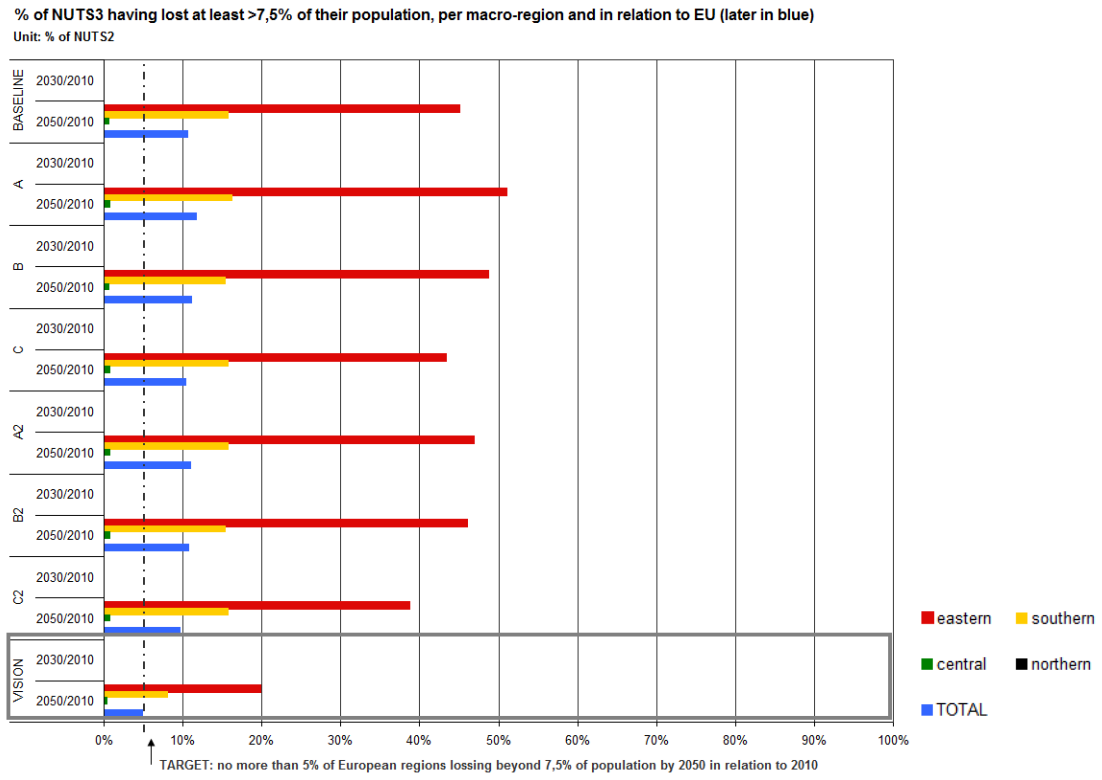


Figure 5 Target 2, on Shrinking Regions

2.3 Tertiary Education Attainment

Indicator: % of population aged 30-34 with tertiary education

Units: %

Target: 40% in 2020 and 50% in 2050

Defined by: EU2020 Strategy (extended beyond 2020 by ET2050)

Rationale

The Europe 2020 strategy has targets on 'improving education levels, in particular by aiming to reduce school drop-out rates to less than 10 % and by increasing the share of 30–34 year olds having completed tertiary or equivalent education to at least 40%.

The number of tertiary educated follows a steady increasing trend. The 13,4% growth over the period 2000 to 2012 equals an increase of about 50% in tertiary graduates in the EU according to Eurostat.

This target is assumed by ET2050, and projected towards 2050 at a slower rhythm up to 45% by 2050.

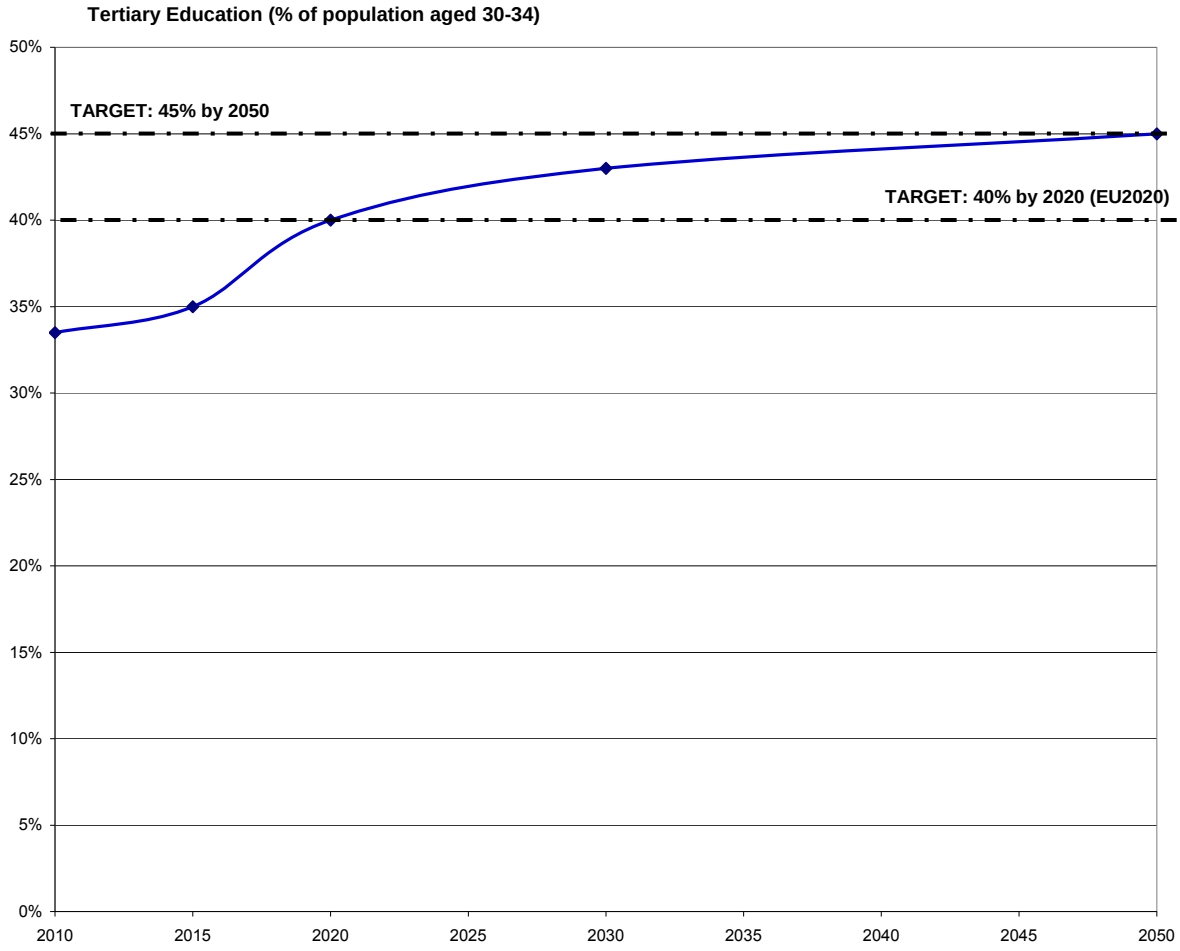


Figure 6 Target 3, on Tertiary Education Attainment

2.4 Labour Market

Indicator: % people employed of population 20-64

Units: %

Target: 75% in 2020 and 80% in 2050

Defined by: EU2020 Strategy (extended beyond 2020 by ET2050)

Rationale

The European Council adopted as part of the EU2020 headline targets the raise of the employment rate for population aged of 20 to 64 years up to 75 % by 2020. The implementation of the strategy counted on the promotion of more flexible working conditions (e.g. part-time work or work from home) and other initiatives that may encourage more people to enter the labour market including improvements in the availability of childcare facilities, providing more opportunities for lifelong learning, or facilitating job mobility. 'flexicurity' includes policies that simultaneously address the flexibility of labour markets, work organisation and labour relations, while taking into account the reconciliation of work and private life, employment security and social protection.

This target is assumed by ET2050, and projected towards 2050 at a slower rhythm up to 80% by 2050.

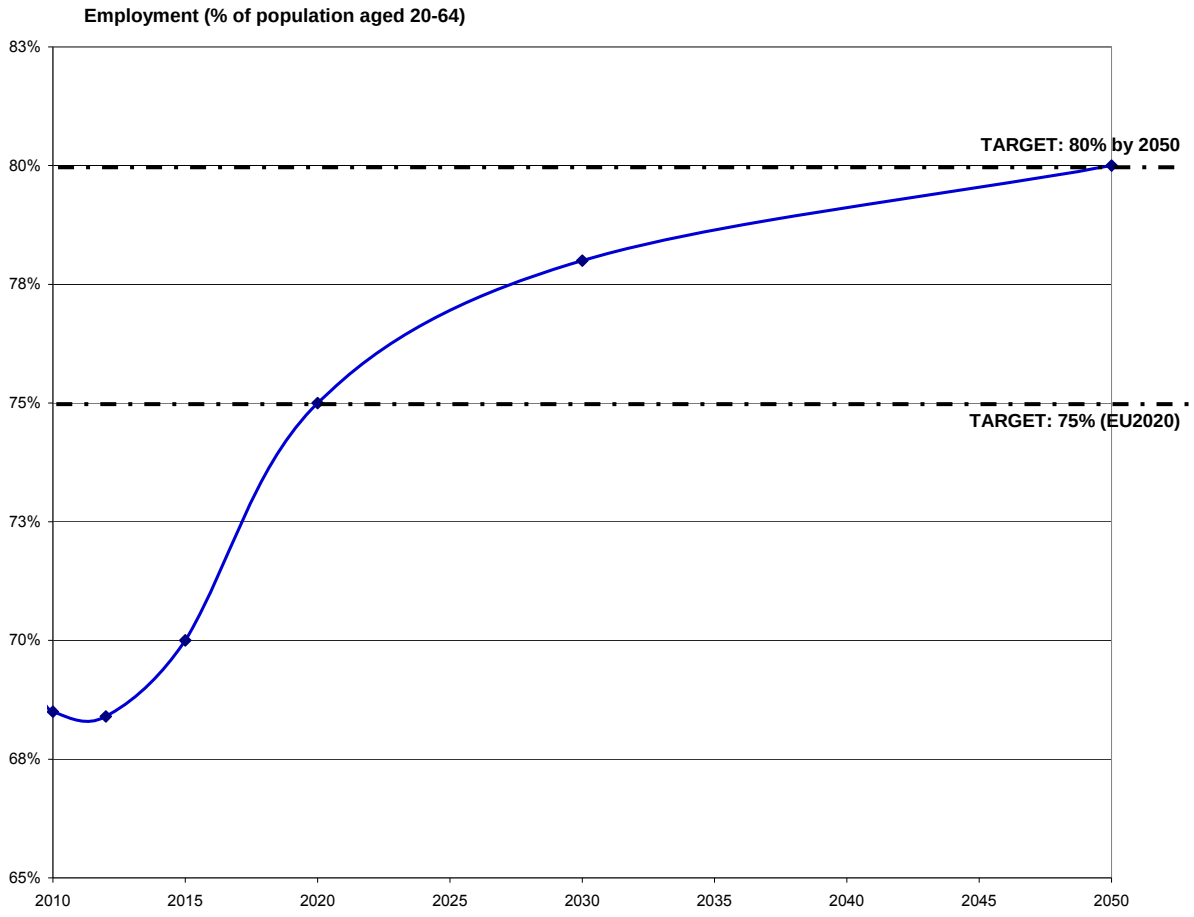


Figure 7 Target 4, on the Labour Market

2.5 Smart Europe

Indicator: Gross domestic expenditure on R&D (% of GDP)

Units: %

Target: 3,0% in 2020 and 4,0% in 2050

Defined by: EU2020 Strategy (extended beyond 2020 by ET2050)

Rationale

Target proposed by the EU2020 Strategy, and extended to 2050 by ESPON ET2050, based on the benchmarking of current GERD rates in leading world economies, e.g. 3,5% in Japan, 4,0% in Korea.

The EC recognises the territorial dimension of innovation and its role in potential territorial development and cohesion in both, the Green Paper on the European Research Area as well as the Green Paper on Territorial Cohesion. Knowledge has in recent years become a key driver for growth of economic systems, and the access to knowledge is generally considered as a key condition for innovative activities in our modern economy.

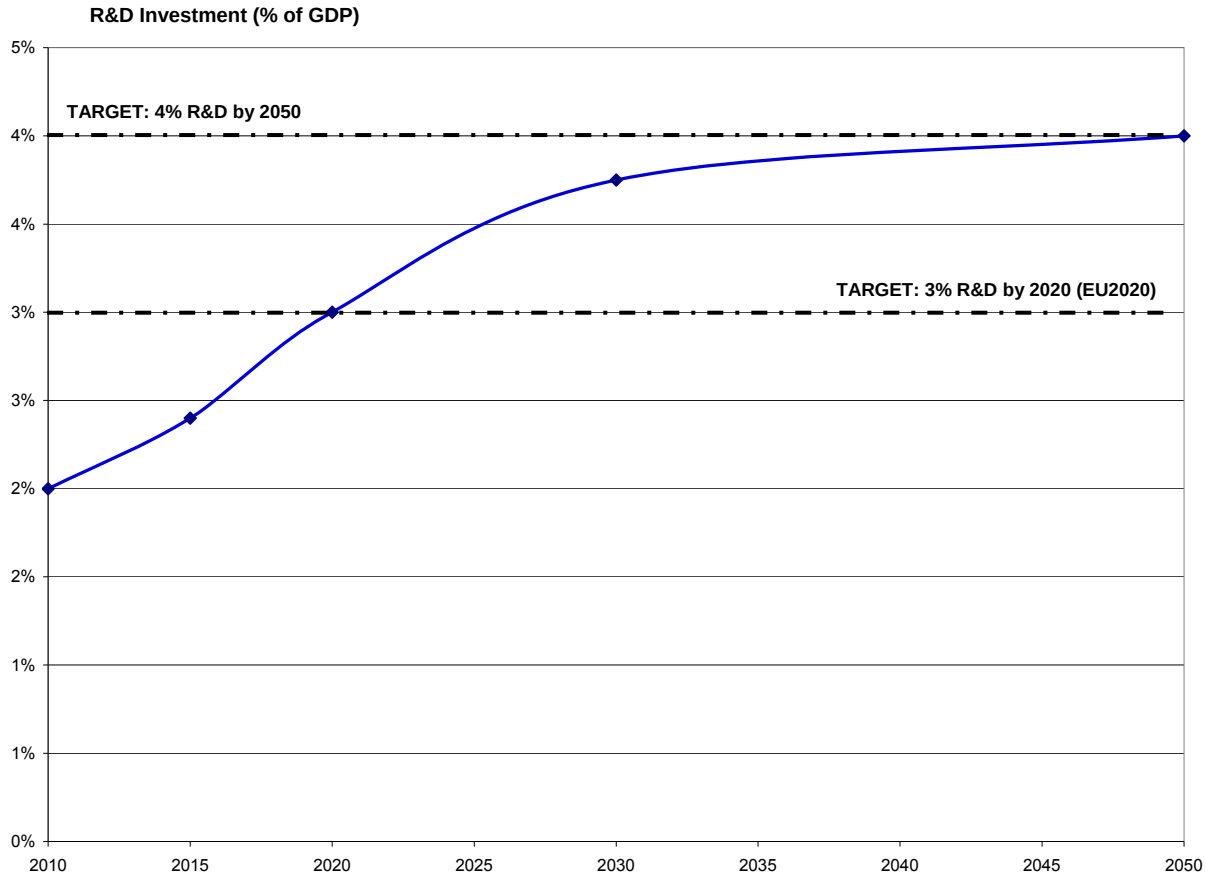


Figure 8 Target 5, on Research and Development

2.6 Regional Economic Gap

Indicator: Gap on GDP per capita defined as
(GDP per capita)$_{\text{NUTS3 percentile 95}}$ / (GDP per capita)$_{\text{NUTS3 percentile 5}}$

Units: -

Target: To reduce the regional gap by 50% in 2050 in relation to 2010

Defined by: ESPON ET2050

Rationale

Proposed by ESPON ET2050 to measure progress towards cohesion in Europe, from a territorial point of view. It measures the distance in GDP per capita between wealthiest European regions and laggards. It excludes the upper 5% and lower 5% tails, as these provide very extreme visions of the European territory, considered not representative of the overall ensemble.

The difference between economic development across European territory remains high if compared for instance with the USA or Japan. Even if GPD is not capturing fundamental wellbeing conditions and remains contradictory from economic point of view, the measure of the difference between GDP per capital (e.g. considering or not the informal GDP)

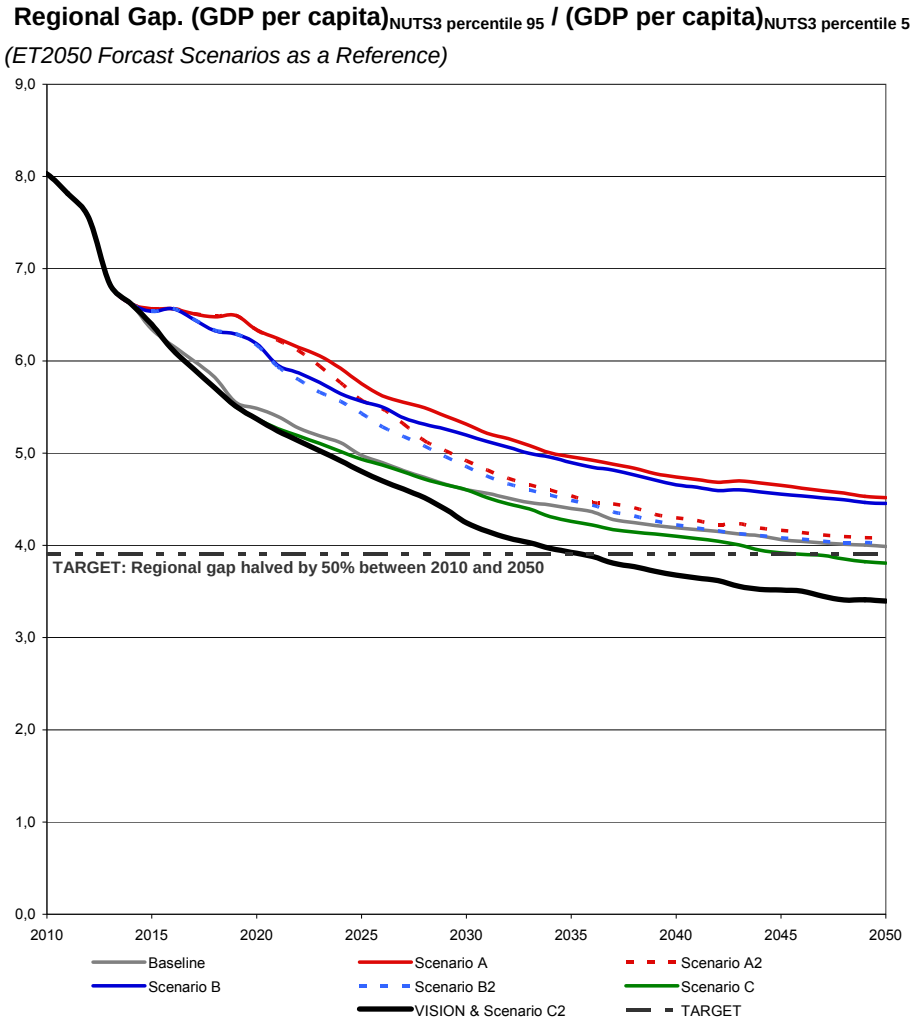


Figure 9 Target 6, on the Regional Economic Gap

2.7 Clean Energy

Indicator: % of renewable energy sources in gross final energy consumption

Units: %

Target: 20% in 2020 and 50% in 2050

Defined by: EU2020 Strategy (extended beyond 2020 by ET2050)

Rationale

In line with the EC Energy Reference Scenario (DG Energy 2014), it is assumed that the EU energy system evolves so that the legally binding targets of RES (20-20-20 targets included in the EU2020 Strategy) are achieved, i.e. 20% share of gross final energy consumption from RES. Beyond 2020, no additional RES targets are set. In line with the EC Energy Baseline, it is suggested that RES should represent by 2050 at least 50% of the gross final energy consumption.

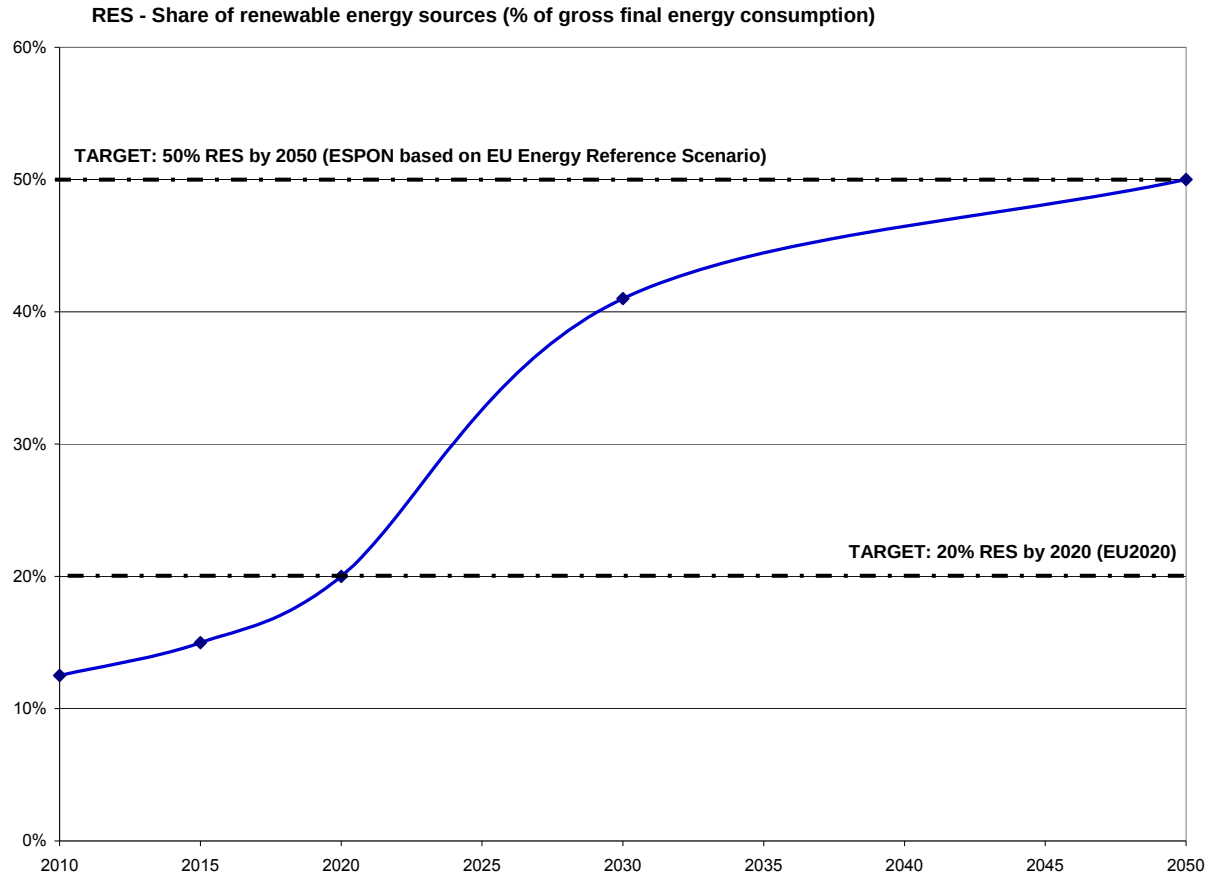


Figure 10 Target 7, on Clean Energy

2.8 Territorial Openness

Indicator: Number of remote NUTS3 regions in Europe

Units: -

Target: No remote NUTS3 by 2050

Defined by: ESPON ET2050

Rationale

It is assumption that transport infrastructure and accessibility are necessary conditions for economic growth in the Union, having a direct impact on the attractiveness of regions for businesses and people. This is supported by the Cohesion Reports (2007, 2010), which reiterate that improved accessibility tends to create new job opportunities for rural and urban areas, even if they warn that potentialities from improving accessibility depend on the previous competitiveness of the regions concerned, being some regions liable to lose out as they become more open to competition from elsewhere.

The 5th Cohesion Report introduced the notion of remoteness in the analysis of regional typologies in Europe. Intermediate and rural regions (as previously defined by the OECD) became remote whenever less than half of their residents could drive to the centre of a city of at least 50 000 inhabitants within 45 minutes (Regional Focus 01/2008). There are currently 209 remote NUTS3 in Europe.

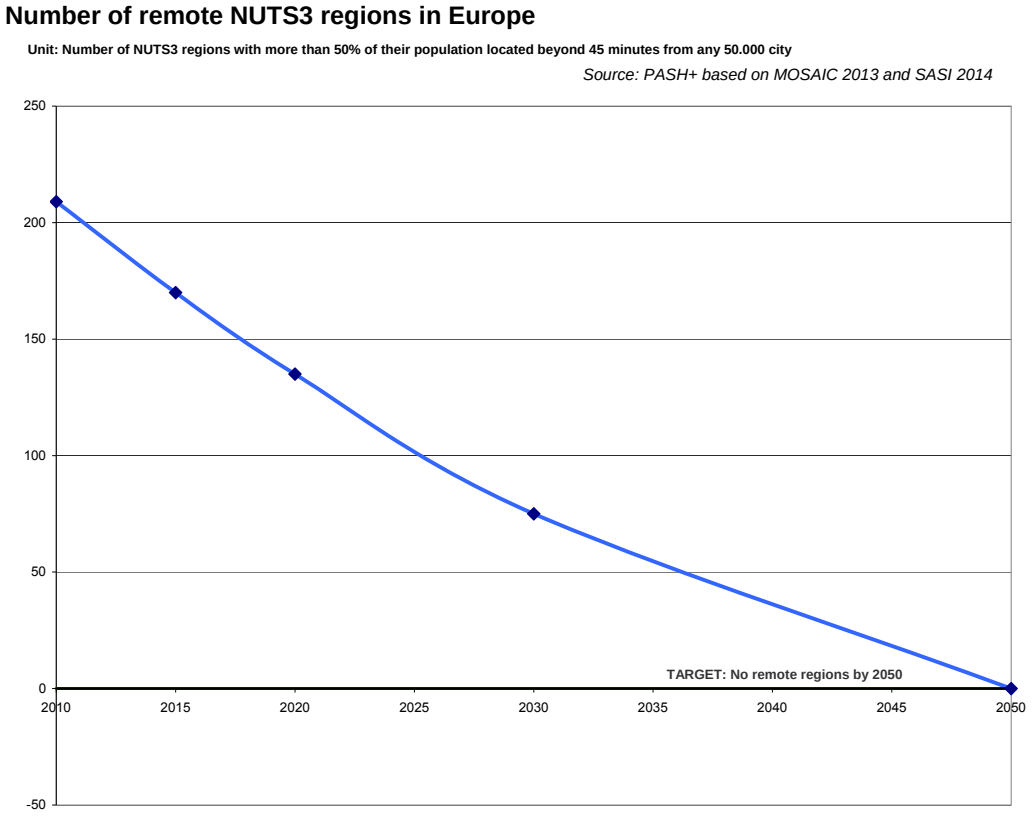


Figure 11 Target 8, on Territorial Openness

2.9 Compact Settlements

Indicator: Annual land take in km2

Units: km2

Target: 800 km2 in 2020 and no further land take in 2050

Rationale

The Roadmap to Resource Efficient Europe envisages by 2050 a European economy that has grown in a way that respects resource constraints and planetary boundaries, thus contributing to global economic transformation, with all resources are sustainably managed (from raw materials to energy, water, air, land and soil). Artificial land continues to expand in Europe (in the period 2000-2006 at a rate of 920 km² per year).

In this approach, the Commission Staff Working Paper backing up the Roadmap proposes to reach a state of no net land take by 2050, which would then force a mid term target of maximum 800 km² per year in the period 2010-2020. This target is assumed by ET2050 as a measure of land occupation and soil sealing.

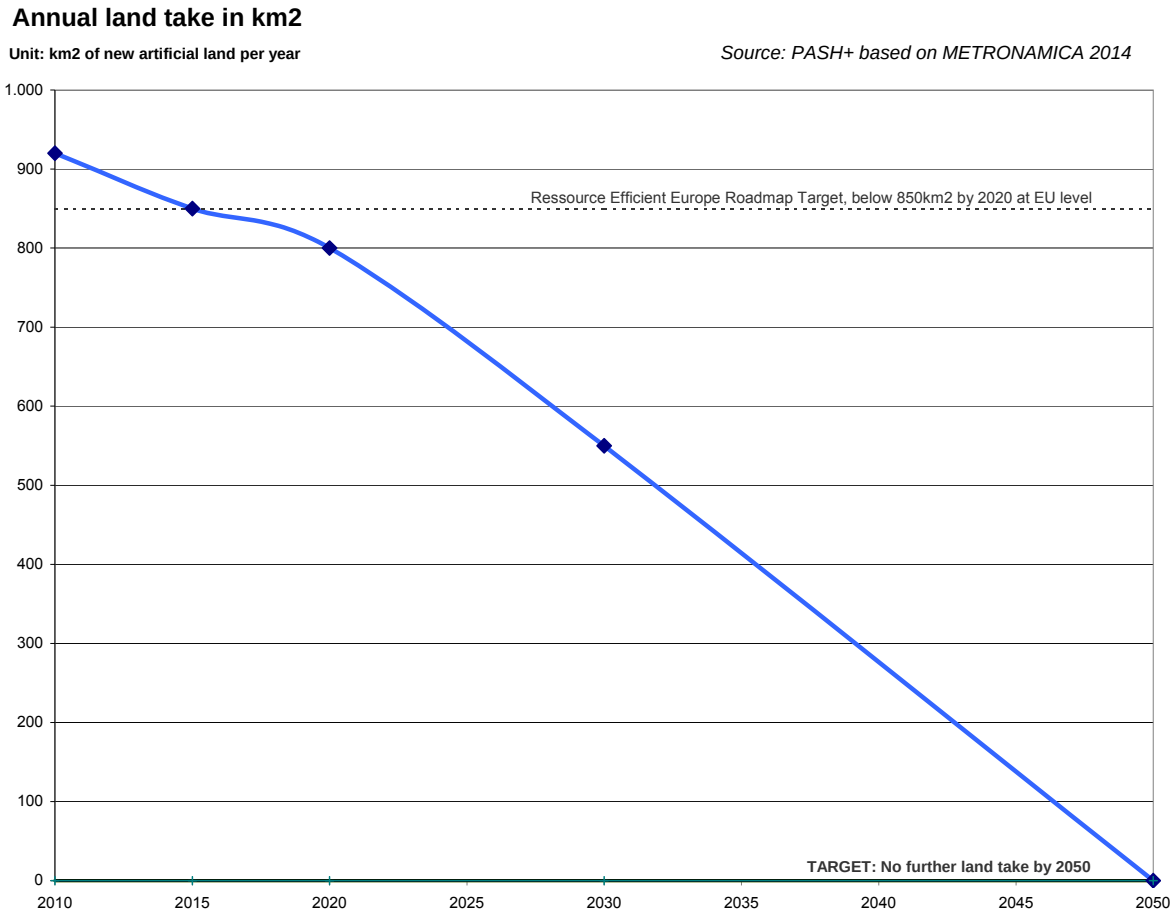


Figure 12 Target 9, on Compact Settlments

2.10 **Sustainability**

Indicator: CO2 emissions reduction respect to 1990

Units: 1990 = 100

Target: 800 km2 in 2020 and no further land take in 2050

Defined by: EC Low-carbon Roadmap 2050

Rationale

This target is adopted being central to any policy strategy in the EU, aiming at mitigating the effects of climate change. It is a binding target set up in the 20-20-20 targets, which the European Parliament adopted after heavy negotiations in the frame of the European Union Climate and Energy Package in December 2008. It is at the core of the energy and environmental policy (Energy Roadmap, Low-Carbon Economy Roadmap, Resource Efficiency Roadmap), it has steered the transport policy (Transport White paper), and it is one of the Headline indicators of the EU2020 Strategy.

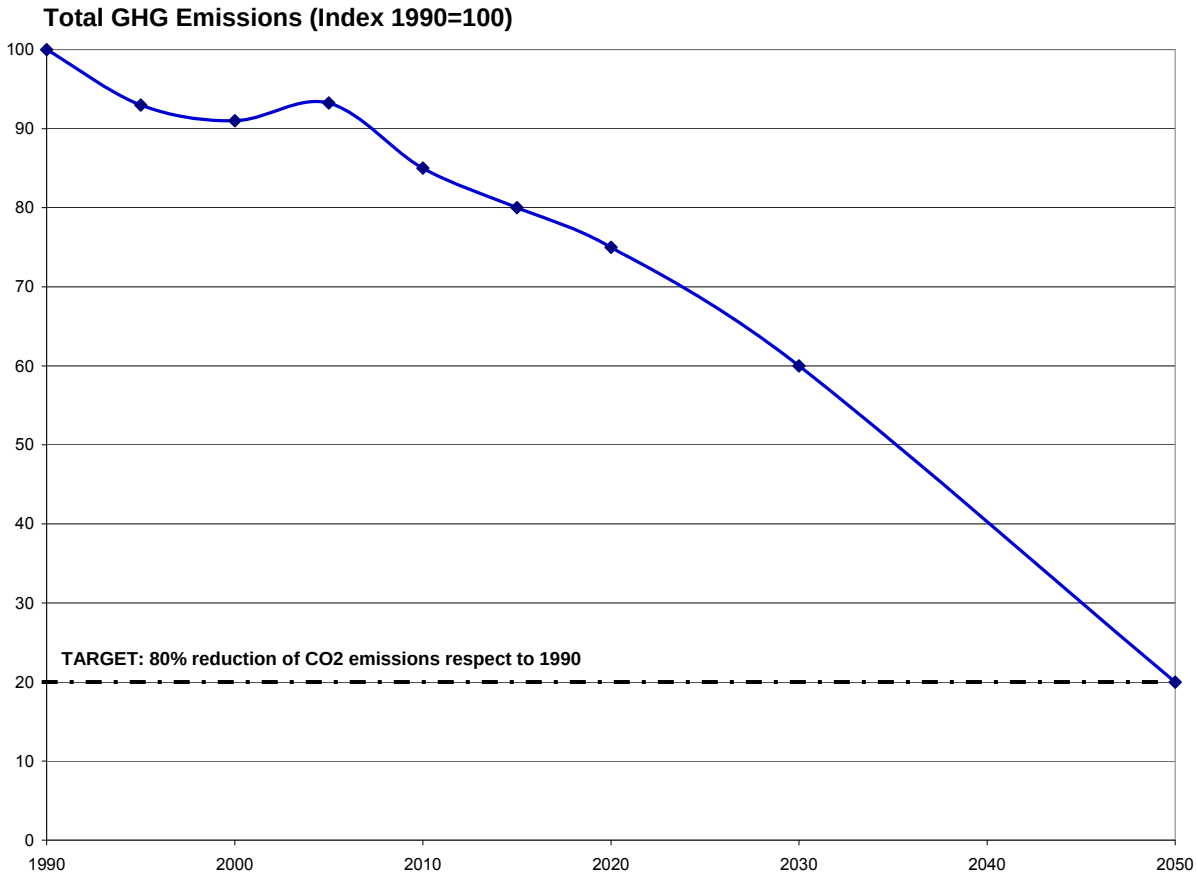


Figure 13 Target 10, on CO2 Emissions

3. Other Policy Targets

3.1 Main European policy targets in relation to European challenges

Demographic burden and forced increase in labour productivity

With mortality decline and fertility going to below replacement TFRs after the 50s-60s baby boom will result in “super-ageing” in Europe as baby boomers cross into old age from 2010 onwards. Changes in the age composition of the population may have severe effects on the development of labour supply, with the share of the working-age population sooner or later starting to decline in all EU countries. Demographic burden will negatively impact GDP per capita growth, all other things remaining equal. Economic growth in the EU will therefore need to come from increasing employment rates and/or increasing productivity.

The EU2020 strategy has set the objective of at least 75% of the 20-64 year-olds to be employed by 2020.

Flourishing elderly-based economies but tensions for welfare states

The impact of ageing in Europe on the overall cost of national welfare systems is a major challenge for the EU, as well as the redistribution of these costs among Member States given the expected increasing mobility of elder population (e.g. North-South seasonal migrations). At the same time, the services sector targeted to the elder will increasingly become an important business niche as the elderly will have new needs that will have to be addressed by the society, therefore this will be an economic opportunity.

The European Innovation Partnership on Active and Healthy Ageing has set the objective of increasing healthy life for everyone in Europe by an average of 2 years by 2020.

Dealing with migratory flows, both at origin and destination

Gaps in the labour forces of Europe are being filled by new migrants, who change the ethnic composition of the population. Managing migration and integrating new migrants in host countries (both intra-EU and extra-EU) is today and will remain in the future an important challenge for the European society. The other side of the balance is how to deal with migration-drained areas in Europe, given the fact that those leaving are labour active cohorts, increasing the processes of ageing and social dependency and exclusion in many migration origin regions.

The EU2020 has set the objective of at least 20 million fewer people in or at risk of poverty and social exclusion by 2020.

Social wellbeing linked to increasing education levels

Parents’ education is an essential determinant of family socioeconomic status, and in turn determines a child’s educational and occupational aspirations. All cohorts in Europe are significantly higher educated than the preceding one. The overall increase however hides many disparities in the levels of educational attainment. Education quality measured by cognitive ability (quality) matters more for economic growth than enrolment or attainment shares (quantity).

The EU2020 strategy has set a target to reducing school drop-out rates below 10% by 2020.

Human capital development in specialised disciplines

One important objective of the Lisbon strategy was to increase the number of students in mathematics, science and technology, disciplines where the European deficit is increasing. The fact that adults improve their competencies and acquire new skills notably in the labour market needs not to be ignored as well, especially if their levels of educational attainment are high.

The EU2020 strategy has set a target to at least 40% of 30-34 year old have completed tertiary education.

Lower R&D investment compared to other World regions

Competition in innovation from emerging economies will be huge in upcoming key sectors such as materials, energy and nanotechs; and in mature sectors EU leaded like transport and food industry. The EU2020 set the objective of running from 1.8% in 2005 to 3.0% in 2020 of the EU's GDP invested in R&D (public and private combined).

The EU2020 strategy has set a target to reach at least 3% of GDP in R&D investment.

Structural transformations of the EU economic system required

On optimum currency area is mainly characterised by (*i*) perfect capital mobility, (*ii*) perfect labour mobility and (*iii*) substantial supra-national budget. In the Eurozone, capital is mobile but labour is not mobile enough and there is a very weak common budget. Numerous economist and politicians are raising the idea of the end of the Eurozone. Even if these views remain in minority such scenarios cannot be excluded, and the risk of non-planned evolution of the European monetary Union should be considered as a possible option even if its consequences could be hardly evaluated.

The Maastritch Treaty states that all Member States except from UK and Denmark are obliged to join the Eurozone when they fulfil convergence criteria. Latvia joined in Jan 1st 2014 and Lithuania should join in Jan 1st 2015.

Struggling to financing Member States public debt

The expensive welfare state as well as the poor efficiency of many public administrations made Europe a relatively indebted continent, but this situation has worsened with the economic crisis, so that now almost all countries have a significantly larger burden of public debt on GDP. In 2012, 14 out of the 27 Member States already had larger debts to GDP rations than 60%, mostly Western European countries; and most countries also unaccomplished deficit targets. Better public management, and coordination between countries will be needed in order to maintain the debt sustainable.

Maastricht criteria impose a maximum 3% of GDP yearly budget deficit and a 60% of GDP cumulated debt.

Lowering EU external resource dependency

The EU is especially vulnerable to resource scarcity. It is the top importer of raw materials worldwide, especially dependent on foreign energy resources and other key resources like rare earths (essential for the development of high-tech products and green technologies). The EC has been promoting the reduction of energy dependency and the increase of efficiency.

By moving to a low-carbon society, the EU should increase 20% energy efficiency by 2020 and ensure 20% of energy is originated in Renewable Energy Sources (EU2020 Strategy).

Clean, efficient and integrated transport services across Europe

Mobility needs of people and companies shall be served by high quality and reliable services all over Europe. The EU foresees large investments in infrastructure to complete the TEN networks and allow cross-border interoperability, and seeks substantial policy advances towards the liberalisation of the transport sector (road, rail and air), as well as increasing efficiency of service management, technological performance of transport, and more responsible traveller behaviour.

In urban areas the EC is willing at phasing out fuel powered cars by 2050, while by then the majority of medium distance passenger trips should be made by rail. In freight transport, a shift from road to rail and inland waterway transport of 30% by 2030 and above 50% by 2050 is targeted. Transport fatalities shall be moved close to zero by 2050.

Climate change mitigation and adaptation

Climate change mitigation and adaptation will become one of the major environmental challenges for Europe. The EU already suffers from increased extreme events; land temperature in Europe is expected to increase leading to extreme winter temperatures of eastern and northern Europe and extreme summer temperatures of southern Europe. The sea level rise may change the frequency and intensity of the storm surges.

The EU is committed via self-imposed targets to reduce GHG emissions to 20% below 1990 levels by 2020 (EU2020 Strategy) and to 80-95% by 2050 (Roadmap to a low-carbon economy in 2050). Transport emissions (including CO2 aviation, excl. maritime) are set to be 20% lower in 2030 in relation 2008, and 60% lower in 2050 in relation 1990's (Transport White Paper).

Biodiversity conservation

Around 1 in 4 species in the EU are currently threatened with extinction and 88% of fish stocks in Europe are over-exploited or significantly depleted. Biodiversity helps cope with the impact of climate change, e.g. helps limiting atmospheric concentrations of air pollutants, absorbing excess flood water, buffering us against coastal erosion or extreme weather events.

The EU is committed to preserving biodiversity (EU Biodiversity to 2020) via a number of targets, e.g. restoring at least 15% of degraded ecosystems by 2020, or doubling the number of habitat assessments under the Habitats Directive that show an improved conservation status by 2020, and increasing by 50% the number of improving species assessments. Forest Management Plans need to be in place by 2020 for all forests that are publicly owned and for forest above a certain size.

Cleaner air conditions

The implementation of the revised Thematic Strategy on Air Pollution is to contribute mitigating air pollution in EU. However, climate policy may also have drawbacks in terms of air quality, e.g. the rise in the use of biomass for heating may contribute to increase the emissions of PM. Warmer temperatures can accelerate production and increase concentrations of photochemical oxidants in urban and rural areas and thus contribute to increase the exposition of European citizens to ground level ozone.

The Thematic Strategy on Air Pollution sets targets for 2020, e.g. 47% reduction in loss of life expectancy produced by particulate exposure, 10% reduction in acute mortalities from exposure to ozone, reduction in excess acid deposition of 74% and 39% in forests and surface freshwater areas respectively, 43% reduction in areas or ecosystems exposed to eutrophication, as well as a sharp reduction of several air transport emissions parameters.

Water management

Water availability in the EU is not currently an issue, but this situation could change in the future due to climatic change, mostly from a higher frequency of extreme weather events such as droughts, heavy rainfalls and heavy storms. These events will challenge existing water infrastructure and significantly increase the need for new ones.

The Water Framework Directive urges EU Member States to restore degraded surface and ground waters to "good status" by 2015.

3.2 Territorial VISION faced with other policy targets

Topic	Source	Target	Unit	Year of official target	2010	2015	2020	2030	2050
SOCIAL TARGETS									
Health	European Innovation Partner-ship on Active and Healthy Ageing	Increase healthy life for everyone in Europe by an average of two years	Healthy life years	2020	62	63	64	66	70
Education	EU2020	Reducing school drop-out rates below 10% by 2020	% of population aged 18-24	2020	14,1%	12,5%	10,0%	8%	7%
Education	EU2020	At least 40% of 30-34 year old completed tertiary education	% of population aged 30-34	2020	33,5%	35%	40,0%	45%	50%
Education	Education and training benchmarks to 2020	At least 95% of children between 4 and the age for starting compulsory primary education should participate in early childhood education	% of population aged 4-6	2020	92,3%	93,0%	95,0%	97%	100%
Education	Education and training benchmarks to 2020	The share of 15-years olds with insufficient abilities in reading, mathematics and science should be less than 15%	% of population aged 15	2020	20%	17,5%	15,0%	10%	0%
Education	Education and training benchmarks to 2020	an average of at least 15% of adults (age group 25-64) should participate in lifelong learning	% of population aged 25-64	2020	9,3%	12%	15,0%	20%	30%
Poverty / Social exclusion	EU2020	At least 20 million fewer people in or at risk of poverty and social exclusion by 2020	Thousands of people	2020	115.716	110.000	95.000	80.000	70.000
Social disparities	ESPON ET2050	To achieve an EU28 GINI coefficient by 2050 bellow to the lowest national GINI coefficient of an EU MS before the crisis (23.5, Denmark 2006)	GINI coefficient for EU	2050	30,5	30,5	27	25	20
ECONOMIC TARGETS									
Employment	EU2020	75% of the 20-64 year-olds to be employed	% of population aged 20-64	2020	68.6%	70%	75,0%	78%	80%
R&D / innovation	EU2020	From 1,8% in 2005 to 3% of the EU's GDP (public and private combined) to be invested in R&D	% of GDP	2020	2,0%	2,4%	3,0%	3,5%	4,0%

Topic	Source	Target	Unit	Year of official target	2010	2015	2020	2030	2050
Eurozone members	Maastricht Treaty	All Member States except from UK and Denmark are obliged to join the Eurozone as they fulfil convergence criteria. Latvia will join in Jan 1st 2014 and Lithuania in Jan 1st 2015.	Number of States integrating the Eurozone	permanently	17	19	24	28	28
Inflation (Eurozone)	ECB	Maximum 2%	Number of Eurozone members fulfilling	permanently	11	11	22	28	28
Inflation (Eurozone)	Maastricht Treaty	Not more than 1,5 percentage points above the rate of the three best performing Member States	Number of Eurozone members fulfilling	permanently	16	19	24	28	28
Government deficit (Eurozone)	Maastricht Treaty	Maximum 3.0% of GDP	Number of Eurozone members fulfilling	permanently	5	10	20	28	28
Government debt (Eurozone)	Maastricht Treaty	Maximum 60% of GDP	Number of Eurozone members fulfilling	permanently	14	16	18	23	28
TERRITORIAL TARGETS									
Accessibility	ESPON ET2050	At least 50% population in all European NUTS3 can access a 50.000 inh city within 45 minutes drive by 2050. No NUTS3 regions in Europe classified as remote by 2050 *(Dijkstra&Poelman definition)*	Number of NUTS3 regions classified as remote	2050	165	145	110	50	0
Regional Disparities	ESPON ET2050	To achieve a GINI coefficient by 2050 equal to 20	GINI index applied to average GDP per capita at regional level	2050	28	27	25	23	20
Regional GAP	ESPON ET2050	Difference between largest and lowest performing EU country in RGA Disposable Income in PPS lowered to 1/3	Max/Min Real gross adjusted disposable household income per head	2050	3,13	2,95	2,67	2,10	1,04
Land use	The Roadmap to a Resource Efficient Europe - "The Roadmap" *(Proposed, yet not adopted target)*	Average annual land take, from additional 920 km2 per year in 2000-2006, to 800km2 in 2020 and 0km2 by 2050	New artificial land in km2	2020 - 2050	920	850	800	550	0

Topic	Source	Target	Unit	Year of official target	2010	2015	2020	2030	2050
Land use	The Roadmap to a Resource Efficient Europe - "The Roadmap" *(Proposed, yet not adopted target)*	At least 10% of the marine EU area is covered by a coherent network of (Marine Protected Areas) MPAs	% of protected marine area	2020	2%	5%	10%	20%	25%
ENERGY TARGETS									
Total GHG emissions	EU2020 Roadmap for moving to a competitive low carbon economy in 2050 (Low-Carbon RM 2050)	GHG emissions 20% lower in 2020 than in 1990 (or 30% if a agreement can be achieved to follow Kyoto) (EU2020). GHG 80% lower in 2050 than in 1990 (40% in 2030, 60% in 2040) (Roadmap)	Index 1990=100	2020 2050	85	80	75	60	20
GHG by sectors: Power generation	Low-Carbon RM 2050	GHG 95% lower in 2050 than in 1990	Index 1990=100	2050	93	80	65	40	5
GHG by sectors: industry	Low-Carbon RM 2050	GHG 85% lower in 2050 than in 1990	Index 1990=100	2050	80	78	76	67	15
GHG by sectors: Transport	Transport White Paper 2011 (WP2011) & RM2050	Transport emissions (including CO2 aviation, excl. maritime) 60% lower in 2050 in relation 1990's *(Stabilisation of air emissions by 2020 (carbon neutral growth) and 50% reduction in 2050 compared to 2005 (IATA); CO2 emissions from maritime transport should be cut by 40% (if feasible 50%) by 2050, compared to 2005 levels)*	Index 1990=100	2050	130	125	120	105	40
GHG by sectors: Residencial	Low-Carbon RM 2050	GHG 90% lower in 2050 than in 1990	Index 1990=100	2050	88	80	72	55	10
GHG by sectors: Agriculture	Low-Carbon RM 2050	GHG 45% lower in 2050 than in 1990	Index 1990=100	2050	80	75	70	63	55
GHG by sectors: other	Low-Carbon RM 2050	GHG 75% lower in 2050 than in 1990	Index 1990=100	2050	70	50	38	28	25

Topic	Source	Target	Unit	Year of official target	2010	2015	2020	2030	2050
Primary energy consumption	EU2020 Low-Carbon RM 2050	20% increase in energy efficiency by 2020, i.e. 20% decrease in primary energy consumption by 2020 (EU2020) 30% decrease in primary energy consumption by 2050 respect to 2005 (Roadmap)	1000 tones of oil equivalent (kTOE)	2020 2050	1.646.839	1550000	1.474.000	1290000	884.400
Renewable Energy sources	EU2020	20% of total gross energy consumption from renewables in 2020	% of RES	2020	12,5%	15%	20,0%	36,1%	75,0% (RM2050 High RES Scenario)
Renewable Energy sources in transport	Renewable Energy Roadmap Communication by the EC, 2007	10% of transport energy from renewables in 2020	% of RES	2020	4,7%	7%	10%	17%	35%
Renewable Energy sources in transport	Regulation 443/2009 h	New vehicle car emissions: 95 g CO2/km target for 2020	gr CO2 / km	2020	140	130	95	60	30
Renewable Energy sources in transport	Transport White Paper 2011	40% use of sustainable fuel used in aviation *(IATA thinks a 6% share of sustainable 2nd generation biofuels is achievable by 2020; Boeing supports a target of 1% of global aviation fuels by 2015)*	% of sustainable fuel	2050	0%	1%	6%	20%	40%
Renewable Energy sources in transport	Transport White Paper 2011	40% cut in fuel emissions of the shipping industry	% of sustainable fuel	2050	5%	10%	17,5%	30%	40%
TRANSPORT TARGETS									
Passenger transport modal	Transport White Paper 2011	50% medium distance passenger transport shift to rail by 2050.	% rail in passenger·km	2050	8,30%	9,40%	12%	20%	50%
Freight transport modal shift	Transport White Paper 2011	30% freight transport >300km shift to rail or waterborne. 50% by 2050	% (rail + waterborne) in tonne·kilometre	2030 2050	15%	18%	21%	30%	50%
Trans European Networks TEN-T	Transport White Paper 2011	Multi-modal TEN-T core network by 2030	Km of motorways in core network	2030	29.950	31.000	33.000	35.899	35.899

Topic	Source	Target	Unit	Year of official target	2010	2015	2020	2030	2050
Trans European Networks TEN-T	Transport White Paper 2011	To triple the length of high-speed rail network by 2030. To complete a European high-speed rail network by 2050	Km of HSR	2030 2050	6.602	7.343	9.743	18.000	22.000
Trans European Networks TEN-T	Transport White Paper 2011	All core network airports connected to rail network by 2050, preferably by high-speed rail	Core airports connected to rail	2050	15	17	20	25	37
Trans European Networks TEN-T	Transport White Paper 2011	All core seaports sufficiently connected to the rail freight and, where possible, inland waterway system.	Core port connected to rail with adequate standards	2050	25	27	35	65	83
Clean urban transport	Transport White Paper 2011	Lower 50% the use of “conventionally-fueled” cars in urban transport by 2030 and 0% use of “conventionally-fueled” cars in urban transport by 2050	% Share of unconventionally fuelled cars	2030 2050	5%	10%	20%	50%	100%
Clean urban transport	Transport White Paper 2011	CO2 free logistics in cities by 2030	% Share of unconventionally fuelled delivery vehicles	2050	0%	5%	15%	50%	100%
Road fatalities	Transport White Paper 2011	By 2020, 50% fatalities in road transport compared to 2010. Close to zero fatalities in road transport by 2050.	Fatalities per million people	2030 2050	62	45	31	15	0
ENVIRONMENTAL TARGETS									
Air pollution	Roadmap to a Resource Efficient Europe (EC, 2011)	Concentrations of Particulate Matter (PM10) in ambient air, not exceeding 50µg/m3 per 24 hours more than 35 times a year	Number of PM10 events with concentration > 50µg/m3 per 24 hours, per year	2020	45	40	35	20	0
Air pollution	Thematic Strategy on Air Pollution	47% reduction in loss of life expectancy as a result of exposure to particulate matter	% reduction respect to 2005	2020	10%	25%	47%	75%	100%
Air pollution	Thematic Strategy on Air Pollution	10 % reduction in acute mortalities from exposure to ozone	% reduction respect to 2005	2020	5%	7,5%	10%	20%	60%
Air pollution	Thematic Strategy on Air Pollution	Reduction in excess acid deposition of 74% in forest areas	% reduction respect to 2005	2020	35%	55%	74%	95%	100%
Air pollution	Thematic Strategy on Air Pollution	Reduction in excess acid deposition of 39% in surface freshwater areas	% reduction respect to 2005	2020	10%	25%	39%	70%	100%

Topic	Source	Target	Unit	Year of official target	2010	2015	2020	2030	2050
Air pollution	Thematic Strategy on Air Pollution	43% reduction in areas or ecosystems exposed to eutrophication	% reduction respect to 2005	2020	10%	25%	43%	70%	100%
Air pollution	Thematic Strategy on Air Pollution	Reduction of air emissions: SO2 by 82%, NOx by 60%, volatile organic compounds by 51%, ammonia by 27%, and primary PM2.5 (particles emitted directly into the air) by 59%	Level of achievement of target	2020	0%	50%	100%	150%	200%
Water	Water Framework Directive	Restore degraded inland surface and ground waters to “good status”	% of good status water	2015	80%	100%	100%	100%	100%
Water	Roadmap to a Resource Efficient Europe (EC, 2011)	By 2020, good environmental status of all EU marine waters is achieved	% of good status water	2020	70%	85%	100%	100%	100%
Biodiversity	EU Biodiversity to 2020	100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and 50% more species assessments under the Birds Directive show a secure or improved status.	Level of achievement of target	2020	0%	50%	100%	150%	200%
Biodiversity	EU Biodiversity to 2020	ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems	Level of achievement of target	2020	0%	50%	100%	150%	200%
Biodiversity	EU Biodiversity to 2020	maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP	Level of achievement of target	2020	0%	50%	100%	150%	200%
Biodiversity	EU Biodiversity to 2020	Forest Management Plans are in place for all forests that are publicly owned and for forest above a certain size	Level of achievement of target	2020	0%	50%	100%	150%	200%
Biodiversity	EU Biodiversity to 2020	Invasive Alien Species and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction of ne ones.	Level of achievement of target	2020	0%	50%	100%	150%	200%

Topic	Source	Target	Unit	Year of official target	2010	2015	2020	2030	2050
Biodiversity	EU Biodiversity to 2020	the EU has stepped up its contribution to averting global biodiversity loss	Level of achievement of target	2020	0%	50%	100%	150%	200%
Recycling	The Roadmap to a Resource Efficient Europe - "The Roadmap"	50% of reuse/recycling of municipal waste	% of municipal waste	2020			50%	75%	100%
Recycling	The Roadmap to a Resource Efficient Europe - "The Roadmap"	70% of reuse/recycling/recovery of construction and demolition waste	% of construction waste	2020			70%	90%	100%

Figure 14 Territorial VISION faced with other policy targets

4. Annex 1 – Review of Policy Documents

4.1 Review of Existing Strategies: key directions and targets

Lisbon Treaty, in its Article 3 mentions three dimensions of cohesion: economic, social and territorial. Articles 158-162 (new 174-178) concern to economic, social and territorial cohesion.

There is pointed out in Article 174: "In order to promote its overall harmonious development, the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion. In particular the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions".

Article 175 concerns matters of cohesion report: "The Commission shall submit a report to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions every three years on the progress made towards achieving economic, social and territorial cohesion and on the manner in which the various means provided for in this Article have contributed to it. This report shall, if necessary, be accompanied by appropriate proposals".

It means that key cohesion policy document (cohesion report) produced until now in years: 1998, 2001, 2004, 2007,2010, next will be in April 2014 should propose analysis of cohesion using different indicators. For economic cohesion it was GDP using purchasing power parity, for social cohesion employment level, analysed on NUTS 2 level.

EU2020 Strategy

Based on analysis by ESPON Siesta project

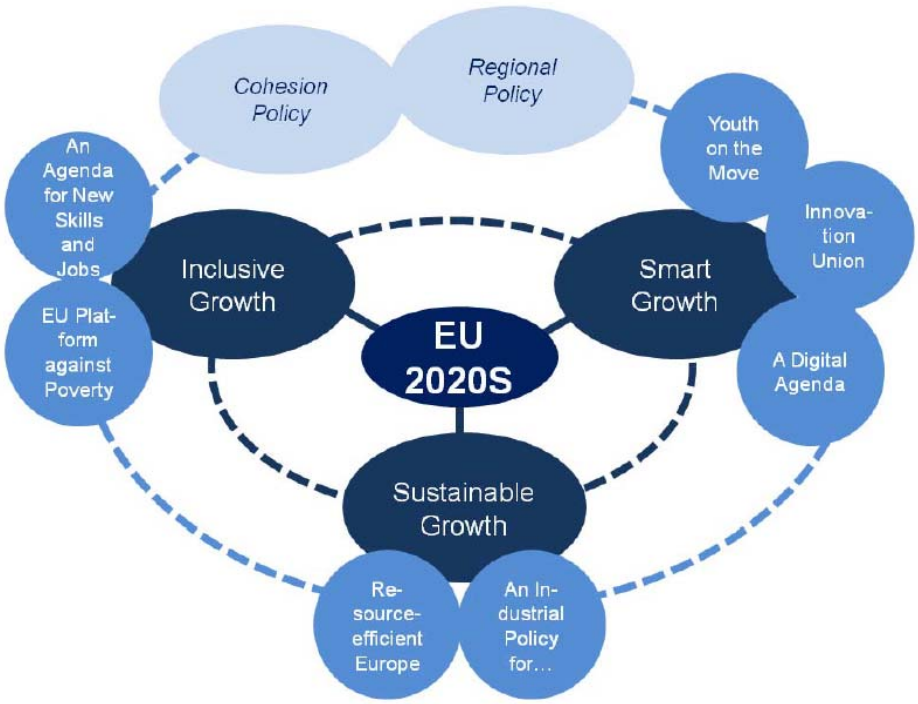
The Europe 2020 Strategy (EU2020S) was launched by the European Commission (EC) in November 2009 and discussed during the Spanish Presidency of the EU in the first semester of 2010 by different EU institutions (the Parliament, the Council of Ministers, etc.), with a first overall discussion held in the European Council meeting on the 25th-26th March 2010 in Brussels. The consolidated official document of the EU2020S constitutes a Communication from the Commission published in March 2010, and was finally adopted by the European Council on the 17th of June 2010 in a meeting held in Brussels.

The EU2020S has as meaningful subtitle “a strategy for smart, sustainable and inclusive growth”. The document contains a preface from the President of the EC stating that the context of “economic and financial crisis” has motivated the elaboration of this EU2020S for achieving “a sustainable future”, which is “about more jobs and better lives”, acknowledging that the EU “has the capability to deliver smart, sustainable and inclusive growth, to find the path to create more jobs and to offer a sense of direction to our societies”. These constitute the basic rationale of the EU2020S.

The EU2020S goes thematically beyond the previous Lisbon Strategy. The latter was focused on economic and smart growth (competitiveness and knowledge-based economy) and included several social issues (basically employment), but the former is more comprehensive.

The EU2020S consists of a double-folder of thematic organisation (Graphic 1.1): on the one hand, three priorities are launched; on the other, seven flagships are established. The priorities can be defined as the basic pillars or aims of the EU2020S, in an inter-related manner, as follows:

Graphic 1.1 The EU2020S from the perspective of the SIESTA Project



Source: ESPON SIESTA, 2012

Smart Growth: developing an economy based on knowledge and innovation.

Sustainable Growth: promoting a more resource efficient, greener and more competitive economy.

Inclusive Growth: fostering a high-employment economy delivering social and territorial cohesion.

In order to catalyse progress towards each one of the priorities, seven flagship initiatives have been put forward. These are key programmes or tools to foster the achievement of the EU2020S. The seven flagships are as follows:

- Innovation Union.
- A Digital Agenda for Europe.
- Youth on the Move.
- Resource Efficient Europe.
- An Industrial Policy for the Globalisation Era.
- An Agenda for New Skills and Jobs.
- European Platform against Poverty.

The seven flagships are clearly linked to the three major themes. Basically, the flagship initiatives are strategic programmes encouraged by the EC itself. These flagship initiatives are inter-related and are structured around the three reinforcing priorities. Each flagship has been established through as an official Communication from the EC.

Beyond priorities and flagship initiatives, the EU2020S consists of several headline targets that are set for achievement by 2020. In short, the EU2020S indicates the basic direction that the EU economy should follow and this track is intended to be measurable by means of some indicators, that is, the headline targets.

- 75% of the 20-64 year-old population to be employed.
- 3% of the EU's Gross Domestic Product to be invested in R&D.
- The three targets known as "20/20/20": a 20% reduction (and even 30% if possible) in greenhouse gas emissions in relation to 1990 levels, 20% of energy from renewable sources and a 20% increase in energy efficiency.
- Reducing early school leavers to below 10%.
- At least 40% of 30-34 year-old population completing third level education.
- At least 20 million fewer people in or at-risk-of-poverty and social exclusion.

	UNIT	REFERENCE PERIOD						TARGET	TABLE	
		2005	2009	2010	2011	2012	2013			
75% of the population aged 20-64 should be employed										
Employment rate - age group 20-64 Additional data (Show)	% of population aged 20-64	67.9	68.9	68.5	68.5	68.4	(:)	75		
3% of the EU's GDP should be invested in R&D										
Gross domestic expenditure on R&D	% of GDP	1.82	2.01(e)	2(e)	2.04(e)	2.06(e)	(:)	3		
Greenhouse gas emissions should be reduced by 20% compared to 1990 The share of renewable energy sources in final energy consumption should be increased to 20% Energy efficiency should improve by 20%										
Greenhouse gas emissions	Index 1990 = 100	93.24	83.78	85.74	83.07	(:)	(:)	(:)		
Share of renewable energy in gross final energy consumption	%	8.5	11.6	12.5	13.0	(:)	(:)	20		
Primary energy consumption Additional data (Show)	million tonnes of oil equivalent (TOE)	1711.0	1600.6	1652.6	1591.0	(:)	(:)	1483		
Final energy consumption Additional data (Show)	million tonnes of oil equivalent (TOE)	1198.2	1116.5	1158.8	1109.4	(:)	(:)	1086		
The share of early school leavers should be under 10% and at least 40% of 30-34 years old should have completed a tertiary or equivalent education										
Early leavers from education and training Additional data (Show)	% of population aged 18-24	15.7	14.2	13.9	13.4	12.7	(:)	10(d)		
Tertiary educational attainment Additional data (Show)	% of population aged 30-34	27.9	32.1	33.4	34.5	35.7	(:)	40(d)		
Poverty should be reduced by lifting at least 20 million people out of the risk of poverty or social exclusion										
People at risk of poverty or social exclusion(1) Additional data (Show)	Thousand	(:)	(:)	118123	121542	124477(e)	(:)	(:)		
People living in households with very low work intensity Additional data (Show)	Thousand	(:)	(:)	38670	39465	39431(e)	(:)	(:)		
People at risk of poverty after social transfers Additional data (Show)	Thousand	(:)	(:)	81960	84586	84999(e)	(:)	(:)		
People severely materially deprived Additional data (Show)	Thousand	(:)	(:)	41880	44362	49671(e)	(:)	(:)		

Last update: 05/02/2014 11:05:01

(1) People are counted only once even if they are present in more than one sub-indicator
(d) See the pdf document here

Flags and Special values for data: please visit the Information page

Green Paper on Territorial Cohesion (Brussels 2008)

COM(2008) 616 final
http://ec.europa.eu/regional_policy/archive/consultation/terco/paper_terco_en.pdf

Territorial cohesion is about ensuring the harmonious development of all these places and about making sure that their citizens are able to make the most of inherent features of these territories that contributes to sustainable development of the entire EU.

Through its objective of promoting harmonious or balanced development, territorial cohesion has a solidarity dimension, arguing for the reduction of territorial disparities and working for fair access to opportunities. In this sense the economic objective of achieving the proper functioning of the single market ties in with the current development rationale of Cohesion Policy.

- Untapping the territorial capital: competitiveness and prosperity depend on the capacity of the people and businesses to make the best use of all of territorial assets. Public policy can help territories in making this the best use of their assets

- Integrated bottom-up approach: integrated approach and cooperation between the various authorities and stakeholders involved. multi-sectoral, dialogue and partnership between different levels of government and between these and organisations and people on the ground directly involved in the development process

- Place based approach: growing awareness of the need to frame development strategies around the particular assets of territories, their physical, human and social capital as well as their natural resources

- Polycentrism and the urban-rural partnership: settlement patterns in Europe, with networks of dense medium sized cities and towns in a relatively naturalised landscape, contribute to the quality of life in the EU two-fold: for city dwellers living close to rural areas; and those rural residents within easy reach of services (urban-rural partnership); It is more resource-efficient because it avoids the diseconomies of very large agglomerations and urban sprawl.

- Recognition of regions with specific geographical features: Three specific types of region in some cases face particular development challenges: mountain, island (including outermost regions) and 18 sparsely populated areas (SPA). Most of these regions are bordering and rural.

- Balanced economy: the pattern of economic activity is far more uneven than the pattern of settlements. There are economic gains from the concentration of activity, but also costs from congestion, high property prices, social exclusion and pollution. Economic activity has become more evenly spread across the EU in the past decade due to the high growth in Ireland, Spain and the new Member States.

Territorial cohesion certainly does not mean automatic compensation based on particular geographic situations. On the other hand it can imply that public policies might be more responsive to the different needs and potentials of all kinds of territories across Europe. That is to say that the territorial dimension needs to be reinforced at all levels and at all stages in policy design and implementation.

Within this area of the debate there was consensus on the following 6 strands:

1. Coordinated public policies at different levels
2. Better account of territorial impacts
3. Improved multi-level governance
4. The need for functional approaches - regions yes, but also consideration of other geographies where appropriate; river basins, mountain areas, networks of towns, metropolitan areas, deprived neighbourhoods for example. A question of flexibility.
5. Territorial cooperation as a clear EU asset
6. Reinforced evidence base - better territorial knowledge is needed

The importance of territorial cohesion was highlighted in the Community Strategic Guidelines on Cohesion[4] adopted by the Council in 2006, which stated that "promoting territorial cohesion should be part of the effort to ensure that all of Europe's territory has the opportunity to contribute to the growth and jobs agenda". Community Strategic Guidelines on Rural Development[5] highlight the contribution which EU rural development programmes can make to pursuing territorial cohesion.

Objectives of territorial strategies in Europe, according to the Green Paper on territorial cohesion:

- Concentration: overcoming differences in density. The key challenge is to avoid excessive concentrations of growth and facilitating the access to the increasing returns of agglomeration in all territories. Intermediate regions can benefit from increasing returns if they create a strong network of cities and towns and develop their strengths in a coordinated manner.

- Connecting territories: overcoming distance. Connecting territories today means more than ensuring good intermodal transport connections. It also requires adequate access to services such as health care, education and sustainable energy, broadband internet access, reliable connections to energy networks and strong links between business and research centres[6].

- Cooperation: overcoming division[7]. Multiple co-operation structures involving different types of public and private actor. Cooperation on variable geographical scales. Cross-border cooperation. Coherent policies for infrastructure and economic cooperation between neighbouring former eastern and western European countries. External border regions cooperation. .

Territorial cohesion in the programming of EU policies

- Transport policy: improving connections to and within less developed regions

[4] Official Journal L 291, 21.10.2006, p. 29

[5] Official Journal L 55, 25.02.2006, p.26

[6] In the new Member States driving between cities takes much longer than in the EU15; in most new Member States railway lines cannot handle high speeds and are often in need of repair; uneven quality of secondary road networks and public transport; transport by sea remains under-developed; reliable access to energy; interconnection of electric networks, renewable energy and energy efficiency; in remote regions, 40% of people on average live more than a 30-minute drive from a hospital and 43% live more than a hour drive from a university; ICT to provide access to health care and education; In 2007, household access to broadband internet at home is on average 15% lower in rural areas than in urban areas

[7] Eurometropole Lille-Kortrijk-Tournai; EUREGIO Rhein- Waal created by German and Dutch local authorities

- Energy policy: fully integrated internal gas and electricity market; renewable energies to increase self-sufficiency of Europe, especially of isolated areas
- Internet deployment: growing importance for competitiveness and social cohesion
- CAP 1st Pillar: maintains activities and incomes in rural areas, and promotes sound land management.
- European Employment Strategy: development of human capital through better education and the acquiring of new skills in different territories
- Maritime policy: an integrated maritime policy to ensure sustainable and compatible development across marine areas (fisheries, aquaculture, biodiversity, shipping, oil&gas, mining).
- Environmental policy: impacts on the location of economic activity
- Research: the establishment of the European Research Area (ERA) opens the possibility to participate in transnational projects with an increasingly important effect on regional development
- Regional aid: Competition policy can affect the territorial distribution of economic activity by ensuring that regional aid is concentrated in the most disadvantaged areas and by adjusting the intensity of aid allowed to the nature and scale of problems

Territorial Agenda Of The European Union 2020 (Gödöllö 2011)

Towards an Inclusive, Smart and Sustainable Europe of Diverse Regions

Six (6) Challenges and potentials for territorial development

1. Increased exposure to globalisation: structural changes after the global economic crisis
2. Challenges of EU integration and the growing interdependences of regions
3. Territorially diverse demographic and social challenges, segregation of vulnerable groups
4. Climate change and environmental risks: geographically diverse impacts
5. Energy challenges come to the fore and threaten regional competitiveness
6. Loss of biodiversity, vulnerable natural, landscape and cultural heritage

Six (6) Territorial Priorities for the Development of the European Union

1. Promote polycentric and balanced territorial development
2. Encouraging integrated development in cities, rural and specific regions
3. Territorial integration in cross-border and transnational functional regions
4. Ensuring global competitiveness of the regions based on strong local economies
5. Improving territorial connectivity for individuals, communities and enterprises
6. Managing and connecting ecological, landscape and cultural values of regions

Making EU territorial cohesion a reality

- The governance and implementation mechanisms.
- Territorial coordination of policies
- Territorial cohesion implementation mechanisms
    a. Strengthening territorial cohesion at EU level
    b. Contributing to territorial cohesion at cross□border, transnational, and inter-regional level
    c. Strengthening Member States' contribution to territorial cohesion

4.2 Review of Existing Roadmaps: key directions and targets

A Roadmap for moving to a competitive low carbon economy in 2050

COM(2011) 112 final

Together with the White Paper on Transport and the Energy Efficiency Plan, this Communication is a key deliverable under the Resource Efficiency Flagship[8]. It presents a Roadmap for possible action up to 2050 which could enable the EU to deliver greenhouse gas reductions in line with the 80 to 95% target agreed.

The Europe 2020 Strategy for smart, sustainable and inclusive growth includes five headline targets that set out where the EU should be in 2020. One of them relates to climate and energy: Member States have committed themselves to reducing greenhouse gas emissions (GHG) by 20%, increasing the share of renewables in the EU's energy mix to 20%, and achieving the 20% energy efficiency target by 2020. The EU is currently on track to meet two of those targets, but will not meet its energy efficiency target unless further efforts are made[9]. Hence, the priority remains to achieve all the targets already set for 2020.

Milestones to 2050

The transition towards a competitive low carbon economy means that the EU should prepare for reductions in its *domestic* emissions by 80% by 2050 compared to 1990[10]. This analysis of different scenarios shows that domestic emission reductions of the order of 40% and 60% below 1990 levels would be the cost-effective pathway by 2030 and 2040, respectively. In this context, it also shows reductions of 25% in 2020.

Such a pathway would result in annual reductions compared to 1990 of roughly 1% in the first decade until 2020, 1.5% in the second decade from 2020 until 2030, and 2 % in the last two decades until 2050.

If the EU delivers on its current policies, including its commitment to reach 20% renewables, and achieve 20% energy efficiency by 2020, this would enable the EU to outperform the current 20% emission reduction target and achieve a 25% reduction by 2020.

The analysis also shows that a less ambitious pathway could lock in carbon intensive investments, resulting in higher carbon prices later on and significantly higher overall costs over the entire period.

Table 1: Sectoral reductions

GHG reductions compared to 1990	2005	2030	2050
Total	-7%	-40 to -44%	-79 to -82%
Sectors			
Power (CO_2)	-7%	-54 to -68%	-93 to -99%
Industry (CO_2)	-20%	-34 to -40%	-83 to -87%
Transport (incl. CO2 aviation, excl. maritime)	+30%	+20 to -9%	-54 to -67%
Residential and services (CO_2)	-12%	-37 to -53%	-88 to-91%
Agriculture (non-CO_2)	-20%	-36 to -37%	-42 to -49%

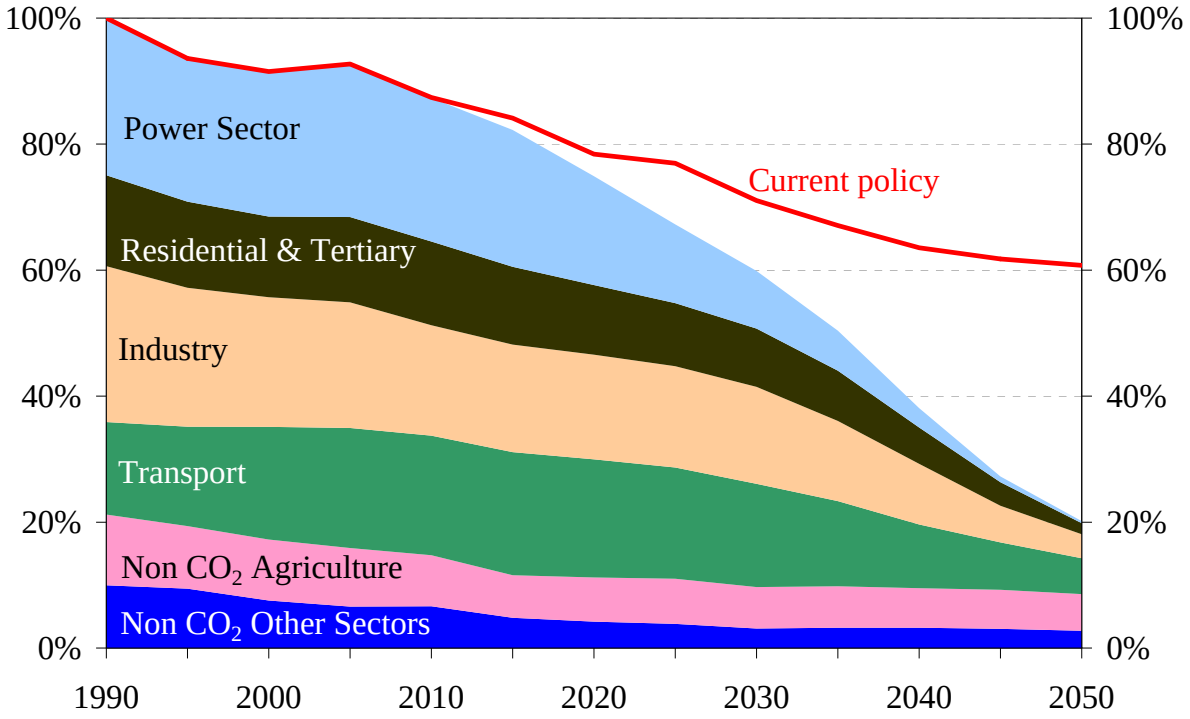
8 COM(2011) 21, see: http://ec.europa.eu/resource-efficient-europe

9 Energy Efficiency Plan - COM(2011) 109.

10 Domestic meaning real internal reductions of EU emissions and not offsetting through the carbon market.

Other non-CO_2 emissions	-30%	-72 to -73%	-70 to -78%

Figure 1: EU GHG emissions towards an 80% domestic reduction (100% =1990)



Investing in a low carbon future

On average over the coming 40 years, the increase in public and private investment is calculated to amount to around € 270 billion annually. This represents an additional investment of around 1.5% of EU GDP per annum on top of the overall current investment representing 19% of GDP in 2009[11]. It would take us back to the investment levels before the economic crisis.

In this context, it is interesting to note the much larger shares of GDP allocated to investments in China (48%), India (35%), and Korea (26%) in 2009[12], showing emerging economies' need to build up infrastructure but also the potential in leapfrogging towards a competitive, low carbon economy.

Economic Savings from decreased emissions

Taken over the whole 40-year period, it is estimated that energy efficiency and the switch to domestically produced low carbon energy sources will reduce the EU's:

- In 2050, the EU's total primary energy consumption could be about 30% below 2005 levels. Average fuel costs by between € 175 billion and € 320 billion per year.
- In 2030, annual costs of controlling traditional air pollutants could be more than € 10 billion lower, and in 2050 close to € 50 billion could be saved every year.
- Reduced mortality would bring benefits estimated up to € 17 billion per year in 2030, and up to € 38 billion in 2050.

11 Eurostat, National accounts.

12 World Bank, Indicators.

Energy Efficiency Plan 2011

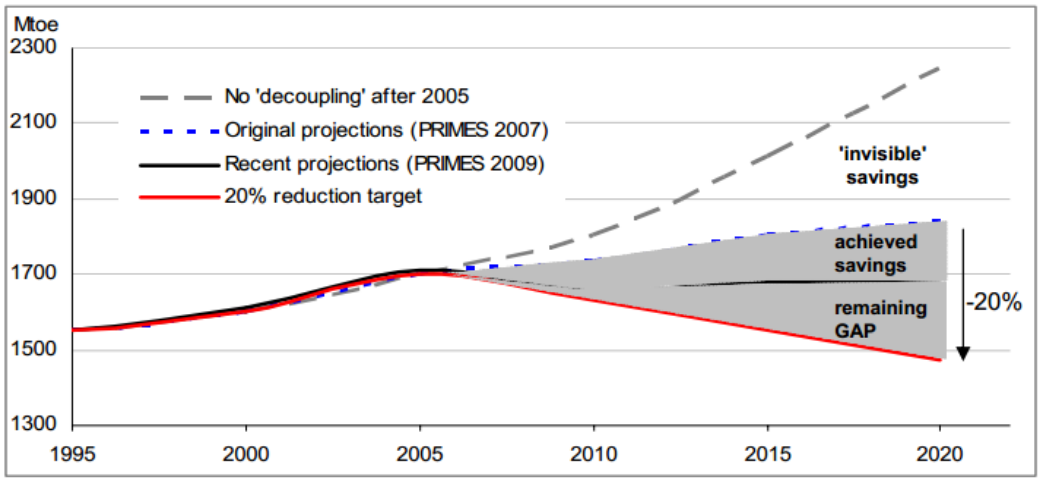
COM(2011) 109 final

Energy efficiency[13] is one of the most cost effective ways to enhance security of energy supply, and to reduce emissions of greenhouse gases and other pollutants. Energy efficiency can be seen as Europe's biggest energy resource.[14]

The Union has set itself a target for 2020 of saving 20% of its primary energy consumption compared to projections[15], which translates into a saving of 368 million tons of oil equivalent (Mtoe) of primary energy (gross inland consumption minus non-energy uses) by 2020 compared to projected consumption in that year of 1842 Mtoe.

Recent Commission estimates suggest that the EU is on course to achieve only half of the 20% objective[16].

Figure 4. Development and projection of primary energy use for the EU by 2020



The combined effects of full implementation of the existing and new measures will transform our daily life and have the potential to generate financial savings of up to € 1 000 per household[17] every year; improve Europe's industrial competitiveness; create up to 2 million jobs[18]; and reduce annual greenhouse gas emissions by 740 million tons[19].

---

13 Technically, 'energy efficiency' means using less energy inputs while maintaining an equivalent level of economic activity or service; 'energy saving' is a broader concept that also includes consumption reduction through behaviour change or decreased economic activity. In practice the two are difficult to disentangle and – as in this Communication – the terms are often used interchangeably.

14 "Negajoules" are the energy consumption avoided through enhanced energy efficiency. For example, the 13% improvement in the energy efficiency of final consumers that took place in the EU27 between 1996 and 2007 was equivalent to energy savings of about 160 Mtoe over the period (Overall Energy Efficiency Trends and Policies in the EU27 - ADEME 2009).

15 7224/1/07 REV 1: Presidency Conclusions of the European Council of 8/9 March 2007. This objective translates into a saving of 368 million tons of oil equivalent (Mtoe) of primary energy (gross inland consumption minus non-energy uses) by 2020 compared to projected consumption in that year of 1842 Mtoe. This objective was reconfirmed by the June 2010 European Council (17/6/2010 Nr: EUCO 13/10).

16 According to the most recent Commission estimates and taking into account energy efficiency measures implemented up to December 2009.

17 COM(2008) 772: Communication from the Commission: Energy efficiency: delivering the 20% target

18 Estimates based on data for the building sector. See SEC(2011) 277: Impact Assessment accompanying the Energy Efficiency Plan

19 SEC(2011) 277: Impact Assessment accompanying the Energy Efficiency Plan.

Public sector: leading by example

Public spending accounts for 17% of EU GDP. Publicly owned or occupied buildings represent about 12% by area of the EU building stock.

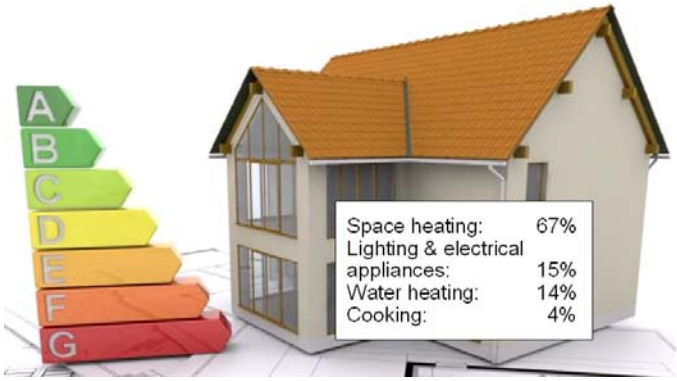
- high standards of energy efficiency to purchase goods (e.g. ICT equipment), services (e.g. energy) and works (e.g. refurbishment of buildings).
- public authorities will be required to refurbish at least 3% of their buildings (by floor area) each year – about twice the currently prevailing rate for the European building stock[20]. Each refurbishment should bring the building up to the level of the best 10% of the national building stock.
- The Commission will continue to support the local approach to energy efficiency through the Covenant of Mayors
- In 2011 it will launch a new Smart Cities and Smart Communities initiative

Low energy consuming buildings

Nearly 40%[21] of final energy consumption is in houses, public and private offices, shops and other buildings. In residential homes, 67% of this is for space heating. A large energy saving potential remains untapped.

- Energy efficient building solutions are often technically demanding. About 1.1 million qualified workers are available, while it is estimated that 2.5 million will be needed by 2015[22].
- Energy Service Companies (ESCOs) deliver energy efficiency improvements, accepting financial risk by covering – or helping to finance - upfront investment costs and refinancing this through the savings achieved. The EC will propose that MS provide market overviews, lists of accredited energy service providers and model contracts.

Figure: EU-27 households' energy consumption at home, %



Source: Odyssee indicators, www.buildup.eu

Efficient generation of heat and electricity

About 30% of the EU's primary energy consumption is consumed by the energy sector, mainly for transforming energy into electricity and heat and for distributing it.

- New generation capacity and infrastructure need to be built to replace ageing equipment and meet demand[23].

---

20 This percentage applies at Member States level. The current rate of refurbishment lies between 1.2% and 1.5% per year for EU27. The upper end of the range reflects the retrofit rate of buildings above 1000 m², which is the case for most public buildings and explains why a doubling of the current rate leads to 3%. See footnote 19 and SEC(2008) 2865.

21 In 2008. See Eurostat, Energy, transport and environment indicators, 2010 edition.

22 Ex-ante evaluation of the initiative on the building workforce training and qualification in the field of energy efficiency and renewable energy within the Intelligent Energy Europe Programme. See Ecorys, Ecofys and BioIntelligence (2010): Study to Support the Impact Assessment for the EU Energy Saving Action Plan, p. 34.

23 COM(2010) 677/4: Communication from the Commission: Energy Infrastructure priorities for 2020 and beyond - A Blueprint for an integrated European energy network.

- Exploring ways to tackle the effective recovery of heat losses from electricity and industrial production processes will be another important task for the Commission, since unused energy saving potential is far from being exhausted and could cover a significant part of Europe's thermal energy needs
- Greater use of (high-efficiency) cogeneration, including from municipal waste treatment plants, and district heating and cooling can make an important contribution to energy efficiency.

Energy efficiency in electricity and gas networks

The EC will strengthen the basis for national grid regulators to take energy efficiency into account in their decisions and in monitoring the management and operation of gas and electricity grids and markets

European manufacturing industry

About 20%[24] of the EU's primary energy consumption is accounted for by industry. This is the sector where progress in energy efficiency has been greatest (with a 30% improvement in energy intensity over 20 years).

- For large **companies** the Commission will propose to make regular energy audits mandatory
- the Commission is investigating whether and which **energy performance (ecodesign) requirements** would be suitable for standard industrial equipment such as industrial motors, large pumps, compressed air, drying, melting, casting, distillation and furnaces.
- to encourage **voluntary agreements** on implementing energy efficiency processes and systems

[24] In 2008. See Eurostat, Energy, transport and environment indicators, 2010 edition.

Roadmap to Resource Efficient Europe

COM(2011) 571 Final

The Vision: By 2050 the EU's economy has grown in a way that respects resource constraints and planetary boundaries, thus contributing to global economic transformation. Our economy is competitive, inclusive and provides a high standard of living with much lower environmental impacts. All resources are sustainably managed, from raw materials to energy, water, air, land and soil. Climate change milestones have been reached, while biodiversity and the ecosystem services it underpins have been protected, valued and substantially restored.

Resource efficient development is the route to this vision.

It allows the economy to create more with less, delivering greater value with less input (efficiency), using resources in a sustainable way and minimising their impacts on the environment (environmentally friendly).

It will also require that residual waste is close to zero and that ecosystems have been restored, and systemic risks to the economy from the environment have been understood and avoided.

A new wave of innovation will be required.

In order to launch this process, two levels of indicators are provisionally formulated[25]:

(1) A provisional lead indicator - **"Resource Productivity"** - to measure the principal objective of this Roadmap, of improving economic performance while reducing pressure on natural resources;

(2) A series of **complementary indicators** on key natural resources such as water, land, materials and carbon, that will take account of the EU's global consumption of these resources.

Annex II to the Roadmap suggests for the following key indicators the following quantitative targets, which are not adopted in the Roadmap itself however.

- *Resource productivity*: Measured by the ratio of GDP to Domestic Material Consumption (expressed in Euro/tonne). The EU average was around 1.30 €/tonne in 2007, ranging from below 0.3 to around 2.5. Resource productivity in 2007 has increased with 7.4% in comparison with 2000. However, in order to achieve absolute decoupling of economic growth from resource use, resource productivity needs to grow equally to or faster than GDP, which has not been the case. GDP has grown with 16.2% over the same period while DMC has grown 7.9%. An absolute decoupling would mean that DMC should remain constant or decrease.
- *Land*: Artificial land has continued to expand; in the period 2000-2006 at a rate of 920 km² per year. To reach a state of no net land take by 2050 and assuming a linear reduction from now until then, the average annual land take needs to decease to maximum 800 km² per year in the period 2010-2020.
- *Water*: Trends in EU average values of the water exploitation index (WEI) have been stagnating around 13% for the past 20 years. However WEI national values vary from 64% to less than 1% and decreases of WEI are rare. Values above 20% are considered unsustainable.
- *GHG emissions*: After an initial decline starting from the baseline in 1990, GHG emissions were for almost stable for a decade. Recently a further decline was observed, reaching 17.4% reduction (compared to 1990) in 2009 (the Kyoto Protocol requires the EU to reduce green-

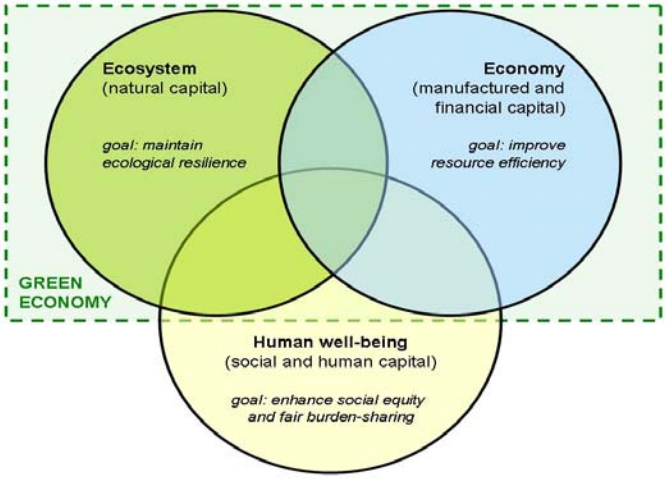
[25] As set out in the accompanying COM(2011) 571.

house gas emissions by 8% below 1990 levels by 2008-2012). The challenge will be to keep this trend also in the period of economic recovery as the EU target for 2020 is a 20% reduction (30% if the conditions are right).

Domestic Material Consumption (DMC) to remain constant or decrease (*Resource productivity)*
Average annual land take, from additional 920 km2 per year in 2000-2006, to 800km2 in 2010-2020 and 0km2 by 2050 (*Land*)
Water Exploitation Index (WEI) in all European countries to below 20% level (*Water*)
GHG Emissions, 20% below 1990 by 2020 (30% if the conditions are right)

TRANSFORMING THE ECONOMY

Transforming the economy onto a resource-efficient path will bring increased competitiveness and new sources of growth and jobs through cost savings from improved efficiency, commercialisation of innovations and better management of resources over their whole life cycle.



Source: European Environment Agency

Sustainable Consumption

- **Milestone**: By 2020, citizens and public authorities have the right incentives to choose the most resource efficient products and services, through appropriate price signals and clear environmental information. Their purchasing choices will stimulate companies to innovate and to supply more resource efficient goods and services. Minimum environmental performance standards are set to remove the least resource efficient and most polluting products from the market. Consumer demand is high for more sustainable products and services.
- **Milestone**: By 2020, market and policy incentives that reward business investments in efficiency are in place. These incentives have stimulated new innovations in resource efficient production methods that are widely used. All companies, and their investors, can measure and benchmark their lifecycle resource efficiency. Economic growth and wellbeing is decoupled from resource inputs and come primarily from increases in the value of products and associated services.
- **Milestone**: By 2020, waste is managed as a resource. Waste generated per capita is in absolute decline. Recycling and re-use of waste are economically attractive options for public and private actors due to widespread separate collection and the development of functional mar-

kets for secondary raw materials. More materials, including materials having a significant impact on the environment and critical raw materials, are recycled. Waste legislation is fully implemented. Illegal shipments of waste have been eradicated. Energy recovery is limited to non recyclable materials, landfilling is virtually eliminated and high quality recycling is ensured.

Supporting research and innovation

- **Milestone**: By 2020, scientific breakthroughs and sustained innovation efforts have dramatically improved how we understand, manage, reduce the use, reuse, recycle, substitute and safeguard and value resources. This has been made possible by substantial increases in investment, coherence in addressing the societal challenge of resource efficiency, climate change and resilience, and in gains from smart specialization and cooperation within the European research area.

Environmentally harmful subsidies and getting the prices right

- **Milestone**: By 2020 EHS will be phased out, with due regard to the impact on people in need.
- **Milestone:** By 2020 a major shift from taxation of labour towards environmental taxation, including through regular adjustments in real rates, will lead to a substantial increase in the share of environmental taxes in public revenues, in line with the best practice of Member States.

Proposed Targets (non-officially adopted)

- % of the value, and number, of public procurement contracts that include Green Public Procurement (GPP) criteria → target to be defined
- Number and value of green products purchased by households→ target to be defined
- % companies within priority sectors which measure their environmental footprint → target to be defined by 2020
- Number of known 'substances of very high concern' (SVHC) included on the REACH Candidate list, from 53 in 2008 to 136 in 2012 and all relevant SVHC by 2020.
- Waste prevention → target to be defined
- Reuse and recycling – the existing targets of 50% of reuse/recycling of municipal waste and 70% of reuse/recycling/recovery of construction and demolition waste by 2020 will be reviewed and potentially raised to their maximum feasible level.
- Number and value of funding (€/year) of research and innovation projects promoting mainly resource efficiency and sustainable environmental management, allocated through European financial support programmes → target to be defined
- Environmentally Harmful Subsidies (EHS) phased out completely by 2020
- By 2020 the share of environmental taxation in public revenues (% of environmental taxes as share of total taxes and social contributions) will have been increased to an EU average of more than 10%.

NATURAL CAPITAL AND ECOSYSTEM SERVICES

Ecosystem services

- **Milestone:** By 2020 natural capital and ecosystem services will be properly valued and accounted for by public authorities and businesses.

Biodiversity

- **Milestone:** By 2020 the loss of biodiversity in the EU and the degradation of ecosystem services will be halted and, as far as feasible, biodiversity will be restored

Water

- **Milestone:** By 2020, all WFD River Basin Management Plans (RBMPs) have long been implemented. Good status – quality, quantity and use - of waters was attained in all EU river basins in 2015. The impacts of droughts and floods are minimised, with adapted crops, increased water retention in soils and efficient irrigation. Alternative water supply options are only relied upon when all cheaper savings opportunities are taken. Water abstraction should stay below 20% of available renewable water resources.

Air

- **Milestone:** By 2020, the EU's interim air quality standards will have been met, including in urban hot spots, and those standards will have been updated and additional measures defined to further close the gap to the ultimate goal of achieving levels of air quality that do not cause significant impacts on health and the environment.

Land and soils

- **Milestone:** By 2020, EU policies take into account their direct and indirect impact on land use in the EU and globally, and the rate of land take is on track with an aim to achieve no net land take by 2050; soil erosion is reduced and the soil organic matter increased, with remedial work on contaminated sites well underway.

Marine resources

- **Milestone:** By 2020, good environmental status of all EU marine waters is achieved, and by 2015 fishing is within maximum sustainable yields.

Proposed Targets (non-officially adopted)

- Map and assess the state of ecosystems and their services in Member States territory by 2014→ target to be defined
- Assess the economic value of such services, and integrate these values into accounting and reporting systems at EU and national level by 2020. → target to be defined
- Establishing sufficient functional green infrastructure in all MS for maintaining and enhancing ecosystems and their services
- At least 15% of degraded ecosystems restored by 2020
- Resource productivity of minerals and metals (GDP/DMC minerals+metals) → target to be defined
- good status of waters is attained in all EU river basins in 2015, and good quality and quantities of water will be ensured by 2020, as regards to Water Framework Directive
- River Basin Management Plans (RBMPs) implemented by 2012
- Concentrations of Particulate Matter (PM10) in ambient air, not exceeding 50µg/m3 per 24 hours more than 35 times a year
- Annual land take (i.e. the increase of artificial land) does not exceed 800 km² per year at the EU level by 2020.
- The area of land in the EU that is subject to soil erosion of more than 10 tonnes per hectare per year should be reduced by at least 25% by 2020
- By 2020 soil organic matter levels do not decrease overall and increase for soils currently with less than 3.5% organic matter
- Member States should have started undertaking remediation actions on identified contaminated sites by 2020
- At least 10% of the marine EU area is covered by a coherent network of (Marine Protected Areas) MPAs

KEY SECTORS

Addressing food

- **Milestone**: By 2020, incentives to healthier and more sustainable food production and consumption will be widespread and will have driven a 20% reduction in the food chain's resource inputs. Disposal of edible food waste should have been halved in the EU.

Improving buildings

- **Milestone:** By 2020 the renovation and construction of buildings and infrastructure will be made to high resource efficiency levels. The Life-cycle approach will be widely applied; all new buildings will be nearly zero-energy[26]and highly material efficient, and policies for renovating the existing building stock will be in place[27] so that it is cost-efficiently refurbished at a rate of 2% per year. 70% of non-hazardous construction and demolition waste will be recycled[28.]

Ensuring efficient mobility

- **Milestone:** By 2020 overall efficiency in the transport sector will deliver greater value with optimal use of resources like raw materials, energy, and land, and reduced impacts on climate change, air pollution, noise, health, accidents, biodiversity and ecosystem degradation. Transport will use less and cleaner energy, better exploit a modern infrastructure and reduce its negative impact on the environment and key natural assets like water, land and ecosystems. There will be on average a 1% yearly reduction, beginning in 2012, in transport GHG emissions.

Proposed Targets (non-officially adopted)

- Amount of animal proteins (including meat and dairy products) consumed per person is in line with WHO recommendations
- Decrease of edible food waste in households, retailers and catering by 50% in the EU.
- Member States shall ensure that by 31 December 2020, all new buildings are nearly zero-energy buildings; and after 31 December 2018, new buildings occupied and owned by public authorities are near zero-energy buildings
- The Transport White Paper proposes a target to decrease GHG by 60% in transport sector by 2050

GOVERNANCE AND MONITORING

New pathways to action on resource efficiency

- **Milestone:** By 2020 stakeholders at all levels will be mobilised to ensure that policy, financing, investment, research and innovation are coherent and mutually reinforcing. Ambitious resource efficiency targets and robust, timely indicators will guide public and private decision-makers in the transformation of the economy towards greater resource efficiency.

Supporting resource efficiency internationally

- **Milestone:** By 2020 resource efficiency will be a shared objective of the international community, and progress will have been made towards it based on the approaches agreed in Rio.

Improving the delivery of benefits from EU environmental measures

- **Milestone:** By 2020 the benefits from EU environmental legislation will be fully delivered.

Proposed Targets (non-officially adopted)

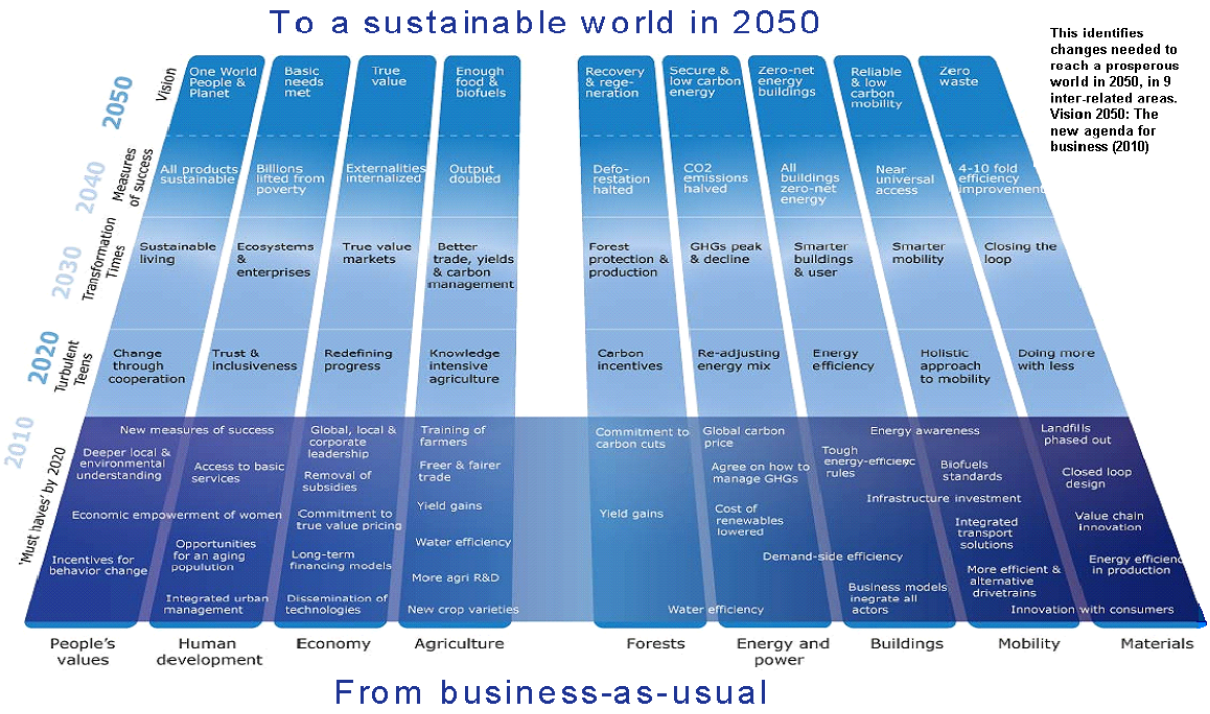
- 30% of the EU Regional Budget (i.e. cohesion policy budget) allocated to environment related expenditure

---

26 Directive 2010/31/EU.

27 In line with Art. 9 of Directive 2010/31/EU of 19 May 2010.

28 In line with Art 11 of Directive 2008/98/EC.


To a sustainable world in 2050
This identifies changes needed to reach a prosperous world in 2050, in 9 inter-related areas. Vision 2050: The new agenda for business (2010)
2050
Vision
2040
Measures of success
2030
Transformation Times
2020
Turbulent Teens
2010
'Must haves' by 2020
One World People & Planet
Basic needs met
True value
Enough food & biofuels
Recovery & rege-neration
Secure & low carbon energy
Zero-net energy buildings
Reliable & low carbon mobility
Zero waste
All products sustainable
Billions lifted from poverty
Externalities internalized
Output doubled
Defo-restation halted
CO2 emissions halved
All buildings zero-net energy
Near universal access
4-10 fold efficiency improvement
Sustainable living
Ecosystems & enterprises
True value markets
Better trade, yields & carbon management
Forest protection & production
GHGs peak & decline
Smarter buildings & user
Smarter mobility
Closing the loop
Change through cooperation
Trust & inclusiveness
Redefining progress
Knowledge intensive agriculture
Carbon incentives
Re-adjusting energy mix
Energy efficiency
Holistic approach to mobility
Doing more with less
New measures of success
Deeper local & environmental understanding
Access to basic services
Economic empowerment of women
Incentives for behavior change
Opportunities for an aging population
Integrated urban management
Global, local & corporate leadership
Removal of subsidies
Commitment to true value pricing
Long-term financing models
Dissemination of technologies
Training of farmers
Freer & fairer trade
Yield gains
Water efficiency
More agri R&D
New crop varieties
Commitment to carbon cuts
Yield gains
Water efficiency
Global carbon price
Agree on how to manage GHGs
Cost of renewables lowered
Demand-side efficiency
Energy awareness
Tough energy-efficiency rules
Biofuels standards
Infrastructure investment
Business models integrate all actors
Integrated transport solutions
More efficient & alternative drivetrains
Innovation with consumers
Landfills phased out
Closed loop design
Value chain innovation
Energy efficiency in production
People's values
Human development
Economy
Agriculture
Forests
Energy and power
Buildings
Mobility
Materials
From business-as-usual

Energy Roadmap 2050

COM(2011) 885 final

In this **Energy Roadmap 2050** the Commission explores the challenges posed by delivering the EU's decarbonisation objective while at the same time ensuring **security of energy supply** and **competitiveness.**

The EU is committed to reducing greenhouse gas emissions to 80-95% below 1990 levels by 2050 in the context of necessary reductions by developed countries as a group[29]. The Commission analysed the implications of this in its "Roadmap for moving to a competitive low-carbon economy in 2050".[30] The "Roadmap to a Single European Transport Area"[31] focussed on solutions for the transport sector and on creating a Single European Transport Area.

Uncertainty is a major barrier to investment: It is impossible to anticipate whether an oil peak will come, since new discoveries have occurred repeatedly; to what extent shale gas in Europe will prove viable, whether and when Carbon Capture & Storage (CCS) will become commercial, what role Member States will seek for nuclear power, how climate action across the globe will evolve. Social, technological and behavioural changes will also have significant impact on the energy system.

The Roadmap does not replace national, regional and local efforts to modernize energy supply, but seeks to **develop a long-term European technology-neutral framework** in which these policies will be more effective.

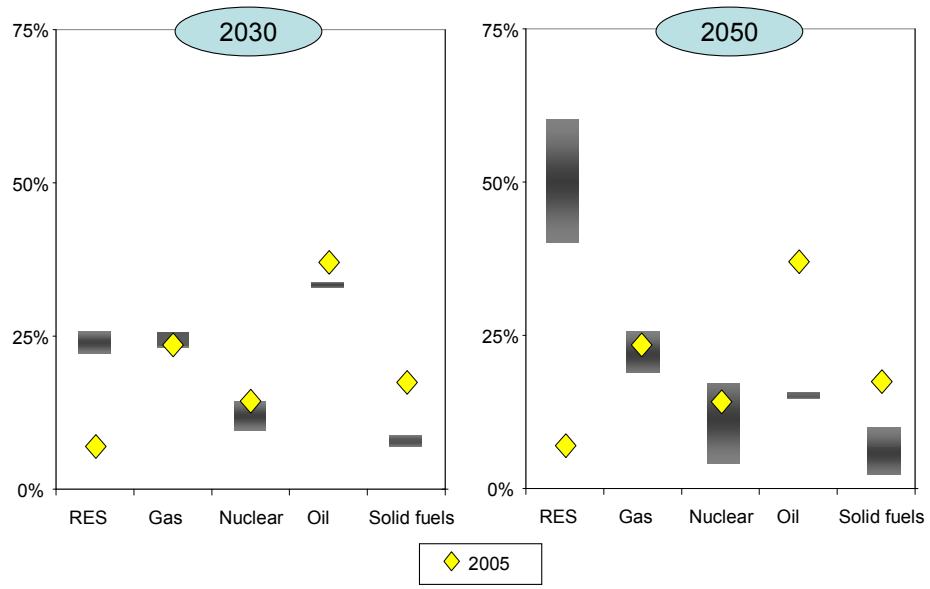
Roadmap Scenarios. A reference scenario (BaU as in March 2010), a Current Policies Initiatives (CPI) as a post-Fukoshima aware scenario, and 5 assessment scenarios: High Energy Efficiency, Diversified supply technologies, High Renewable energy sources (RES)., Delayed CCS, Low nuclear.

29 European Council, October 2009.

30 COM(2011)112, 8 March.

31 COM(2011)144, 28 March.

Graph 1: EU Decarbonisation scenarios - 2030 and 2050 range of fuel shares in primary energy consumption compared with 2005 outcome (in %)



Ten structural changes for energy system transformation

(1) Decarbonisation is possible – and can be less costly than current policies in the long-run

(2) Higher capital expenditure and lower fuel costs

(3) Electricity plays an increasing role

(4) Electricity prices rise until 2030 and then decline

(5) Household expenditure will increase

(6) Energy savings throughout the system are crucial

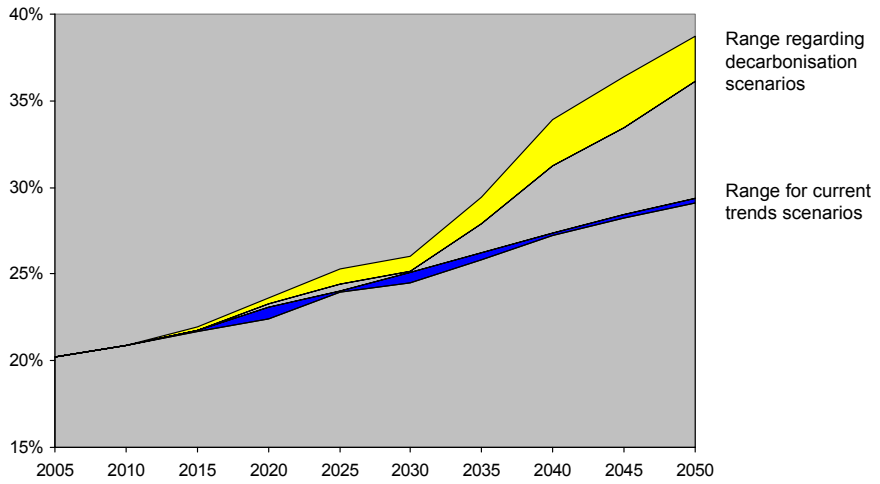
(7) Renewables rise substantially

(8) Carbon capture and storage has to play a pivotal role in system transformation

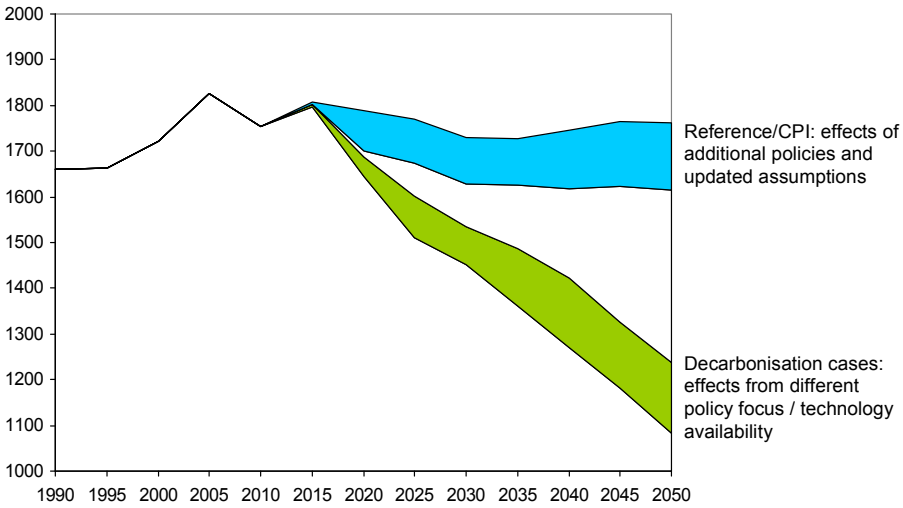
(9) Nuclear energy provides an important contribution

(10) Decentralisation and centralised systems increasingly interact

Graph 2: Share of electricity in current trend and decarbonisation scenarios (in % of final energy demand)



Graph 3: Gross energy consumption - range in current trend (REF/CPI) and decarbonisation scenarios (in Mtoe)



2011 Transport White Paper[32]

The key policy goals of the 2011 Transport White Paper are synthesized below.

- **Single European Transport Area**. Elimination of remaining barriers between different modes and different national transport systems (less unnecessary regulation and bureaucracy, and more technical compatibilities). Increasing the cohesion of transport network by establishing binding commitments of Member States towards implementation of TEN-T core network projects.
- **More diversified funding for transport**. Increased use of PPP schemes; better coordination of funding sources to meet Common Transport Policy objectives and targets: ERDF, Cohesion Fund, TEN-T budget, EIB loans; bond issuing initiatives to fund major infrastructures; "user-pays" principle.
- **Increased efficiency of investment**. Ex-ante project appraisal with cost benefit guidelines; competitive tendering, even when services of public interest may not operate under competition; clarification and uniform treatment of public funding; efficient corridor planning approach rather than project approach.
- **Environment welfare**. Internalisation of external costs of transport; EURO standards to seek further vehicle efficiency; visible links between the "polluter-pays" and "user-pays" principles and use of issued revenues.
- **Technology intensive**. More technology development more focussed on key thematic elements (alternative fuels, smart vehicles, efficient traffic and infrastructure management); European industry's leader in the global market.
- **Infrastructure priorities**. To address bottlenecks, cross-border links and network interconnections; to complete HSR network by 2050 to replace air transport below 1000km; to connect all airports to rail, preferentially to HSR, to promote air-rail intermodal travel. **Core Network**. Dual transport network composed of a high efficient multi-modal core network, and EU-wide cohesive network; increasingly segregated freight and passenger (enhanced flows and safer transport); increasingly balanced network between EU15 states and New Member States
- **Transport management**. Technology, pricing and scheduling to enhance infrastructure management and increase effective capacity (ATM, ERTMS, ICT…); *European Integrated Multimodal Information and Management Plan*, providing real-time network information all over Europe, efficient multi-modal planners and centralised ticketing.

The table below provides more details on the development of the above policy objectives.

Table 4-1 Synthesis of major concepts included in the 2011 Transport White Paper

Market regulation	Pricing & funding	Technology	Infrastructure	Management
Single European Transport Area eliminating all residual barriers between modes and national systems (technical and bureaucratic).	**Increasing difficulty in funding of transport infrastructure** -due to ageing society (social budgets), financial crisis, and alternative fuel vehicles reducing fuel taxation incomes.	**More focused R&D efforts required in Europe**. China's R&D spending grows at double digit rate (already 2nd largest R&D world power) and is focussed in most promising areas, while European research efforts remain diffused.	**Cost of EU missing infrastructure to match demand for transport** is estimated € 1.5 trillion for 2010-2030 (€215 billion for bottlenecks). Investment in vehicles and equipment required additional €1.0 trillion.	**Co-modality implies use of each mode where especially competitive**: - urban mobility → PT & electric vehicles (EV) - travel below 300km → conventional car - travel up to 1000km → high speed rail - long distance travel → aviation

[32] Transport White Paper (COM/2011/0144 final) and Commission Staff Working Document accompanying the White Paper (SEC/2011/0391 final).

Market regulation	Pricing & funding	Technology	Infrastructure	Management
Single European Railway Area - award of public service contracts under competition, - strengthening role of the European Rail Agency, - enhancing separation between IMs and operators	**"User pays" principle** Socioeconomic benefits and positive externalities may justify some level of public funding of transport but users are to pay for higher proportion implementation and operation costs.	**More efficient vehicles**, smaller and lighter. Vehicles in all transport modes need to become cleaner, safer and more silent.	**Balanced infrastructure endowment** between EU12 (New Member States) and EU15 countries.	**HSR in competition with aviation** and to provide alternatives to short haul- and feeding flights (+176 billion passenger kilometres for HSR by 2050 relative to 2005; +67 billion pax·km for air).
Single European Sky Modernised ATM infrastructure by 2020 (SESAR) and legislation changes to allow tripling airspace capacity, reduce 50% ATM costs, reduce 10% environmental impact.	**Road user charges to all vehicles on the whole network based on distance**, to reflect at least the marginal cost of infrastructure (wear and tear), congestion, air and noise pollution. Eurovignette extended to passenger transport	**Alternative fuels** - ROAD → urban EV, hydrogen & methane for mid distance), biofuels, LNG and LPG for long distance. - RAIL → electricity - AIR → biomass - WATER → biofuel, hydrogen (IWW), LPG and LNG (SSS), LNG & nuclear (deep sea)	**Dual TEN-T layer:** Multimodal TEN-T 'core network' by 2030 (selected corridors to carry large volumes of traffic with high efficiency and low emissions). EU-wide comprehensive network' underneath the core network .	**Attractive frequencies, reliability and intermodal integration** for enhanced quality service.
Binding commitments by MS to implementation of TEN-T core network projects (granting accomplishment of agreed time frames).	**Rail ticket fees set to stand for at least full operating costs of services** (2001 Directive on infrastructure charges).	**Galileo** (European Global Navigation Satellite System) to support existing ITS solutions once operational	**Core network constituted mostly of existing infrastructure.** Missing cross-border links and links connecting modes to be a priority under the Core Network.	**Infrastructure capacity to be adjusted to real traffic needs**. To make available high capacity links on the entire core network is not an objective.
Liberalisation of rail domestic passenger transport by 2012.	**European airports to be operated as businesses** in a competitive environment	**Ubiquitous communication in Road Transport** Infrastructure to vehicles to reach zero accident targets and tackle congestion	**Transport terminals conceived as multimodal connection platforms** - All core network airports linked to HSR by 2050, and efficiently connected to closest urban centres with PT	**Increasing separation between passenger and freight traffic** to optimise traffic flows (traffics with different needs) and increase safety
Rail infrastructure is a natural monopoly IMs under scrutiny to ensure that pricing and investment decisions are consistent with the goal of fostering railway	**Internalisation of externalities** The principle for charging should be that of marginal social cost pricing. Congestion pricing should be introduced to pay for local road externalities	**Advanced driver assistance systems** lane departure warning, anti collision, pedestrian recognition, eCall, in-vehicle speed limit regulator	**Corridor approach to infrastructure investment**, (e.g. Brenner Corridor Platform; ERTMS Rotterdam-Genoa freight corridor)	**Road management with ICT** to optimise transport and routes -10% reduction in fatalities per year (3,500 lives) -10% reduction in congestion costs (€ 12.3 billion)
Pan-European rail IMs In the long term to ensure co-ordinated development along key corridors, but allowing competition or benchmarking between different route managers. The EC will keep	**Noise-differentiated infrastructure access charges for rail** (proposed in 2010 by EC).	**Levitation rail**. Implanted in Shanghai airport, Japan plans to build Megalev between Tokyo and Osaka, EU has some trial tracks.	**Complete high-speed rail network by 2050**. Triple the length of existing HSR network by 2030 and maintain a dense rail network in all MS. By 2050 the majority of mid distance passenger transport will go by rail.	**More efficient rail management with ERTMS** (European Rail Traffic Management System). New signalling systems allow more trains to operate safely on a given section of track

Market regulation	Pricing & funding	Technology	Infrastructure	Management
EURO Standards Technological standards are effective to accelerate the introduction of cleaner vehicles by providing fixed targets for the industry.	**Airport charges** do not take into account the cost of congestion, or local externalities (noise, NOx)	**Unconventional technologies for aviation unlikely** before 2050, even if development of alternative fuels is accelerating	**Freight dedicated rail corridors**, with exclusive lines or preferential.	**More efficient Air Traffic Management (SESAR).** To reduce between 6% and 13% air trip lengths by 2020 (less air space fragmentation). Currently, Intra-EU routes are 15% less efficient than domestic.
Competitive tendering for public service contracts, and services of general interest. –competition for the market instead of competition in the market.	**Elimination of distortionary subsidies** to infrastructure financing and to service operation. Better modal choices will also have to be guided by prices that reflect all costs associated to transport	**Wind-based concepts** for waterborne transport, and LNG and Nuclear powered shipping	**Airport capacity between 2007 and 2030 will not be met** (between 11% and 25% of demand) despite a 40% capacity increase (Eurocontrol 2008).	**Better management of EU airports** - enhanced landing / take-off slot allocation - "One Stop Security**"** (no further control at transfer points if security control passed already at EU airport) - better ground-handling services
Ex-ante project appraisal. *Guide on Cost-Benefit Analysis in 2002 (updated in 2008)* to be used.	**Integrated funding framework for transport required** European Regional Development Fund (ERDF) and Cohesion Fund (13% of total) and loans from EIB (16% of total) to better focus CTP targets	**Interoperability of electronic technologies** - Electronic ticketing - Electronic tolling - Airport management systems (CUPPs).	**A corridor approach**. Transport corridors will need to be analysed within 2 years from the publication of the future EC *Corridor guidelines*, under the aegis of the European Coordinator and a multi-annual corridor development Plan	**River Information Services (RIS).** Establishment of an interoperable, intelligent traffic and transport system to optimise the existing capacity and safety of IWW and improve interoperability with other transport modes
Clear treatment of public funding to transport infrastructure and services.	**Diversification of funding sources** both public (EU, National and regional governments) and private (financial institutions and corporate). PPPs increasingly important.	**Electronic ticketing** on mobile devices (smart cards, cell phones…) can provide public transport operators and authorities with real time statistical data on users' behaviour.		**European Integrated Multimodal Information and Management Plan** (EIMIP). Real-time transport information throughout Europe and multimodal integrated ticketing all over EU.
	Europe 2020 Project Bond Initiative to provide support to companies issuing bonds to finance large-scale infrastructure projects. The EC would be risk-sharing with the EIB.			

Source: MCRIT for ORIGAMI FP7 (2012)

www.espon.eu

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.

ISBN-number: 978-2-919777-69-3