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Sustainable development in the European Union

2013 monitoring report of the EU sustainable development strategy

2013 edition

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Foreword

In 2012, the United Nations Conference on Sustainable Development ('Rio+20') renewed the global political commitment to taking a holistic approach to tackling modern world challenges. According to the provisions made at Rio, environmental protection should be integrated into economic growth strategies. Both should also be linked to decent living and working conditions and equitable access to resources. This is what we call sustainable development.

One of the most important outcomes of Rio+20 is the new aim of creating a framework for global goals and indicators — Sustainable Development Goals (SDGs) — which build on the current Millennium Development Goals. The world is currently debating the concrete agenda for the future SDGs. The European Union already has long-standing experience of this type of exercise, with the creation of its Sustainable Development Strategy (EU SDS) and the respective set of indicators.

The EU SDS brings together the many strands of economic, social and environmental policy under one overarching objective – to continually improve the quality of life and well-being for present and future generations. The Eurostat monitoring report, based on the EU set of sustainable development indicators and published every two years, provides an objective, statistical picture of progress towards the goals and objectives of the EU SDS. This 2013 edition more clearly than ever shows the disruptions caused by the economic crisis on employment, poverty, resource and energy use, greenhouse gas emissions and other important aspects related to sustainable development.

I hope that the fifth edition of this publication will be a valuable contribution on behalf of the European Union to the global debate on the future of sustainable development and the challenges lying ahead of us all — citizens, policy makers and statisticians.

Walter Radermacher
Director-General, Eurostat
Chief Statistician of the European Union

Acknowledgements

Editor-in-chief:

Mariana Popova (Eurostat, Unit C4 — Key indicators for European policies)

Editors:

Markus Hametner, Asya Dimitrova, Andreas Endl, Gerald Berger, Umberto Pisano (Institute for Managing Sustainability, WU Vienna), Juliane Fliedner, Bettina Rüegge, Andrea Schultheiss, Myriam Steinemann, Remo Zandonella (INFRAS), McKenna Davis, Christiane Gerstetter, Albrecht Gradmann, Martin Hirschnitz-Garbers, Timo Kaphengst, Katriona McGlade, Katharina Umpfenbach (Ecologic Institute)

Co-editors:

Viktoria Bolla, Ales Capek, Dorothea Jung, Lorenzo Menna, Vittorio Perduca, Iliyana Savova, Mario Giuseppe Varrenti, (Eurostat, Unit C4 — Key indicators for European policies), Carolyn Avery (ENDS, Haymarket Media Group Ltd)

Production:

Production co-ordinator: Carolyn Avery (ENDS, Haymarket Media Group Ltd)
Infographics: Leonard Dickinson, Carolyn Avery (ENDS, Haymarket Media Group Ltd), Mariana Popova (Eurostat, Unit C4 – Key indicators for European policies); **Illustrations**: Gary Wing;
Cover art direction: Kevin Hilton; **Logo design**: Sally Marshall; **Weather symbols**: Agtel

Expert advisors:

Martin Adams, Barbara Bacigalupi, Marisa Banasiak, Eusebio Bezzina, Paolo Bolsi, Jeanne De Canniere, Arturo de la Fuente Nuño, Hans-Martin Füssel, Sabine Gagel, Peter Gal, Christine Gertsberger, Lien Havard, Christian Heidorn, Rennie Herve, Ian Hodgson, Rolf-Jan Hoeve, Judita Horvathova, Annabelle Jansen, Catherine Kesy, Paulus Konijn, Fabienne Lefebvre, Bartek Lessaer, Luca Marmo, Paola Migliorini, Boryana Milusheva, Stephan Moll, Csaba Mózes, Andreas Nägele, Spyridoula Ntemiri, Alessandra Palmieri, Cinzia Pastorello, Reni Petkova, Roberta Pignatelli, Cristina Popescu, Teresa Rabade, Petronela Reinecke, Mathieu Remond, Elisabeth Rohner-Thielen, Anna Rybkowska, Eero Saue, Heidi Seybert, Stela Stamatova, Anton Steurer, Marek Šturc, Martin Teichgraber, Vincent Tronet, Stefaan Van der Jeught, Martin Vintera, Ulrich Wieland, Albrecht Wirthmann.

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http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

For more information please consult:

Eurostat
Bâtiment Joseph Bech
5, rue Alphonse Weicker
2721 Luxembourg
http://ec.europa.eu/eurostat
E-mail: estat-user-support@ec.europa.eu

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Executive summary

Executive summary

Of the more than 100 indicators presented in this report, 12 have been identified as headline indicators. They are intended to give an overall picture of whether the EU has achieved progress towards sustainable development in terms of the objectives and targets defined in the EU Sustainable Development Strategy (EU SDS). An evaluation of progress since 2000 based on these headline indicators shows a rather mixed picture, as shown in the table below.

Table 0.1: Evaluation of changes in the SDI headline indicators (EU-27, from 2000) (1)

SDI theme	Headline indicator	Evaluation of change in the EU-27
Socioeconomic development	Real GDP per capita	
Sustainable consumption and production	Resource productivity	
Social inclusion	People at risk of poverty or social exclusion (*)	
Demographic changes	Employment rate of older workers (2)	
Public health	Life expectancy at birth (**)	
Climate change and energy	Greenhouse gas emissions	
	Share of renewable energy in gross final energy consumption (**)	
	Primary energy consumption	
Sustainable transport	Energy consumption of transport relative to GDP	
Natural resources	Common bird index	
	Fish catches from stocks outside safe biological limits	
Global partnership	Official development assistance (**)	
Good governance	[No headline indicator]	:

(*) From 2008 (**) From 2004

The following pages provide a more detailed assessment of the key trends observed since 2000, complementing the analysis of the SDI headline indicators.

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.
(2) Due to a change in the methodology the evaluation of the indicator is not comparable with previous editions of the Monitoring Report. For details please see the 'demographic changes' chapter in this report.

Is the EU moving towards sustainable development?

Key trends in socioeconomic development

Real GDP per capita — signs of modest recovery?

- Between 2000 and 2012 **real GDP per capita** in the EU grew by 0.9 % per year on average. In the period from 1995 to 2007, before the onset of the economic crisis, GDP per capita had been growing continuously in the EU, at an annual average rate of 2.4 %.
- The financial and economic crisis took hold of the real economy in 2008, with GDP per capita contracting by 4.8 % in 2009 (compared to 2008). Swift implementation of fiscal stimuli and other policy actions at national and EU level contained the worst effects of the crisis and stabilised GDP per capita in 2010 and 2011.
- In 2012, against the background of a weak recovery, real GDP per capita fell again by 0.6 % compared to 2011.

The recession continues to weigh on the investment climate in the EU

- Between 2003 and 2007 **investment** (as a share of GDP) increased moderately, following the economic cycle. As household and corporate confidence tumbled during the financial market turmoil and economic crisis, investment started decreasing rapidly. The sharp fall in investment to a decade low of about 19 % between 2009 and 2011 was mainly driven by business sector cuts.
- Between 2000 and 2012 the **household saving rate** in the EU followed the economic cycle. While households reduced their savings during the economic upswing between 2003 and 2007, this trend was reversed by the economic upheaval and increased market uncertainty after the crisis. Despite signs of weak economic recovery, the household saving rate began to fall again after 2009.

Has the EU economy become more competitive and innovative?

- The steady increase in **labour productivity** between 2000 and 2007 was stalled by the slowdown in economic activity in 2008 and 2009. Although productivity picked up in 2010 and continued rising in the following years, long-term improvement will depend on future labour market adjustments. This could include changes in worker flows between states, sectors and regions or the response of wages to different labour market conditions.
- In the period 2000 to 2007 total **R&D expenditure** as a share of GDP remained relatively stable at 1.85 %. The indicator remained resilient to the short-term effects of the economic crisis. It even recorded a moderate increase in 2008 and 2009 before stabilising at 2 % over the following two years. This was mainly due to government efforts to support economic growth by boosting R&D expenditure.
- **Energy intensity** in the EU declined steadily between 2003 and 2009, followed by a rebound in 2010 and an accelerated decline in 2011. The positive trend occurred against the background of absolute decoupling of gross inland energy consumption from economic growth.

Muted labour market recovery

- The EU employment rate increased from 66.6 % in 2000 to 70.3 % in 2008. The rise ended in 2009 as the economic recession prolonged labour market stagnation and the employment rate remained around 68.5 % until 2012. This pushed the EU off-track to meeting the Europe 2020 target of 75 %.
- Between 2000 and 2007 **regional disparities in employment** in the EU were reduced by 2.1 percentage points. Progress was erased by the economic crisis, which gradually brought regional inequalities in employment back to the 2000 level (13.3 % in 2012). On the positive side, the gender gap in regional employment was reduced to a decade low of 5.6 percentage points.
- Overall, in the period between 2001 and 2004 the **total unemployment rate** in the EU increased. In the following four years (2005 to 2008) the unemployment rate fell continuously, reaching a low of 7.1 % in 2008. These improvements were followed by a sharp increase, and in 2012 the EU's unemployment rate reached a record high of 10.5 %.

Key trends in sustainable consumption and production

Absolute decoupling of material use from economic growth?

- In 2011 the EU was able to generate an economic value of EUR 1.60 for each kilogram of material consumed. This was a considerable improvement in **resource productivity** since 2000, when only EUR 1.34 per kg had been created from the same amount of resources.
- This efficiency gain occurred because GDP was growing faster than **domestic material consumption** (DMC), particularly before the economic crisis hit. Since 2007, EU resource use has dropped sharply, putting DMC below levels seen even ten years ago. However, economic recovery indicates a trend reversal in 2011.
- These divergent trends — GDP growing while DMC falls — imply an absolute decoupling of economic growth from resource use in the EU between 2000 and 2011. However, it is unclear whether this is an actual turnaround in resource use patterns or merely a reflection of the impact of the economic crisis on resource-intensive industries such as construction.

Improvements in waste treatment and pollutant emissions

- **Waste treatment** practices have improved considerably in the EU since 2000. Landfilling, the least environment-friendly method of disposal, has been gradually replaced by incineration and, to a greater extent, by recycling and composting. In 2011, about 40 % of municipal waste was recycled or composted.
- There is huge variation in waste treatment across the EU. In 2011, landfilling was the main way of disposing of waste in Bulgaria, Croatia and Romania (more than 90 %), whereas its share was below 1 % in Germany, the Netherlands and Sweden.
- Similar improvements have occurred with **atmospheric emissions** of acidifying substances and ozone precursors. Steady declines since 1990 have allowed the EU-27 to meet its emission targets for sulphur oxides (SO_X) and non-methane volatile organic compounds (NMVOC) by 2011. However, 12 Member States reported emissions above their national ceilings for at least one of the four pollutants.

No clear trend towards more sustainable consumption patterns

- **Electricity consumption of households** has risen almost continuously since 1990. This trend has been driven mainly by a rise in the number of households and changes in their consumption patterns, outstripping efficiency improvements of electronic devices. This phenomenon is known as the 'rebound effect'. In contrast to other consumption indicators in this report, household electricity consumption proved rather unresponsive to the economic crisis, with 2011 being the first year to show a sharp drop in electricity use since 1990.
- Similarly, **final energy consumption** in the EU has been on the rise since 1990. However, 2005 marked a turning point, with energy use stabilising and then falling in the years after. The contractions in the EU economy in 2009 and 2011 contributed to the drop, pushing final energy consumption in 2011 down to pre-2000 levels.
- Because household electricity consumption and final energy consumption have shown different trends, particularly since 2005, it is not possible to conclude whether consumption patterns in the EU have become more sustainable.

More environment-friendly production patterns

- Production patterns, by contrast, have improved in the EU over the past years. The number of organisations implementing a certified environmental management system according to the **Eco-Management and Audit Scheme (EMAS)** has grown since 2003. In 2013, EMAS uptake — expressed in number of EMAS-registered organisations per million inhabitants — was particularly high in Cyprus, Austria, Spain, Italy, Germany and Denmark.
- Similarly, farming practices have become more and more sustainable in the EU since 2005, as illustrated by the increase in the share of **organic farming**. This dynamic development has also been reflected in growing sales of organic products in the EU food market.

Key trends in social inclusion

The number of people at risk of poverty or social exclusion has risen since 2008

- Between 2008 and 2012 the number of **people at risk of poverty or social exclusion** grew by 8.7 million, from 115.7 million to 124.4 million. This number had been falling between 2005 and 2009. With the onset of the economic crisis, however, it started to rise again.
- The 124.4 million people at risk of poverty and social exclusion in the EU in 2012 translate into a 25 % share of the total population. This means that one fourth of the EU population experienced at least one form of poverty covered by the theme's headline indicator, namely monetary poverty, severe material deprivation and lack of access to jobs. The current levels of poverty and social exclusion jeopardise the Europe 2020 strategy's target for poverty alleviation, which aims to lift at least 20 million people out of the risk of poverty and social exclusion by 2020.

Monetary poverty increasing and living conditions deteriorating

- The number of people **at risk of poverty after social transfers** increased from 80.7 million in 2008 to 85.3 million in 2012. In contrast to the headline indicator, this number has seen an almost continuous increase since 2005, even before the economic crisis, with an acceleration after 2009. Monetary poverty is the most prevalent form of poverty in the EU, affecting 17.1 % of the total EU population in 2012.
- The number of people affected by **severe material deprivation** rose considerably from 2008 to 2012, from 41.4 million to 51.0 million. However, the trend was not continuous, with 2009 marking a significant turning point. While the number of people in severe material deprivation fell considerably by almost 12 million between 2005 and 2009, it has since grown again by 11.2 million, resulting in 10.3 % of the EU population being affected in 2012.
- Between 2005 and 2012 **income inequality** barely changed. In 2012, the richest 20 % of the population in the EU earned more than 38 % of the national equivalised income and thus about five times more than the poorest 20 %, who only accounted for a share of slightly less than 8 %.

No clear trend towards more sustainable labour market

- The number of people living in households with **very low work intensity** increased between 2008 and 2012, from 34.3 million to 36.9 million. In line with other poverty-related indicators this number fell between 2006 and 2009, but then increased again in parallel with rising unemployment levels, before dropping by 4.1 % between 2011 and 2012. Economic inactivity substantially increases the risk of being poor. In 2012, 9.8 % of the EU population aged 0 to 59 lived in households with very low work intensity.
- The EU's **long-term unemployment rate** showed a falling trend between 2004 and 2008. Since 2008, however, the rate has increased again, reaching a historical high of 4.6 % in 2012.
- Between 2006 and 2011 the **gender pay gap** substantially reduced. Despite this favourable trend, hourly gross earnings of women were still 16.2 % lower than those of men in 2011.

Improvements in education

- The share of **early leavers from education and training** has fallen steadily since 2003, reaching 12.8 % in 2012. If recent trends can be sustained, the target to reduce early school leaving rates to less than 10 % by 2020 seems to be in reach.
- The share of the population aged 30 to 34 with **tertiary educational attainment** has been continuously increasing since 2000. The trend suggests that the Europe 2020 target of increasing this share to at least 40 % by 2020 will be reached.
- The share of **adults with low educational attainment** has fallen substantially since 2000. The trend is visible across all age groups.
- Participation in **lifelong learning** increased between 2003 and 2012; however, most of this increase occurred between 2003 and 2005, while participation in lifelong learning has not seen further progress since then. The Nordic countries achieve the highest participation rates, whereas Bulgaria, Greece and Romania have recorded little or no progress in improving their low levels of involvement.

Key trends in demographic changes

Employment rate of older workers unaffected by the economic crisis

- 48.9 % of **older workers** were in employment in 2012. The **employment rate** has slightly and continuously increased since 2000. The increase in labour force participation of older workers is a stable trend, which seems to be resistant to the economic crisis. Nevertheless, the 50 % target set in the Lisbon strategy – the predecessor of Europe 2020 – to be met in 2010 has still not been achieved.
- A narrowing of the gap in employment of older workers between men and women is visible over the period 2000 to 2012. While the employment rate for women remained lower than that of men, the increase was clearly higher for women, at 14.4 percentage points since 2000, compared with 9.3 percentage points for men.

Trends of population structure confirm demographic challenges

- **Life expectancy at age 65** in the EU was at a level of 21.3 years for women and 17.2 years for men in 2011. Since 2002 the expected years to live have increased continuously for both sexes and the gap between men and women has declined. As the rate of increase per year in 2011 was below 1 % for women, it is unclear whether it will still increase in the future.
- In 2011 the EU **fertility rate** was 1.57 children per woman. This indicates an increase of 8 % since 2002. Nevertheless, after a period of stabilisation at 1.6 children, the average number of children born slightly decreased in 2011.
- In addition to the recent decrease in the fertility rate, the **net rate of migration** in the EU decreased in 2011. These two downward trends might lead to an acceleration of demographic change, with an increasing share of older people in European countries.
- The **ratio of elderly people to the population of working age** in the EU has steadily increased to a level of 25.8 % in 2012. Recent projections predict a continuous increase in the future until 2050, followed by stabilisation at a level of about 55 %.

No major improvements in the income levels of pensioners

- In 2012 the average **income level of pensioners** in EU was 56 % of the earnings of the working population in their 50s. After remaining more or less stable at about 50 %, the replacement ratio has experienced a moderate upward trend since 2010.
- Across EU Member States the ratio of income levels from pensions of elderly people relative to the income level from earnings of those aged 50 to 59 ranged from 39 % in Cyprus to 79 % in Luxembourg. Between 2005 and 2012 the spread between the Member States increased slightly.

Still no recovery of public finances in EU

- **Public debt** in the EU has considerably increased since the onset of the economic crisis in 2007. After falling below the Maastricht reference level of 60 % in 2007 (to 59 %), it climbed substantially during the following years, reaching 85.3% of GDP in 2012. Across the EU the levels of public debt varied significantly, ranging from 10.1 % of GDP in Estonia to 156.9 % in Greece.
- One factor of public spending is the costs for pension payments by the state. Many Member States reformed pension systems to extend the population's **duration of working life**. Between 2000 and 2011 the average duration of working life in EU increased by 1.8 years. In 2011 men worked on average 37.4 years and women 31.9 years during the course of their life.

Key trends in public health

Improvements in life-expectancy not leading to longer life in good health

- Between 2004 and 2011 **life expectancy at birth** for both women and men increased moderately with an annual growth rate of 0.4 % (men) and 0.3 % (women). In contrast the number of **healthy life years at birth** did not improve for women and only slightly for men.
- Higher growth rates in life expectancy and lower growth rates in healthy life years imply that people on average do not spend their years in good health but with some kind of disability or disease.

Improvements in health indicators slowing since the onset of the economic crisis, and health inequalities persist

- Between 2000 and 2009 the **death rate due to chronic diseases** fell from 142 to 116 per 100 000 people aged less than 65 in the EU. Men, who are currently more likely to die of a chronic disease, experienced a higher decrease (2.4 %) than women (1.9 %), suggesting a gender-convergence of the death rates. In spite of the improvements in death rates due to chronic disease, the ratio of deaths due to chronic disease on all death remained constant. This indicates that the decrease in the death rates from chronic disease could mainly be explained by the overall decrease in death rates.
- The **suicide death rate** recorded an overall average decrease of 1.4 % between 2000 and 2010. However, the trend has not been continuous. Between 2000 and 2007 the average yearly decrease was much higher at 2.5 %. However, suicides increased substantially during 2008 (by 2 %) and 2009 (by another 3 %), but fell again in 2010. Most of the increase in suicide death rates since 2007 has been experienced by men, potentially reflecting the impact of the economic crisis on unemployment.
- Economic constraints limit **access to health care**. After declining between 2005 and 2009 the share of the population that felt unable to afford medical care started to grow again in 2009, reaching 2.3 % in 2011. The alignment of this change in trend with the economic crisis and persisting income inequalities in access to health care shows that economic constraints reduced access to medical care.

No or insufficient improvements in health determinants such as toxic chemical production and exposure to air pollution

- **Production of toxic chemicals** in the EU increased slightly between 2002 and 2007, but fell considerably in 2008 and 2009 due to the economic crisis. Two years later (in 2011), after the European market recovered, production settled back to the old high level. The temporary drop can hence be explained by the stagnating economy leading to lower industrial production during the economic crisis.
- Between 2000 and 2011 urban **exposure to air pollution by particulate matter** decreased by 1 microgram per cubic metre, reaching a level of 27 micrograms per cubic metre in 2011. However, given the substantial year-on-year variations it is difficult to discern any clear trend. The 2010 target to reduce emissions to 20 micrograms could not be achieved. In 2010 the emission of particulate matter constituted 26 micrograms per cubic metre, which was 6 micrograms above the target.
- Overall urban **exposure to air pollution by ozone** rose at an annual average rate of 1.7 % between 2000 and 2011. However, the development was volatile due to the influence of weather on ozone concentrations and wide variation between countries.

Key trends in climate change and energy

Reductions in EU greenhouse gas emissions, but rising global temperature

- EU **greenhouse gas emissions** have fallen substantially since 1990. The strongest drops occurred in the early 1990s and between 2007 and 2011. The Europe 2020 target of cutting greenhouse gas emissions by 20 % compared with 1990 levels by 2020 is clearly within reach.
- The biggest reductions were achieved in the manufacturing, construction and energy industries. The waste and agriculture sectors have also reduced emissions, but they make up a smaller share of the total. The only sector with growing emissions is the transport sector. Emissions from international aviation and maritime transport have risen particularly fast. Emissions from inland transport also remain above 1990 levels, but have shown a downward trend since 2007.
- Reductions in EU greenhouse gas emissions are overcompensated by quickly rising global emissions. Concentrations of greenhouse gases in the atmosphere are rising. Even though there is a time lag between emissions and temperature increase, **global mean temperature** records already show a clear upward trend. Warming has continuously sped up over the past four decades.

No clear trend towards lower energy demand

- After having risen more or less continuously between 1990 and 2006, **primary energy consumption** in the EU fell to 1990 levels in 2011. Yet, the downward trend was not continuous. It remains to be seen if the decline can be maintained once the EU economy returns to higher economic growth.
- The EU **imported more than half of its energy** in 2011. Since the early 1990s the share of total energy needs provided by imports from non-EU countries has increased almost every year. From 2006 onwards it has remained at slightly more than 50 %.

Rapid expansion of renewable energies, particularly in the electricity sector

- Energy generated from biomass, wind, solar and the earth's heat is helping to provide an ever increasing share of final energy demand in the EU. All Member States have increased their **renewable energy share** between 2005 and 2011. While the contribution of biomass is by far the largest, wind and solar energy have expanded fastest.
- Penetration of renewable energies is highest in the electricity sector, where renewables covered a fifth of gross power generation in 2011.
- By contrast, the share of renewables used in **transport** went down in 2011 compared to the previous year. However, this is due to statistical adjustments that exclude biofuels that have not been certified as sustainable. Yet 2010 data show that the EU has missed its interim target for increasing the use of renewable energies in transport.

Key trends in sustainable transport

No absolute decoupling of energy consumption of transport from economic growth

- **Energy consumption of transport per unit of GDP** has fallen by 8.3 % since 2000. This trend has been somewhat stronger since the start of the economic crisis, as the environmental component of this indicator — transport energy use — fell for four consecutive years after 2007. Overall, between 2000 and 2011 transport energy use increased by 6.7 %, while economic growth was faster, with 16.5 %.
- These coinciding trends — growth in both energy consumption and (even stronger) in GDP — imply relative decoupling of energy consumption of transport from economic growth in the EU over the period 2000 to 2011. Absolute decoupling (that is a reduction in transport energy consumption while the economy is growing) could be observed on a year-over-year basis both in 2010 and 2011. It is, however, uncertain whether this is an ongoing trend or merely a consequence of the economic crisis.

No substantial change of transport modes and mobility

- Transport performance of different transport modes do not vary greatly. The **modal split of passenger transport** in 2011 remained very similar to its 2000 levels. **Freight transport** has shown slight shifts since 2009, with rail regaining its lost share from road transport. Therefore, modal shares of freight transport are also nearing their 2000 levels. However, these slight changes may also be due to methodological reasons.
- Even though the modal split does not show large changes at the EU-level, the shares of each transport modes vary greatly between Member States. While road transport dominated both passenger and freight transport in 2011, rail had substantial shares of more than 30 % of freight transport in some Member States, such as the Baltic countries.
- No substantial decoupling effect is observed for freight volumes relative to GDP. The crisis had a deep impact on both GDP and transport volumes, the latter being affected more heavily. Since 2009, numbers have shown a timid recovery. Whether this represents a decoupling cannot yet be concluded.

Negative transport impacts yet to be reduced

- There has still not been an overall decrease of **greenhouse gas emissions from transport** since 2000. Although emissions have been falling since 2007 as a result of the economic downturn, this decline has not offset the increases in emissions seen before.
- **Road fatalities** have continued to fall since 2000. However, the goal of only 27 000 victims due to road accidents in 2010 was reached. Therefore, further efforts need to be implemented to attain the 2020 goal of fewer than 15 500 fatalities.

Key trends in natural resources

Is the EU losing its natural capital?

- Between 2000 and 2011 the **index of common birds** remained relatively stable, but more polarised trends are evident in the populations of common farmland and forest birds. While forest birds have increased by 9.7 percentage points over this period, the farmland bird index dropped by 5.6 percentage points.
- Changes in agricultural methods, intensification and specialisation are largely responsible for farmland bird declines in Northern and Western Europe. Major drivers are the provision of harmful subsidies, a lack of incentives for maintaining high nature value farmland (agricultural areas supporting high species and habitat diversity and/or species of conservation concern) and the increasing use of biomass for the production of renewable energy.
- Total **fish catches taken from stocks outside safe biological limits** declined by 23.1 percentage points from 2000 to 2010. However, annual values from 2002 to 2010 fluctuate around an average of 16.3 %, which is well above the safe biological limits. Thus total fish stocks remain threatened by overfishing in the North East Atlantic.

A declining fishing fleet: good for the environment and the coastal economy

- The size of the **EU fishing fleet** (measured in terms of engine power) decreased by 2.4 % on average per year from 2007 to 2012. But more efforts and policy reforms are needed for a sound fleet capacity adjustment, which would lead to more sustainable fish stock management and better economic conditions for active fishermen.

Water abstraction close to sustainable levels

- Total **water abstraction decreased over the past decade** in most regions of Europe with the exception of West Southern Europe, where it has been constant. Countries such as Lithuania, Romania and Belgium made significant progress towards more sustainable water management.

Urbanisation and transport drive further land take in the EU

- 4.6 % of the EU's land area was covered by artificial areas in 2012. Rising demands for housing and economic activities in urban areas and the increasing expansion of network areas in coastal zones are mainly responsible for a continuous shrinkage of semi-natural and arable land in the EU.

Key trends in global partnership

Official development assistance in decline, EU missing its targets

- Between 2004 and 2012 the EU's total **official development assistance (ODA)** expressed as a share of gross national income (GNI) increased by 0.05 percentage points, reaching 0.39 % in 2012 ([3]).
- However, over the period from 2010 to 2012 total ODA from the EU declined due to budget constraints resulting from the economic and financial crisis. A similar trend can be observed for other major donors.
- The EU already missed its collective interim target of dedicating 0.56 % of its GNI to ODA in 2010. If the increase continues at the same pace as between 2004 and 2012, the EU will not reach its long-standing collective target of dedicating 0.7 % of its GNI to official development assistance in 2015.

Increase in share of EU financing for development for developing countries

- **Financing for developing countries** from the EU-15 Member States, including both public and private flows, grew by an average of 4.6 % per year between 2000 and 2011. Despite this positive overall trend, fluctuations can be observed which may create unpredictability for developing countries that are particularly reliant on external financial support.
- Since 2000, the **share of ODA to least developed countries and other low income countries** has increased, with 52.5 % of official development assistance from the EU-15 going to these countries in 2011.
- **Foreign direct investment (FDI)** is a vital complement to development efforts. However, from 2000 to 2011, EU-15 FDI to least developed countries and other low-income countries decreased by 3.4 % per year on average, from 3.2 % of total FDI in 2000 to 2.2 % in 2011.

Increase in EU imports from developing countries

- **Imports from developing countries** into the EU increased by an average annual rate of 7.8 % between 2000 and 2012; the share of developing country imports in overall EU imports increased from 35.2 % in 2001 to 47.2 % in 2012.
- Imports from China were the single largest factor behind this trend. Their share in total EU imports from developing countries increased from 24 % in 2000 to 35 % in 2012. In absolute terms, the volume of imports from China in 2012 was more than three times the 2000 amount.
- **Imports from least-developed countries** also increased, but on average the growth rate was only about a third the growth rate of imports from all developing countries to the EU. In 2012 imports from least-developed countries still represented less than 2 % of overall EU imports.

Gap in CO_2 emissions closing due to increases in developing countries

- Although the gap in **per capita CO_2 emissions** narrowed between the EU and developing countries in the decade 2000 to 2011, the EU's emissions remain at 7.4 tonnes per capita; 2.6 times higher than the developing country average of 2.9 tonnes per capita.
- The gap narrowed primarily due to increasing emissions from developing countries and the financial crisis which led to lower per capita CO_2 emissions in the EU.

([3]) Provisional data for 2012

Key trends in good governance

Positive trends in policy coherence and effectiveness, but less trust from the public

- Less than half of EU citizens have **trust in the three main EU institutions**. In 2012, the European Parliament was the most trusted among them (44 % of citizens say they trust it), followed by the European Commission (40 %) and the Council of the EU (36 %). Citizens' trust in political institutions on all political levels is generally low, especially regarding political parties and institutions at the national level (for example only 15 % trust political parties and 27 % trust national governments).
- Between 2007 and 2012 the number of new **Single Market related infringement cases** fell by 38 %. Most of this decline occurred since 2010. Taxation and environmental issues make up the two largest groups of Single Market related infringement cases by policy sector, representing 44 % of all pending infringement cases in November 2012.
- After dropping significantly since 2000, the **transposition deficit of EU Single Market law** reached a new low of 0.6 % in November 2012. Promoted by the Internal Market Scoreboard as the 'best result ever', the transposition deficit was 0.4 percentage points below the 1 % target for the transposition of Single Market rules.

Citizen's online interaction with governments on the rise, but less participation in elections

- **Citizens' online interaction with public authorities** in the EU rose by 8 percentage points between 2008 and 2012. After a slight decrease in 2011, internet interactions with public authorities have increased again, reaching 44 % in 2012. This trend partly reflects an overall increase in internet usage across the EU.
- **Voter turnout** has seen a 1.5 percentage point reduction in national parliamentary elections in the EU between 2000 and 2012. A decreasing trend is also visible in participation in EU parliamentary elections.

No shift in taxation from labour to energy and environmental taxes achieved

- The **ratio of labour to environmental taxes** in the EU increased by 10.1 % from 2000 to 2011. Over this period, the share of environmental taxes in total revenues from taxes and social contributions declined compared with labour taxes. This trend runs counter to the goals of the EU Sustainable Development Strategy and the Europe 2020 strategy, both of which call for taxation to shift from labour to energy and environmental taxes ('greening' the taxation system).
- Similarly, the **implicit tax rate on energy** also dropped in the EU. However, this was less substantial dropping by just 1.6 % from 2000 to 2011. The fall in the implicit tax rate on energy indicates a decline in the effective tax burden on energy relative to the potentially taxable base.

Impacts of the global economic and financial crisis on the key trends

The indicators presented in this report show a rather mixed picture. In addition, the disruptions caused by the economic crisis make it hard to draw comprehensive conclusions about whether the EU has moved along the path towards sustainable development.

As a consequence of the global economic and financial crisis that began in late 2007, the EU went into recession during 2008. In late 2013, as this report was being finalised, the EU economy was still only growing slowly. The impact of the crisis has been severe and goes far beyond the economy, affecting many of the social and environmental trends analysed in this publication. This section provides a brief summary of the areas affected over a period starting in 2007 and extending where possible to 2011/2012. Although it is not clear at this point, some of the consequences, such as lower levels of investment, could have long-term and persistent knock-on effects which will only become apparent in later reports.

Liquidity problems in the banking sector, which began in 2007, led to a squeeze on credit and falling asset prices, feeding into lower consumer demand and an increase in 'household saving', a decrease in 'investment' from businesses and households, a fall in international trade (reflected in the indicator 'imports

from developing countries') and a decline in 'real GDP per capita'. Levels of 'public debt' rose drastically. 'Employment' fell, particularly among the young, and men were hit harder than women ('female employment'). The trend of increasing 'employment rate of older workers' slowed. Due to labour hoarding and changes to working hours 'labour productivity' fell.

'Research and development expenditure' on the other hand increased, as several countries boosted their expenditure to try to support economic recovery and longer term growth. In response to falling demand, industrial production also fell. This is evident in the example of the 'production of toxic chemicals'.

The rise in 'unemployment' and 'long-term unemployment' has had social impacts. Although the overall 'risk of poverty' decreased, it grew for the 25 to 49 year age group and also slightly for 18 to 24 year olds. The 'intensity of poverty' also increased, as did 'suicides', especially among men and the middle-aged. The 'crude rate of net migration' also fell, probably as a reaction to the difficulty in finding employment in the EU. In terms of combating global poverty, 'financing for developing countries' fell, due to reduced flows from private donors, rather than from official sources or NGOs.

Energy demand ('final energy consumption') fell in parallel to GDP. This lower consumption led to a stabilisation of the EU's 'energy dependence', breaking the long-term trend towards increased dependency. 'Greenhouse gas emissions' and pollutant 'atmospheric emissions', which were already decreasing, fell even more quickly.

Freight transport fell faster than GDP (reflected in the indicator 'volume of freight transport relative to GDP'). Nevertheless, energy consumption of transport fell less than GDP ('energy consumption of transport relative to GDP'), probably due to a slower decrease in passenger transport. 'Greenhouse gas emissions from transport' fell, and 'emissions of nitrogen oxides (NO_X) from transport' and 'emissions of particulate matter from transport' decreased faster than in previous years. The 'number of people killed in road accidents' also fell, probably as a result of lower traffic volumes.

The public reaction to the crisis and how it has been handled is reflected in the fall in 'citizen's confidence in EU institutions' and in 'voter turnout in national elections'.

Overall, the circumstances outlined above make it hard to assess whether real progress towards sustainable development has been made in the EU over the past few years. However, keeping in mind that almost half of the headline indicators of the EU SDI set are moving in a moderately or clearly unfavourable direction, more efforts seem to be needed to put the European Union on the path to sustainable development.

Introduction

Introduction

Sustainable development is a fundamental and overarching objective of the European Union, enshrined in the Treaty ([1]). Measuring progress towards sustainable development is an integral part of the EU Sustainable Development Strategy (EU SDS), and it is Eurostat's task to produce a monitoring report every two years based on the EU set of sustainable development indicators (EU SDIs). This 2013 edition of the monitoring report is the fifth quantitative assessment of whether the EU is moving towards its sustainable development objectives ([2]).

The EU set of Sustainable Development Indicators (SDIs)

Background

Eurostat took its first steps towards measuring sustainable development (SD) in the 1990s. Following the United Nations (UN) Conference on Environment and Development held in Rio de Janeiro in 1992 (also known as 'Rio Earth Summit'), Eurostat worked closely with the UN work programme on global indicators of sustainable development, and published indicator compilations in 1997 ([3]) and again in 2001 ([4]).

A first EU-oriented set of SDIs was proposed following the adoption of the first EU SDS in 2001 ([5]) and was endorsed by the European Commission in 2005 ([6]). The set was slightly revised after the review of the EU SDS from 2001 ([7]) that led to the adoption of a renewed strategy in 2006 ([8]). Since then several reviews of the SDI set have been carried out by the Commission with the assistance of the working group on SDIs, which is composed of both statistical and policy representatives at national and EU level. Nevertheless, the current set of SDIs, as presented in this report, is very similar to that endorsed in 2005.

The thematic framework

The set of EU SDIs is organised within a theme-oriented framework, to provide a clear and easily communicable structure and relevance to political decision-making. The framework is based on priority policy issues, but is flexible enough to adjust to possible changes in these priorities and objectives, bearing in mind that new issues and priorities emerge from time to time.

The ten themes of the SDI framework follow a gradient from the economic, through the social and environmental to the global and institutional dimensions:

- Socioeconomic development
- Sustainable consumption and production
- Social inclusion
- Demographic changes
- Public health
- Climate change and energy
- Sustainable transport
- Natural resources
- Global partnership
- Good governance.

([1]) Article 2 of the Treaty on European Union.
([2]) For previous assessments based on the EU SDIs see http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/publications.
([3]) Eurostat, *Indicators of sustainable development: A pilot study following the methodology of the United Nations Commission on Sustainable Development*, Luxembourg, Office for Official Publications of the European Union, 1997.
([4]) Eurostat, *Measuring progress towards a more sustainable Europe: Proposed indicators for sustainable development*, Luxembourg, Office for Official Publications of the European Union, 2001.
([5]) Göteborg European Council, Presidency conclusions, 15 and 16 June 2001.
([6]) Communication from Mr Almunia, *Sustainable development indicators to monitor the implementation of the EU Sustainable Development Strategy*, SEC(2005) 161.
([7]) Commission Communication, *On the review of the Sustainable Development Strategy — A platform for action*, COM(2005) 658.
([8]) Council of the European Union, *Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy*, 10917/06.

Each theme is further divided into subthemes and includes three levels of indicators (see the following section on the different kinds of indicators included in the set).

The main body of the renewed EU SDS from 2006 is built around seven key challenges, with corresponding operational objectives and targets as well as associated actions and measures. In addition, a number of key objectives and policy guiding principles serve as a basis for the strategy. Each of the seven key challenges of the renewed EU SDS was already represented by a theme in the original framework from 2005 ([9]). The SDI framework additionally includes a theme on 'socioeconomic development' which focuses on the key objective of economic prosperity, and a theme on 'good governance' related to the guiding principles of the EU SDS and other cross-cutting issues. Both of these themes have been retained from the original version of the framework from 2005.

The most recent changes to the indicator set were related to the adoption of the Europe 2020 strategy ([10]) and its eight headline indicators, which have been integrated into the SDI framework in the themes 'socioeconomic development', 'social inclusion' and 'climate change and energy'.

Thus over the course of several revisions, some changes have been made to reflect trends in EU policies related to sustainable development, although the overall framework has proved sufficiently robust to remain unaltered.

The different kinds of indicators

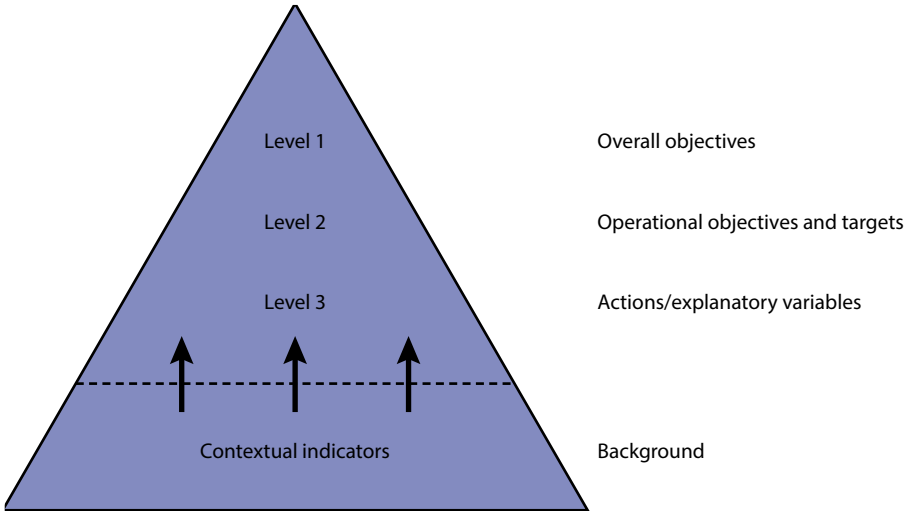
The set of EU SDIs is structured as a three-storey pyramid, distinguishing between three levels of indicators. This approach not only reflects the structure of the EU SDS (overall objectives, operational objectives, actions), but also responds to different kinds of user needs. The three-level pyramid is complemented with contextual indicators, as illustrated below:

- **Headline** (or level 1) indicators are at the top of the pyramid, monitoring the 'overall objectives' related to the seven key challenges of the EU SDS. On the whole they are widely used indicators with a high communicative and educational value. They are robust and available for most EU Member States, generally for a period of at least five years.
- The **second level** of the pyramid consists in most cases of indicators related to the 'operational objectives' of the Strategy. They are the lead indicators in their respective sub-themes. They are robust and available for most EU Member States for a period of at least three years.
- The **third level** consists of indicators related to actions described in the strategy or to other issues which are useful for analysing progress towards its objectives. Breakdowns of higher level indicators, for example by gender or income group, are usually also found at level 3.
- **Contextual indicators** are part of the SDI set, but either do not monitor directly a particular SDS objective, or they are not policy responsive. Generally, they are difficult to interpret in a normative way. They are included because they provide valuable background information on issues that have direct relevance to sustainable development policies and are helpful to gaining an understanding of the topic.

([9]) The topics 'social inclusion, demography and migration' are considered together in one EU SDS key challenge, but are represented by two separate themes ('social inclusion' and 'demographic changes') in the SDI framework. This division has been retained even after the adoption of the renewed EU SDS in 2006 in order to reflect the different nature of these two issues.

([10]) European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final.

Figure 0.1: The SDI pyramid



The 2013 monitoring report mainly analyses level 1 and level 2 indicators thus focusing on the most important issues related to SD. The current set of indicators is available on the Eurostat website at http://ec.europa.eu/eurostat/sustainabledevelopment.

Data coverage

Data are mainly presented for the aggregated EU-27 level, referring to the situation of the 27 EU Member States before the accession of Croatia to the EU in July 2013. This is because EU-28 aggregated data were not available for many of the indicators at the time of writing this publication. In a few cases (in particular for indicators in the 'global partnership' theme) data are shown for the EU-15 aggregate level, referring to the 'old' EU Member States before the EU enlargement of 2004.

Croatia is nevertheless included in the country-wise comparisons throughout the report that complement the EU-level analysis whenever the differences in performance between Member States are of interest. In addition to the 28 EU Member States, data for EU candidate countries and the countries of the European Free Trade Association (EFTA) are included when available.

Additionally, global comparisons of the EU with other major economies in the world (such as the United States, Japan and China) or sub-national comparisons of the EU regions (at NUTS ([11]) 2 level) are included, mainly for the SDI headline indicators and the Europe 2020 indicators.

Most of the data used to compile the indicators stem from the standard Eurostat collection of statistics through the European Statistical System (ESS), but other data sources have also been drawn on, notably other European Commission services, the European Environment Agency (EEA), the Organisation for Economic Co-operation and Development (OECD) and the World Bank.

Most of the data presented were extracted in early October 2013. Data stemming from the EU Statistics on Income and Living Conditions (EU-SILC) were extracted at the end of October 2013 because the most recent data (from 2012) only available became at that time.

([11]) The NUTS (Nomenclature of Territorial Units for Statistics) classification is a hierarchical system for dividing up the economic territory of the EU. For further details see http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction.

Evaluation of indicators

What is evaluated?

This publication's main purpose is to assess progress towards sustainable development based on the objectives and targets set out in the EU SDS and other relevant policy initiatives such as the Europe 2020 strategy. The object of the evaluation is the relative direction and rate of change in light of sustainable development objectives, not the 'sustainability' ([12]) of the situation at any point in time. It is therefore a relative, not an absolute assessment.

Ideally, each indicator would be evaluated against either a quantitative target set within the political process or a scientifically established threshold. However, many of the EU SDS's objectives lack an explicit quantified and measurable target. In these cases, the indicator is evaluated according to a set of common and objective rules to ensure a consistent approach across indicators and to avoid ad hoc value judgments. These rules, although imperfect, provide a simple, transparent, consistent and easily understandable approach across the report.

How is an indicator evaluated?

The report evaluates progress by means of four categories depending on how favourable or unfavourable the developments have been over recent years. The four categories are represented visually by means of weather symbols, as shown in Table 0.2.

It is the purpose of this publication to assess the progress of the EU as a whole since the adoption of the first EU SDS ([13]). The evaluation of each indicator is therefore based, as far as possible, on the evolution of the indicator between 2000 and the latest year of data available for the EU-27 ([14]). The calculation involves two separate steps:

Calculating the pace of the development of an indicator

The 'compound annual growth rate' is calculated to assess the pace of an indicator's evolution. This method uses the data from the first (usually the year 2000) and the last year of the available time series and calculates the annual rate of change of the indicator (in %) between these two data points. A change of more than 1 % per year is considered clearly favourable or unfavourable (depending on the direction of the change in relation to SD objectives). This refers to the sun and the thunderstorm symbols in Table 0.2 below. A change between 0 % and 1 % is considered moderately favourable or unfavourable.

Calculating the consistency of the trend

Because the calculation of the 'compound annual growth rate' only takes into account the data from the first and the last year of the time series, it is necessary to complement this result with a measure related to the trend's consistency over the whole time series. This refers to whether the observed trend was continuous over time (a constant increase or decrease), or whether it was more volatile (experiencing ups and downs, making it difficult to assess the direction of change). This is particularly relevant for indicators that have seen strong 'disturbances' caused by the economic crisis, such as GDP growth, energy consumption or risk of poverty.

Calculating the consistency of an indicator trend is based on 'Spearman's rank order correlation coefficient' (Spearman's ρ), whereby a significance level of 0.1 is used to distinguish between continuous (below 0.1) or more volatile (above 0.1) trends. Based on this result, two different kinds of weather symbols are shown for each category (see Table 0.2).

([12]) The concept of sustainable development should be distinguished from that of sustainability. 'Sustainability' is a property of a system, whereby it is maintained in a particular state through time. The concept of sustainable development refers to a process involving change or development. The strategy aims to 'achieve continuous improvement of quality of life', and the focus is therefore on sustaining the process of improving human well-being. Rather than seeking a stable equilibrium, sustainable development is a dynamic concept, recognising that change is inherent to human societies.

([13]) Although it could be argued that longer time periods are needed to monitor sustainable development, it is the purpose of this publication to assess progress since commitments were taken on the various issues monitored. The year 2000 was chosen as reference year because it is the last round year before the adoption of the EU SDS in 2001.

([14]) EU aggregates are back-calculated when sufficient information is available. For example, the EU-27 aggregate is often presented for periods prior to the accession of Bulgaria and Romania in 2007 and the accession of ten new Member States in 2004, as if all 27 Member States had always been members of the EU. The label is changed if the data refer to another aggregate (EU-25 or EU-15) or a note is added if the data refer to a partial aggregate created from an incomplete set of country information (no data for certain Member States or reference years).

Table 0.2: Categories and associated weather symbols for the evaluation of the indicators

Evaluation category	Symbol (continuous trend)	Symbol (non-continuous trend)
Changes are **clearly favourable** in relation to SD objectives		
No or **moderately favourable** changes in relation to SD objectives		
Changes are **moderately unfavourable** in relation to SD objectives		
Changes are **clearly unfavourable** in relation to SD objectives		
Contextual indicator or not enough data available for an evaluation	:	

How the absence or presence of quantified targets influences the evaluation

In the absence of a quantified target, the evaluation of an indicator is entirely based on the calculation of the observed rate of change and the consistency of the trend, using the thresholds previously described.

In the presence of a quantified political target (such as for greenhouse gas emissions or employment), the actual rate of change of the indicator (based on the 'constant average growth rate' as described above) is compared with the theoretical rate of change that would be required to meet the target in the target year. If the actual rate is 95 % or more of the required rate, the indicator is evaluated as clearly favourable ('on target path'). Between 80 % and 95 % is evaluated as moderately favourable ('close to target path'), and between 0 % and 80 % is evaluated as moderately unfavourable ('far from the target path'). The evaluation is clearly unfavourable if the actual trend is pointing in the wrong direction, away from the target path.

Decoupling indicators as a special case

For some of the indicators the issue of interest is not the change in one single number but in the relationship of two trends. One of these two trends is usually an economic variable (such as GDP growth), and the other an environmental variable that shows the environmental pressures exerted by the economic activity. For example, this is the case when analysing trends in resource productivity, where the focus is put on the relationship between the trends in GDP growth and material use.

These indicators are called 'decoupling' indicators because they show the strength of the link (or the 'coupling') between the economic and the environmental variable. In relation to sustainable development objectives, the aim is to achieve a 'decoupling' of these two variables so that continued economic growth does not lead to a further increase in environmental degradation.

'Decoupling' indicators are evaluated by comparing trends in the two underlying variables (that is the type of 'decoupling' that has occurred). 'Absolute decoupling' occurs when the pressure on the environment decreases while the (economic) driving force increases and is evaluated as being 'clearly favourable'.

When pressure on the environment decreases but at a slower pace than the decrease in the economic variable, this situation is referred to as 'relative decoupling' and is evaluated as 'moderately favourable' ([15]). A situation where the an environmental pressure is increasing but at a slower rate than the increase in the driving force is also called 'relative decoupling', but is evaluated as 'moderately unfavourable' because of the increase in the environmental impacts.

When the pressure on the environment increases at the same or a higher rate than the growth of the economic variable, no decoupling has taken place and is evaluated as 'clearly unfavourable'.

([15]) It has to be noted that this situation describes a rather theoretical case, as a decline in the economic driving force (GDP growth) has so far only been observed for individual years but not for the whole time series that is used for the evaluation. For the sake of completeness this case has nevertheless been added to the set of rules used for evaluating the indicators in this 2013 edition of the Monitoring Report.

What's new?

Given the recent developments at European and international level, the monitoring report 2013 features some new elements compared with previous editions.

One of the new features of this edition is looking at interlinkages at various levels. This includes the interlinkages between the concept of sustainable development and new, emerging concepts such as 'green growth', 'green economy', and 'quality of life'. Although these concepts are intrinsically linked to sustainable development, they are usually discussed in different arenas. The following chapter analyses the concepts of 'green economy' and 'quality of life' and their links to sustainable development from a conceptual point of view. In addition, at the beginning of each thematic chapter in this report selected 'green economy' and/or 'quality of life' indicators are analysed. These 'green economy' and 'quality of life' pages show indicators that are at the nexus between sustainable development and these two related concepts ([16]). The aim is to show how 'green economy' can be seen as a means for implementing the concept of sustainable development, and how 'quality of life' can be perceived as its ultimate outcome.

Important interlinkages also exist between different geographical levels, that is, between countries and their regions, between the EU and its Member States, and between the global level and the EU. To this end, global comparisons of the EU with other major economies in the world or sub-national comparisons of the EU regions are included for some SDI headline indicators and Europe 2020 indicators.

Additionally, inequalities between different sub-groups of the population are increasingly recognised as an important aspect not only for sustainable development but also for official statistics. The outcome document of the 2012 UN Conference on Sustainable Development — 'The Future we want' — emphasises that 'sustainable development must be inclusive and people-centered, benefiting and involving all people, including youth and children', recognising that 'gender equality and women's empowerment are important for sustainable development and our common future' ([17]). Whenever data are available, inequalities between the sexes, between age groups or between EU citizens and people with a migration background or from ethnic minorities are therefore highlighted throughout this report, for example in 'women's corners'.

An important novelty is the change in the evaluation methodology. The method for evaluating trends in the indicators — based on the 'compound annual growth rate' and visualised through weather symbols — was complemented with the Spearman's rank order correlation coefficient test. The aim was to indicate whether trends have seen a continuous (structural) development over time, or whether they have rather been based on volatile developments that make it difficult to determine the direction in which the indicator is evolving.

Finally, if you should be wondering why a whole beehive is flying around in this report: bees can be seen as a good example of sustainable societies, contributing not only to the well-being of the hive but also providing important ecosystem services for the good of humanity (by pollinating plants and by producing honey). We have therefore made excessive use of the new 'bee-logo' of the EU SDI set to remind us about the bigger role that we are playing in the Earth's ecosystem and about the importance of the progress that needs to be made towards sustainable development in the EU and worldwide.

([16]) The indicators highlighted on the 'green economy' pages are proxies of the green economy indicator set currently developed by UNEP. The indicators presented on the 'quality of life' pages were chosen according to their relatedness to the social inclusion concept, whereby priority was given to indicators from Eurostat's quality of life indicator set. In case of lacking data similar indicators from the European Quality of Life Survey (EQLS) were taken on board.

([17]) UN GA, *The future we want*, A/RES/66/288, 2012 (para 31).

The broader horizon of sustainable development

Sustainable development, green economy and quality of life — how does it all fit together?

The purpose of this chapter is to look into the relationship between sustainable development (SD) and emerging concepts such as green economy, green growth or quality of life, both at the European and the international level. The Rio+20 conference held in 2012 in Rio de Janeiro and its outcomes are used as a starting point for this exercise. At the European level, the Europe 2020 strategy has taken over parts of the sustainable development agenda and is thus worth a closer look, which is done in the second part of this chapter.

The roots of sustainable development in the international policy agenda

In 1987 the World Commission on Environment and Development (WCED) published its very influential report 'Our common future' ([1]), also known as 'Brundtland report' ([2]). Drawing on the spirit of the United Nations Conference on the Human Environment held in Stockholm in 1972, which had introduced environmental concerns into the formal political development sphere, the Brundtland report placed environmental issues firmly on the political agenda, with the aim to discuss environment and development as a single issue. The report focused particularly on the problems of global poverty and the resource limits and natural laws for human societies. In more detail, it put forward eight interrelated objectives for sustainable development.

Box 0.1: Objectives for sustainable development in 'Our common future'

The WCED report 'Our common future' outlined the following critical objectives for environment and development policies that follow from the concept of sustainable development ([3]):

- Reviving growth
- Changing the quality of growth
- Meeting essential needs for jobs, food, energy, water, and sanitation
- Ensuring a sustainable level of population
- Conserving and enhancing the resource base
- Reorienting technology and managing risk
- Merging environment and economics in decision making
- Reorienting international economic relations.

The United Nations Conference on Environment and Development in 1992 in Rio de Janeiro marked a major milestone for the vision for the direction and nature of the modern sustainable development (SD) policies. It enabled a consensus between the two conflicting disparities of economic and human development and environmental protection by introducing the concept of SD into the policy agenda (an analysis based on the EU SDI set reveals that some of these disparities still persist; see Annex III). More important, from a statistical point of view, the conference sparked the development of new systems of measurements to better reflect the concept of sustainable development and prosperity. Commonly used indicators such as the gross national product (GNP) or individual resource or pollutant flows were already perceived as not being able to capture the more complex and interacting nature of the concept of sustainable development ([4]). This was the starting point for a series of initiatives including nowadays 'GDP and beyond' activities, stressing the importance for new measurement systems for SD.

Why Rio again? The road up to 'Rio+20'

Sustainable development has faced serious challenges since the UN Conference on Environment and Development reinvigorated the concept in Rio de Janeiro in 1992. Putting the idea into practice has proved difficult and its outcomes remain uneven across countries. Thus, unsustainable trends persist: on the one hand growing world population and rising consumption puts a strain on the life-supporting environment we rely

([1]) World Commission on Environment and Development, *Our common future*, 1987.
([2]) Named after the former Norwegian prime minister Gro Harlem Brundtland who acted as chair of the WCED.
([3]) World Commission on Environment and Development, *Our Common Future — Chapter 2: Towards Sustainable Development*, A/42/427, 1987 (para. 28).
([4]) UN, 1992. Agenda 21. para. 40.4.

on ([5]). On the other hand, the impressive progress on GDP growth has not stopped the income gap between rich and poor expanding. A large share of the global population still lives in severe poverty with no access to basic needs such as a secure food supply, sanitation or electricity ([6]).

Thus 20 years after the first Rio conference, the United Nations Conference on Sustainable Development ((UNCSD) held in June 2012 again in Rio de Janeiro — therefore also called 'Rio+20' ([7]) — was conceived to set a landmark and increase momentum to turn around environmental deterioration and the hardship experienced by society's poorest and most vulnerable.

Rio+20 and 'The future we want'

The Rio+20 conference was hosted by Brazil in Rio de Janeiro from 20 to 22 June 2012. It was attended by participants from 192 UN member states, including several heads of state and government and representatives from private sector companies, NGOs and other groups. The conference focused on two themes: (1) a green economy in the context of sustainable development poverty eradication; and (2) the institutional framework for sustainable development. In the run-up to the conference seven areas were identified as needing priority attention: decent jobs, energy, sustainable cities, food security and sustainable agriculture, water, oceans and disaster readiness.

With the aim of strengthening commitment on these challenges, Rio+20 produced a comprehensive outcome document, entitled 'The future we want' ([8]). Although the document covered a substantial number of topics from the environment and human development agenda, it also received criticism, mainly with regard to a lack of new commitments. As such, critics argued that the text revealed a strong preference for process and political declarations rather than concrete implementation. However, it was acknowledged that 'The future we want' does offer plenty of opportunity to engage in future initiatives ([9]).

One of the most significant decisions for the sustainable development agenda was the agreement to develop 'Sustainable Development Goals'.

Box 0.2: Main outcomes of the Rio+20 conference in 'The future we want'

The Rio+20 outcome document 'The future we want' contains a number of practical measures for implementing sustainable development ([10]):

- Member States decided to launch a process to develop a set of Sustainable Development Goals (SDGs), to build on the Millennium Development Goals and converge with the post 2015 development agenda.
- Governments also decided to establish an intergovernmental process under the General Assembly to prepare options on a strategy for sustainable development financing.
- Governments also agreed to strengthen the United Nations Environment Programme (UNEP) on several fronts.
- They also agreed to establish a high-level political forum for sustainable development.
- Governments also requested the United Nations Statistical Commission, in consultation with relevant United Nations system entities and other relevant organisations, to launch a programme of work in the area of measures of progress to complement gross domestic product to better inform policy decisions.
- Governments also adopted the 10-year framework of programmes on sustainable consumption and production patterns, and invited the General Assembly to designate a Member State body to take any necessary steps to fully operationalise the framework.

([5]) The Future We Want — Zero draft of the Rio+20 outcome document (para 11); see http://www.uncsd2012.org/futurewewant.html.
([6]) OECD, *Divided We Stand: Why Inequality Keeps Rising*, 2011.
([7]) See http://www.uncsd2012.org.
([8]) UN GA, *The future we want*, A/RES/66/288, 2012.
([9]) Based on: *'Rio+20: Half full or half empty?'* (access 10.9.2013)
([10]) See http://sustainabledevelopment.un.org/rio20.html.

Sustainable Development Goals — a global framework for measuring progress

Because assessing progress and identifying gaps in implementing sustainable development is a main objective, a new framework for goals and indicators is central to the Rio+20 outcome document. The Montreal Protocol on Substances that Deplete the Ozone Layer ([11]) and the Millennium Development Goals (MDG) ([12]) are two best practice examples of successful international initiatives for which numerical targets were set.

In this context, 'The future we want' calls for global Sustainable Development Goals (SDGs) to be elaborated by 2015 'for focused and coherent action on sustainable development' ([13]). The UN recommends governments agree on the development of key universal SDGs, covering all three dimensions of sustainable development and their interconnections.

Work towards the SDGs is coordinated by an Open Working Group (OWG) of the UN General Assembly established in January 2013. During a first consultation, UN member states identified the following preliminary, globally relevant priority areas for SDGs:

- Poverty eradication
- Sustainable management of the resource base
- Sustainable consumption and production
- Access to basic goods and services for a decent life
- Productive employment
- Health and education.

Box 0.3: How is the EU following up on Rio+20?

Based on a public consultation held in summer 2012 and the conclusions of the European Environment Council meeting in October 2012, the European Commission in 2013 formulated a common approach to follow up on Rio+20 in its communication 'A decent life for all' ([14]). Therein the EU outlined the need for actions towards an 'inclusive green economy' and developing an overarching framework to address these issues post 2015 through, for example, Sustainable Development Goals (SDGs).

With regard to implementation, the Rio+20 outcome document notes the importance of 'develop[ing] and utilis[ing] sustainable development strategies as key instruments for guiding decision-making and implementation of sustainable development' ([15]). In October 2012, the European Environment Council consequently highlighted that the 'European Sustainable Development Strategy (EU SDS) […] should be reviewed as soon as possible, at the latest in 2014,' to implement all the commitments in 'The future we want' at EU and Member States level ([16]).

Additionally, the 'A decent life for all' communication highlighted the role of the Europe 2020 strategy, which 'builds on the integrative approach initiated by the EU Sustainable Development Strategy, by contributing to greater coherence, mainstreaming and integration of the three dimensions of sustainable development in EU policies at large'. The Europe 2020 flagship initiative 'A resource-efficient Europe' ([17]) and the corresponding roadmap ([18]) can in this regard be seen as a first step towards the transition to a green economy.

([11]) UNEP Ozone secretariat united Nations Environment Programme, 2000. The Montreal Protocol for Substances that Deplete the Ozone Layer.
([12]) UN Resolution adopted by the General Assembly, 2000. United Nations Millennium Declaration.
([13]) UN GA, *The future we want*, A/RES/66/288, 2012, para. 246
([14]) European Commission, *A decent life for all: Ending poverty and giving the world a sustainable future*, COM(2013) 92 final (p. 6).
([15]) UN GA, *The future we want*, 2012. A/RES/66/288, para. 98.
([16]) European Council, *Conclusions on Rio+20: Outcome and follow-up to the UNCSD 2012 Summit*, 15477/12, Brussels, 25 October 2012 (para. 3).
([17]) European Commission, 2011. *A resource-efficient Europe — Flagship initiative under the Europe 2020 Strategy*. COM(2011) 21
([18]) European Commission, 2011. *Roadmap to a Resource Efficient Europe*. COM(2011) 571 final

Figure 0.1: Word cloud based on different definitions of 'green economy'

Source: Authors' analysis loosely based on UNDESA, *A guidebook to the Green Economy. Issue 1: Green Economy, Green Growth, and Low-Carbon Development — history, definitions and a guide to recent publications*, 2012.

What is a green economy?

At Rio+20 the environmental pillar of SD received special attention, mainly through the concept of green economy. This referred to the importance of managing natural resources sustainably and with lower negative environmental impacts ([19]).

'Green economy' and 'green growth' — different ways of greening the economy

The term 'green economy' was first mentioned in a report for the Government of the United Kingdom in 1989, entitled 'Blueprint for a Green Economy' (Pearce, Markandya and Barbier, 1989). According to UNEP, a green economy is defined as 'one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities' ([20]).

The OECD and the World Bank use a slightly different terminology, talking about 'green growth'. According to the OECD, 'green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies' ([21]). The World Bank has taken the concept of green growth further, talking about inclusive green growth: 'Critically, we cannot presume that green growth is inherently inclusive, but […] green growth can, and in our view must, be designed in a way that makes it inclusive. While we have good reason to think that improved environmental performance will benefit the poorest and most vulnerable, green growth policies must be carefully designed to maximize benefits and minimize costs for them' ([22]).

The concepts of green economy and green growth have recently acquired a lot of attention. Both concepts try to alleviate the impacts of the recent economic crisis by attempting to 'restart economic growth' and, therefore, tackle rising unemployment. They also try to create economic opportunities in response to environmental problems such as climate change and increasingly scarce natural resources through energy- and resource-saving technological innovation. While the concepts imply a strong focus on the integration of the environment and the economy, most definitions provided by international organisations such as UNEP

([19]) UN GA, *The future we want*, A/RES/66/288, 2012, para 60, 61.
([20]) UNEP, *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication,* Nairobi: UNEP, 2011 (p. 16).
([21]) OECD, *Towards Green Growth*, 2011.
([22]) World Bank, *Inclusive Green Growth: The Pathway to Sustainable Development*, 2012.

or the World Bank incorporate a social dimension, thus referring to 'inclusive green economy' or 'inclusive green growth'. Figure 0.1 shows in an easy-to-gasp way which terms are most prominently used in the various definitions of 'green economy' as put forward by UNEP and other organisations.

Differences and similarities between green economy and green growth concepts

Looking at the practical implementation of the green economy and green growth concepts, a comparison of the OECD, UNEP and World Bank's 'green' indicators ([23]) reveals that while some indicators are common to all three organisations' concepts, these indicators are located in different themes or topics. This means that the same indicators are used by the organisations for measuring different issues. Most similarities occur in the lists of OECD and UNEP, while there are only three indicators (share of renewable energy, employment and access to water) mentioned on the World Bank's list that are comparable to the ones proposed by the other two organisations. Some 30 % (12 out of 39) of the indicators proposed by UNEP match those of the OECD, mainly environmental indicators such as CO_2, water and energy productivity as well as the share of renewable energy. Vice versa, some 25 % of the OECD indicators match those from UNEP (12 out of 50).

In general, OECD indicators focus on economic and productivity issues related to 'green growth' (resource productivity, material productivity and economic opportunities and policy responses). In comparison, UNEP puts more emphasis on concrete attributes suited to the environment such as resource efficiency, climate change, green fiscal reform and access to resources and health disturbances coupled to environmental harms.

How does greening the economy deliver sustainable development?

Due to the wide variety of views on the green economy and the challenge of creating a common definition, UNEP and Rio+20 established a common understanding that a green economy is a means to sustainable development (see Figure 0.2). Essentially, the concept postulates that the transformation of the economy is a precondition for sustainable development ([24]). Thus, investment in and a shift towards more green goods and services (for example, preventing, limiting or correcting environmental damage to air, water, soil) might consequently reduce environmental impacts on the natural environment and the human population now and for future generations. Likewise, increased attention and investment in human and social capital (for example, offering social protection or higher quality education) might lessen social inequality, poverty and social exclusion.

Despite the concept's inclusion of social objectives, concerns have been raised about how effectively it can achieve them. The green economy might not be able to prevent the current misallocation of capital to address prevailing social inequalities or the vulnerabilities created by short-term speculation on the financial markets. More specifically, long-term social objectives and quality of life, which are at the core of sustainable development, might continue to be undermined. Therefore, a dual focus on the green economy emphasising economic-environment interconnections while taking into account a sustainable development perspective is necessary to keep in mind the bigger picture of quality of life and well-being.

Quality of life — from the means to the ends

A key issue highlighted in the Rio+20 outcome document 'The future we want' is the explicit inclusion of social aspects in many thematic areas. Social inclusion and tackling inequalities as well as poverty eradication and improved quality of life are key elements, in particular for the concept of a green economy. In this regard, the Rio+20 outcome document 'recognise[s] that people are at the centre of sustainable development and, in this regard, we strive for a world that is just, equitable and inclusive' ([25]).

([23]) The comparison is based on the lists of UNEP, OECD and World Bank indicators outlined the report 'Moving Towards a Common Approach on Green Growth Indicators' published by the Green Growth Knowledge Platform. The lists of the indicators are also included in the Annex to this publication.
([24]) UNEP (2011), *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. Nairobi: UNEP; and UN GA (2012). The future we want. A/RES/66/288, para. 56-74.
([25]) UN GA, *The future we want*, A/RES/66/288, 2012, para 6; see also paras 2, 21, 23 and 58.

Quality of life as the ultimate ends of sustainable development

Although enhancing quality of life (QoL) has long been a major explicit or implicit life-style and policy goal for individuals, communities, nations and the world, a common definition for this concept has not emerged so far. According to Constanza et al., 'Quality of Life (QoL) is the extent to which objective human needs are fulfilled in relation to personal or group perceptions of subjective well-being' ([26]).

Figure 0.2: Relationship between 'sustainable development', 'green economy' and 'quality of life'

Besides its linkage with SD through the green economy concept, QoL as a multidimensional concept addresses other important aspects of sustainable development in direct and indirect ways. The EU Sustainable Development Strategy emphasises that by linking economic development, protection of the environment and social justice, sustainable development 'aims at the continuous improvement of the quality of life and well-being on Earth for present and future generations' ([27]). In this sense QoL — representing various dimensions such as educational attainment, health status, a safe human environment, or adequate monetary and income conditions — targets the fulfilment of basic human needs as being one aspect of sustainable development and, more specifically, its ultimate goal (see Figure 0.2).

Yet, sustainable development goes beyond the concept of quality of life, focusing on general QoL of individuals and societies in the present, by (i) extending the concept of needs also to future generations and (ii) taking into account the limits imposed by the natural environment. As such, sustainable development has been defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' ([28]).

Furthermore, sustainable development captures a more holistic view of the state and development of society and the environment. Basically, sustainable development also engages in the wider framework enabling QoL: socioeconomic development contributing to an innovative and eco-friendly economy with high employment, ensuring a democratic system promoting fundamental rights and social equality, or the dynamics of the natural environment and population and the influence they exert on each other.

Quality of life and well-being are concepts often used interchangeably. Well-being is also sometimes perceived as one component of the broader concept of QoL ([29]). More specifically, the term well-being refers to objective conditions and subjective experiences within the context of quality of life ([30]). A concrete example can be found in the Stiglitz-Sen-Fitoussi report characterising subjective well-being as part of people's quality of life ([31]).

([26]) Costanza, R. et. al., *An Integrative Approach to Quality of Life Measurement, Research, and Policy*, S.A.P.I.EN.S. 1 (1), 2008.
([27]) Council of the European Union, *Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy*, 10917/06, (para 1).
([28]) World Commission on Environment and Development, *Our Common Future*,1987.
([29]) Scottish Executive Social Research, *Well-being and quality of life: measuring the benefits of culture and sport: a literature review and thinkpiece*, 2005 (para 4.13); Haas, B. K., *Clarification and Integration of Similar Quality of Life Concepts*, IMAGE: Journal of Nursing Scholarship, 1999, Vol. 31, No. 3 (p. 4, 8).
([30]) Ryan, R. M. & Deci, E. L., *On happiness and human potentials: A review of research on hedonic and eudaimonic well-being*. Annual Review of Psychology, 52, 2001 (141-166).
([31]) UNECE/Eurostat/OECD (2013). *Framework and suggested indicators to measure sustainable development*. prepared by the Joint UNECE/Eurostat/OECD Task Force on Measuring Sustainable Development p. 43.

Eurostat quality of life and additional measurement frameworks

Within the European Statistical System, a so-called 'Sponsorship Group' on the topic 'Measuring progress, well-being and sustainable development' was established to work towards a set of QoL indicators (see Box 0.4).

Box 0.4: Sponsorship Group 'Measuring progress, well-being and sustainable development'

To live up to the challenge of measuring quality of life posed by the European Commission's 'GDP and beyond' communication ([32]) and the so-called Stiglitz-Sen-Fitoussi (SSF) report 'Measurement of Economic Performance and Social Progress' ([33]), Eurostat established the Sponsorship Group 'Measuring, Progress, Well-being and Sustainable Development'. The group was dedicated to enhancing the experience and knowledge of measuring those phenomena and to developing specific and concrete indicators that answer the challenges described in the 'GDP and beyond' communication and the SSF report. To do so, the sponsorship group set up three tasks forces dealing with the following topics:

- Household perspective and distributional aspects of income, consumption and wealth
- Multidimensional measures of quality of life
- Environmental sustainability.

As one of the main outcomes of the work on 'multidimensional measures of quality of life', a set of quality of life indicators has been disseminated by Eurostat since early 2013 ([34]). Overall, the Sponsorship Group took into account a comprehensive and multidimensional perspective on quality of life. Thus, contrary to the idea of developing a single synthetic indicator summarising all aspects of quality of life, the developed set focuses on several dimensions covering both objective and subjective aspects: (1) material living conditions, (2) productive or main activity, (3) health, (4) education, (5) leisure and social interactions, (6) economic and physical safety, (7) governance and basic rights, (8) natural and living environment, and (9) overall experience of life. Box 0.5 lists other activities occurring at the European or international level in relation to QoL.

Box 0.5: Other initiatives on measuring Quality of Life

At the European level, Eurofund (the European Foundation for the Improvement of Living and Working Conditions) produces the European Quality of Life Survey (EQLS). The EQLS explore issues pertinent to the lives of European citizens, such as employment, income, education, housing, family, health, work–life balance, life satisfaction and perceived quality of society on a subjective as well as objective level.

Within the OECD 'Better Life Initiative: Measuring Well-Being and Progress', the compendium of OECD well-being indicators covers a comprehensive picture of well-being in OECD countries and other major economies. The indicators cover the areas of income, jobs, housing, health, work-life balance, education, social connections, civic engagement and governance, environment, personal security and subjective well-being.

Furthermore, the compendium presents a preliminary, synthetic version of some of the indicators considered in its publication 'How's Life?' ([35]), which extends the picture by looking at inequalities in well-being across the population.

([32]) European Commission, 2009, *GDP and beyond: Measuring progress in a changing world*. COM(2009) 433 final.
([33]) Stiglitz, J., Sen, A., Fitoussi, J. P., 2008, Report by the Commission on the Measurement of Economic Performance and Social Progress.
([34]) See the dedicated section on the Eurostat website at http://epp.eurostat.ec.europa.eu/portal/page/portal/quality_life/introduction.
([35]) OECD, *How's life? Measuring well-being*, 2011.

The Europe 2020 strategy — how does it fit in the picture?

The Europe 2020 strategy ([36]), adopted by the European Council on 17 June 2010 ([37]), is the EU's new ten-year strategy for growth and jobs. It puts forward three mutually reinforcing priorities to make Europe a smarter, more sustainable and more inclusive place to live:

- It envisions the transition to **smart growth** through the development of an economy based on knowledge, research and innovation.
- The **sustainable growth** objective relates to the promotion of more resource-efficient, greener and competitive markets.
- The **inclusive growth** priority encompasses policies aimed at fostering job creation and poverty reduction.

Under the three priority areas, the EU adopted five headline targets on employment, research and development (R&D) and innovation, climate change and energy, education, and poverty and social exclusion. The strategy objectives and targets are further supported by seven thematic flagship initiatives.

Figure 0.3: The Europe 2020 strategy's key priorities, headline targets and flagship initiatives

	Targets	Flagship initiatives
Smart Growth	— 3 % of GDP to be invested in the research and development (R&D) sector. — Reduce the rates of early school leaving to below 10 %, and at least 40 % of 30 to 34 year olds to have completed tertiary or equivalent education.	— Innovation Union — Youth on the move — A digital agenda for Europe
Sustainable Growth	— Reduce greenhouse gas emissions by 20 % compared to 1990 levels. — Increase the share of renewables in final energy consumption to 20 %. — 20 % increase in energy efficiency.	— Resource efficient Europe — An industrial policy for the globalisation era
Inclusive Growth	— 75 % of 20 to 64 year old men and women to be employed. — Reduce poverty by lifting at least 20 million people out of the risk of poverty and social exclusion.	— An agenda for new skills and jobs — European platform against poverty and social exclusion

Europe 2020 and the EU SDS as a synergetic and complementary system

The EU Sustainable Development Strategy (EU SDS) describes its relationship to the Lisbon Strategy — the predecessor of Europe 2020 — as complementary. The EU SDS, by providing the long-term perspective and clear and coherent guidance to all policy areas, sets the overall framework, within which short- and medium-term strategies should operate. Whereas the EU SDS is primarily concerned with quality of life, intra- and inter-generational equity and coherence between all policy areas, including international aspects, it recognises the role of economic development in facilitating the transition to a more sustainable society.

The measures of Europe 2020, for instance, should therefore be compatible with the long-term sustainable development goals of the EU SDS. In this sense, Europe 2020 can be seen as the practical implementation of the EU's overarching policy agenda for sustainable development. In its recent 'A decent life for all' communication, the European Commission highlighted the role of the Europe 2020 as building 'on the integrative approach initiated by the EU Strategy for Sustainable Development, by contributing to greater coherence, mainstreaming and integration of the three dimensions of sustainable development in EU policies at large' ([38]).

([36]) European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010.
([37]) European Council Conclusions, 17 June 2010.
([38]) European Commission, *A decent life for all: Ending poverty and giving the world a sustainable future*, COM(2013) 92 final (p. 6).

Europe 2020 has thus drawn on several of the challenges addressed in the EU SDS. These include resource efficiency, the '20/20/20' climate and energy targets, as well as poverty reduction and education. Table 0.2 shows a comparison of the seven EU SDS key challenges and how they have been taken up by the Europe 2020 strategy's flagship initiatives.

Table 0.2: How the seven EU SDS key challenges are addressed by the Europe 2020 strategy and its flagship initiatives

Europe 2020 flagship initiative EU SDS key challenge	A digital agenda for Europe	Innovation Union	Youth on the Move	A Resource-Efficient Europe	An Integrated Industrial Policy for the Globalisation Era	An Agenda for new skills and jobs	The European Platform against Poverty and Social Exclusion
Climate change and clean energy 'To limit climate change and its costs and negative effects to society and the environment.'	√√	√√		√√√	√√√		
Sustainable transport 'To ensure that our transport systems meet society's economic, social and environmental needs whilst minimising their undesirable impacts on the economy, society and the environment.'	√√	√√		√√	√√		
Sustainable consumption and production 'To promote sustainable consumption and production patterns.'	√	√		√√√	√√		
Conservation and management of natural resources 'To improve management and avoid overexploitation of natural resources, recognising the value of ecosystem services.'		√√		√√√	√√		
Public Health 'To promote good public health on equal conditions and improve protection against health threats.'	√√	√√				√	√√
Social inclusion, demography and migration 'To create a socially inclusive society by taking into account solidarity between and within generations and to secure and increase the quality of life of citizens as a precondition for lasting individual well-being.'	√√	√√	√√			√√√	√√√
Global poverty & sustainable development challenges 'To actively promote sustainable development worldwide and ensure that the European Union's internal and external policies are consistent with global sustainable development and its international commitments.'				√√			√√

NB: one tick (√) means less than 25 % of the operational objectives of an EU SDS key challenge were mentioned in the respective flagship initiative document; two ticks (√√) mean between 25 % and 75 %, and three ticks (√√√) mean over 75 %; empty cells mean that no references to the operational objectives were found in the flagship initiative document.

Source: European Sustainable Development Network

These synergies are also reflected in the EU set of Sustainable Development Indicators, which comprise the indicators presented in this report, and cover all of the Europe 2020 headline indicators ([39]).

Apart from the obvious links and synergies in the indicator set between the EU SDS and the Europe 2020 strategy, the EU SDS engages in a more comprehensive picture of sustainable development to better reflect social and environmental development. For example, the theme of 'global partnership' outlines the EU's responsibility for intra-generational equity by supporting the achievement of the Millennium Development Goals. Furthermore, the EU SDI set engages in the wider framework of societal progress and quality of life in particular that is taken into account by the themes 'public health', 'demographic changes' and 'social inclusion'.

In short, although the Europe 2020 strategy builds on the integrated approach of the EU SDS, the analysis presented in Table 0.2 shows that Europe 2020 generally follows more narrow approach, focusing on the growth-related aspects of a smart, sustainable and inclusive society. In this sense, this 2013 edition of the 'Sustainable Development in the EU' monitoring report aims at giving a broad, comprehensive picture of whether the EU is moving towards sustainable development based on the framework of objectives and targets as outlined in the EU Sustainable Development Strategy.

([39]) The theme 'socioeconomic development' includes the indicators 'Employment rate by gender, age group 20 to 64' and 'Gross domestic expenditure on R&D (GERD)'. The theme 'social inclusion' contains the bulk of the Europe 2020 headline indicators, namely 'People at risk of poverty or social exclusion' (used as headline indicator of this theme) and its three sub-indicators 'People living in households with very low work intensity', 'People at risk of poverty after social transfers' and 'Severely materially deprived people'. Additionally, the theme incorporates the two education indicators 'Early leavers from education and training' and 'Tertiary educational attainment'. The theme 'climate change and energy' draws on the indicators 'Greenhouse gas emissions', 'Share of renewable energy in gross final energy consumption', and 'Primary energy consumption', all of them being used as headline indicators of this theme.

1 Socioeconomic development

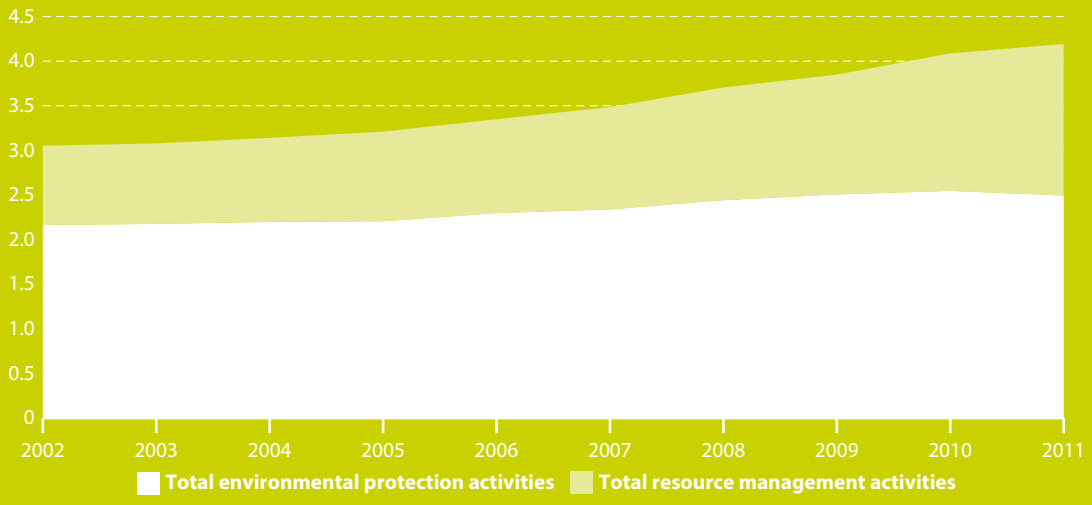
Socioeconomic development seen through the lens of the Green Economy

Green jobs on the rise – but are they decent jobs too?

The 'environmental goods and services sector' (EGSS) comprises production activities that generate environmental products. Environmental products are products that have been produced for the purpose of environmental protection or resource management.

From 2002 to 2011, employment in the EGS sector (based on estimated data for the EU as a whole) increased by some 37 %. In 2012, about 4.2 million people (in full-time equivalents) were employed in this sector, a majority of them in environmental protection activities, which include preventing, reducing and eliminating pollution and any other degradation of the environment. However, employment growth in resource management activities (covering preservation and maintenance of the stock of natural resources and hence safeguarding it against depletion) contributed most to the overall increase in employment in the EGS sector. Between 2002 and 2011 employment (in full-time equivalents) in this area almost doubled.

Employment in the environmental goods and services sector, EU-28
(millions of full-time equivalent)

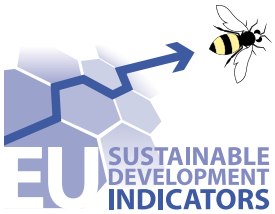


NB: Estimated data

Source: Eurostat (online data code: **env_ac_egss1**)

The increase in employment in the EGS sector in the EU is in line with the findings of a recent ILO/UNEP study (1), according to which the shift to a greener economy is creating employment across a range of sectors. However, a greener economy is not inclusive and socially sustainable by default, and the transition phase is likely to entail some challenges, particularly within certain sectors and for certain workers. Consequently, a comprehensive approach is needed that ensures that green jobs are also decent jobs that contribute to social inclusion.

(1) ILO and UNEP, *Working towards sustainable development — opportunities for decent work and social inclusion in a green economy*, 2012.



Overview of main changes

Many of the changes in the socioeconomic development theme's indicators have been influenced by the financial and economic crises from 2008 and the prolonged recession that followed. The slowdown in economic activity not only directly restrained real gross domestic product (GDP) growth, but also led to subdued investment, increased unemployment and to a lesser extent restrained household saving. The employment trend also deteriorated, although it did stabilise over the past two years. Overall expenditure on research and development (R&D) remained more resilient, but it lacked the impetus to stay on-course to meet its 2020 target. There were also positive developments: labour productivity increased and energy intensity declined. However, it is too early to interpret these trends as major turnarounds. They might reflect delayed economic adjustments or turbulence rather than actual long-term improvements.

Table 1.1: Evaluation of changes in the socioeconomic development theme (EU-27, from 2000) (1)

Level 1	Level 2	Level 3
Real GDP per capita	**Economic development**	
	Investment	Household saving
	Innovativeness, competitiveness and eco-efficiency	
	Labour productivity	Research and development expenditure
		Energy intensity
	Employment	
	Employment	Unemployment

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.

Socioeconomic development seen through the lens of Quality of Life

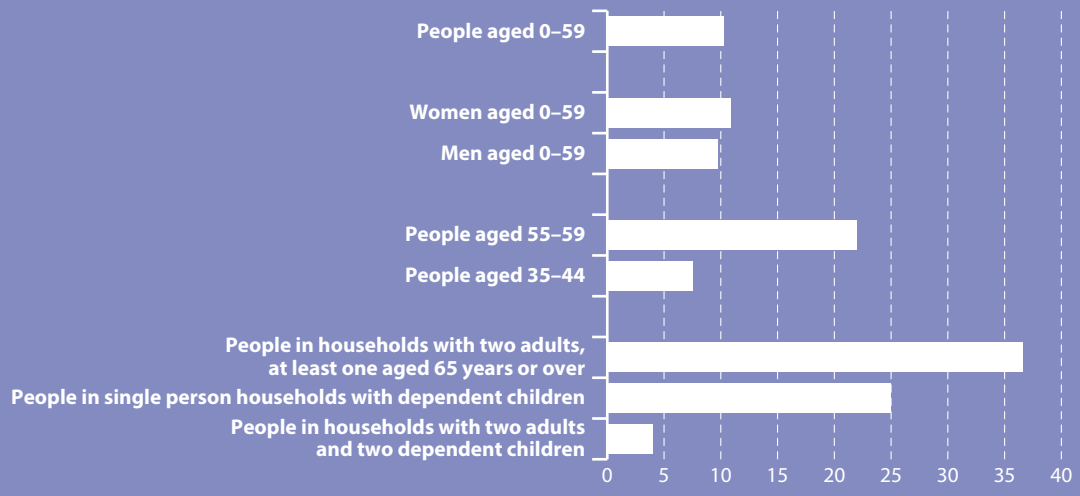
Underemployment has increased since the onset of the crisis

Underemployment covers people who, in spite of being employed, do not work full-time and lack a sufficient volume of work; a situation that is somewhat similar to being unemployed.

In 2012, some 38.9 million people aged 0 to 59 years, corresponding to 10.3 % of the EU population of that age group, were living in households where the adults worked less than 20% of their total work potential during the past year. Compared with 2008, this represents an increase of about 4.5 million people affected by underemployment.

Women were slightly more affected by this situation in 2012 than men. Low work intensity was also much higher among older workers, in particular those aged 55 to 59, whereas it was lowest for prime-aged workers 35 to 44 years old. With the exception of single person households with dependent children (which usually suffer most from any form of poverty or social exclusion), households with one or more dependent children showed the lowest underemployment levels in 2012.

People living in households with very low work intensity by sex, age and household type, EU-27, 2012
(% of population)



NB: Estimated data.

Source: Eurostat (online data codes: ilc_lvhl11 and ilc_lvhl13)

Why do we deal with socioeconomic development?

By promoting a prosperous, innovative, knowledge-rich, competitive and eco-efficient economy that provides high living standards and high-quality employment, socioeconomic development aims to harmonise the three main pillars of sustainable development: economic development, protection of the environment and social justice.

Gross domestic product (GDP) is the best known measure of macro-economic activity. For decades it has been regarded as a proxy indicator for societal progress. However, by design and purpose, it cannot be relied on to inform on all policy-related issues. The deficiencies in its use as a measure of well-being have been increasingly recognised. Nevertheless, GDP is closely linked to a number of issues highly relevant for economic development, such as employment or R&D investment. Reflecting changes in consumption and production patterns, GDP growth is also linked to resource use and climate change, especially when not matched by similar increases in resource efficiency. It is important to mention that the availability of economic resources determines the potential for the technological and scientific innovations needed for a switch to 'low-carbon' (an economy in which production and consumption processes emit little or no carbon dioxide) and resource-efficient economies.

The economic dimension of socioeconomic development is analysed in view of investment and household saving. Investment has a direct impact on the future prosperity of an economy because it contributes to the accumulation of capital goods, either in the form of physical capital or knowledge ([2]). Household saving has an important role in sustainable development, particularly in terms of ensuring intergenerational equity in the distribution of resources and opportunities. As household saving provides the funds to finance capital investment, the household saving rate determines the amount of financial resources available to invest in improving the stock of productive, natural and human capital.

An economy's capacity for innovation, competitiveness and eco-efficiency is analysed through the issues of labour productivity, R&D and energy intensity. R&D expenditure, through its links to education, innovation, employment, labour productivity and economic growth, is crucial for the prosperity and competitiveness of EU economies. Expanding scientific and technological knowledge provides the ability to tackle some of the most pressing societal challenges such as climate change, population ageing, labour market attainment and security of material supply. The formation of human capital (the skills, knowledge and experience possessed by an individual or population) through education and training supports the advancement of academic knowledge and innovative technologies, which in turn contribute to job creation, labour productivity and resource efficiency. Labour productivity is an important determinant of an economy's competitiveness and long-term economic growth.

Sustained economic growth, however, if not counterbalanced by improvements in eco-efficiency, can cause considerable damage to the natural environment, jeopardising ecosystems and thus significantly affecting well-being in the long term. Sustainable development relies on ensuring economic prosperity while minimising environmental pressures and avoiding over-exploitation of resources. An economy's energy intensity is important in this respect because it provides an indication of its progress in decoupling economic growth from environmental degradation.

Employment is essential for well-functioning and competitive economies. A high employment rate contributes to a more inclusive society by reducing poverty and inequality between regions and social groups. Apart from generating the income necessary for good living standards, paid work has a wider role to play in people's lives. It provides opportunities for meaningful engagement in society, promoting a sense of self-worth, purpose and social inclusion. Large and persistent unemployment, on the other hand, can lead to social exclusion, degradation of individual skills and increased poverty, which will end in economic slowdown.

([2]) Recent improvements in the methodological framework underlying the compilation of the European System of National and Regional Accounts (ESA 2010), which will be used for data transmissions from September 2014, underline the importance of this aspect by reclassifying expenditures on R&D from intermediate consumption to capital formation. See: Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union Text with EEA relevance; further information on http://epp.eurostat.ec.europa.eu/portal/page/portal/esa_2010/introduction.

How does the EU tackle socioeconomic development?

Socioeconomic development represents one of the seven key challenges identified under the EU Sustainable Development Strategy (EU SDS) ([3]). The policy imperative in this respect is the promotion of a 'prosperous, knowledge-rich, competitive and eco-efficient economy, which provides high living standards and full and high-quality employment throughout the EU'.

The Europe 2020 strategy ([4]) aims to tackle the short-term challenges of the crisis and prepare the EU economy for the coming decade. Under its priorities of smart, sustainable and inclusive growth, the strategy has set targets on increasing EU expenditure on R&D to 3 % of GDP, increasing energy efficiency by 20 % and raising the employment rate of 20 to 64 year olds to 75 %, to be achieved by 2020.

These targets are supported by the Europe 2020 strategy's flagship initiatives 'Innovation Union' ([5]), 'Digital Agenda for Europe' ([6]), 'Youth on the Move' ([7]), 'An Agenda for New Skills and Jobs' ([8]), 'An Industrial Policy for the Globalisation Era' ([9]) and 'Resource Efficient Europe' ([10]). The employment target is furthermore promoted through the so-called 'Employment Package' ([11]), which seeks to create more and better jobs throughout the EU.

Further reading on socioeconomic development

Eurostat, *Science, Technology and Innovation in Europe*, 2013 edition, Luxembourg, Publication Offices of the European Union, 2013.

Eurostat Pocketbooks, *Science, technology and innovation in Europe*, 2012 edition, Luxembourg, Publication Offices of the European Union, 2012.

Eurostat, *Individual employment, household employment and risk of poverty in the EU: A decomposition analysis*, Luxembourg, Publication Offices of the European Union, 2013.

European Commission, *Innovation Europe Competitiveness Report*, Luxembourg, Publication Offices of the European Union, 2011.

OECD, *Sustainable Development: Linking economy, society and environment*, 2008.

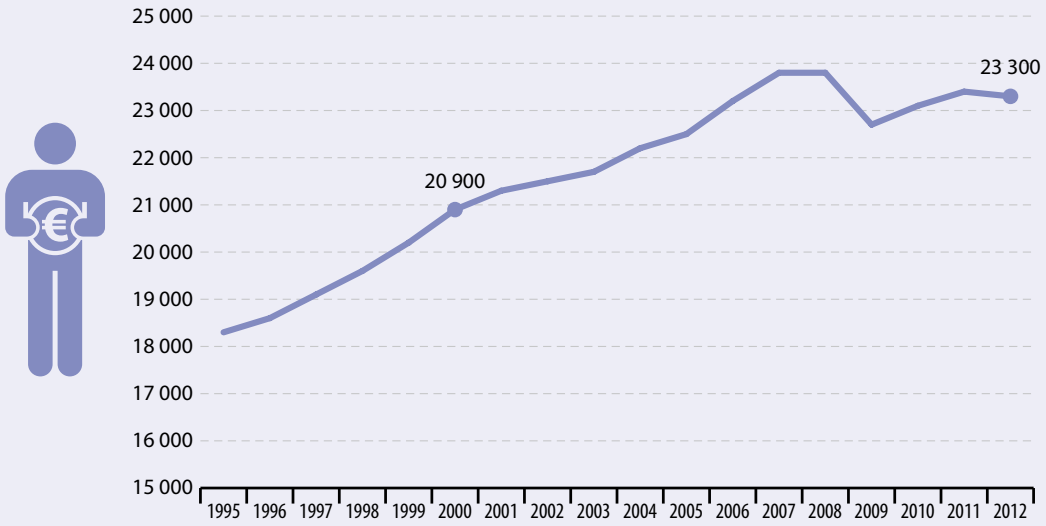
United Nations, *Analysing and measuring social inclusion in a global context*, New York, United Nations publication, 2010.

([3]) Council of the European Union, *2009 Review of the EU Sustainable Development Strategy*, Presidency report,16818/09.
([4]) Commission Communication, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final.
([5]) Commission Communication, *Europe 2020 Flagship Innovation Union*, COM (2010) 546 final; see also Commission communication, State of Innovation Union 2012 — Accelerating Change, COM (2013), 149 final.
([6]) Commission Communication, *A Digital Agenda for Europe*, COM (2010) 245 final/2.
([7]) Commission Communication, *Youth on the Move: An initiative to unleash the potential of young people to achieve smart, sustainable and inclusive growth in the European Union*, COM (2010) 477 final.
([8]) Commission Communication, *An agenda for new skills and jobs: A European contribution towards full employment*, COM (2010) 682 final.
([9]) Commission Communication, *An integrated industrial policy for the globalisation era*, COM (2010) 614.
([10]) Commission Communication, *A resource efficient Europe — Flagship initiative under the Europe 2020 Strategy*, COM (2011) 21.
([11]) Commission Communication, *Towards a job-rich recovery*, COM(2012) 173 final.

Real GDP per capita

11.5 % increase in real GDP per capita in the EU between 2000 and 2012. Economic activity picked up in 2010 and 2011, but slowed again the following year

Figure 1.1: Real GDP per capita, EU-27
(EUR per inhabitant)



Source: Eurostat (online data code: tsdec100)

Before the economic crisis of 2008, GDP per capita in the EU was continually on the rise with an average growth between 1995 and 2007 of 2.4 %. This trend was interrupted by the sudden economic slump, which started in 2008 and fully hit the EU in 2009 with the economy shrinking by 4.8 %. In line with the development of GDP, net national income was also abruptly affected by the economic crisis, falling from EUR 21 500 per inhabitant in 2008 to 20 000 in 2009.

How does the economy respond to anti-crisis policies?

Decisive policy actions at national and European level in response to the crisis, including rescue packages for the most troubled economies, provision of fiscal stimulus and banking sector support, helped improve confidence and financial conditions for sovereigns and banks ([12]). These measures contained some of the gravest short-term economic risks and brought about moderate growth in GDP of 1.7 % and 1.4 % in 2010 and 2011 respectively. In 2012, GDP per capita fell by 0.6 %, mainly as a result of the delayed translation of financial market improvements into easing of private sector borrowing conditions and weak private consumption and investment, stemming from a renewed volatility in market sentiment during this period ([13]). The adopted policy measures had a favourable effect on net national income, which started steadily increasing in 2010 and grew overtook pre-crisis levels in 2012.

Net national income *is the sum of income from all sectors plus net receipts of wages, salaries and property income from abroad, minus the depreciation of fixed capital assets.*

Fiscal stimulus *involves Government measures aimed at supporting economic growth. These normally include increases in public spending (thereby creating more jobs) or a reduction in taxation (thereby increasing people's purchasing power).*

([12]) International Monetary Fund, *World Economic Outlook 2013: Hopes, Realities, Risks,* p. 1.
([13]) European Commission, *European Economic Forecast*, Spring 2013, p. 2 and p. 9; International Monetary Fund, *World Economic Outlook 2013: Hopes, Realities, Risks*, p. 47.

Box 1.1: EU measures for tackling the economic crisis

The Stability and Growth Pact (SGP) is a rule-based framework aimed at maintaining the stability of the economic and monetary union. The SGP contains two arms: the preventive arm seeks to ensure fiscal policy is carried out in a sustainable manner over the cycle, while the corrective arm sets out the framework for countries to take corrective action in the case of an excessive deficit.

The macroeconomic imbalance procedure (MIP) and the excessive deficit procedure (EDP) are based on the SGP. The MIP is intended to monitor the build-up of persistent macroeconomic imbalances and serve as an early warning system. A MIP scoreboard of 11 indicators provides information for the identification of external and internal macroeconomic imbalances. Internal imbalances refer to public sector indebtedness, financial and asset market developments and other general trends such as private sector credit flows and unemployment. External imbalances are related to current account developments and trends in real effective exchange rates, share of world exports and nominal unit labour costs.

The EDP is a part of the corrective arm of the SGP. Its main purpose is to enforce compliance with budgetary discipline and ensure Member States take corrective actions in a timely and durable manner. The EDP operationalises the limits on the budget deficit and public debt on the basis of the following thresholds enshrined in the Treaty: government deficit within 3 % of GDP and gross debt not exceeding 60 % of GDP without diminishing at a satisfactory pace.

In November 2008, the European Economic Recovery Plan for Growth and Jobs (EERP) was launched by the EU as a comprehensive strategy for a coordinated response to the economic crisis. It included a combination of tax and expenditure measures to boost demand and restore confidence in the European economy. The plan called for an immediate stimulus package of about EUR 200 or 1.5 % of EU GDP at national and EU level. On average the fiscal stimulus implemented by EU Member States in 2009-2010 is estimated to amount to up to 2 % of GDP ([14]).

The EU adopted a number of emergency recovery packages to protect the worst-affected countries from bankruptcy and prevent the crisis spreading to other economies in the region. The first bailout programme, which amounted to EUR 110 000 million, was implemented in May 2010 when Greece requested financial assistance from the EU ([15]). Ireland and Portugal requested similar assistance in November 2010 and May 2011, EUR 85 000 million and EUR 78 000 million respectively ([16])([17]). Spain also received a EUR 100 000 million rescue package in June 2012 to recapitalise its banks ([18]).

Stabilisation of the banking sectors of the most afflicted countries was another important step in tackling the crisis. This was achieved through a series of EU/IMF support programmes for recapitalisation and restructuring of crisis-hit banks including debt guarantees, equity injections and asset purchases. These measures have been crucial for preserving financial stability across Europe by preventing liquidity from seizing-up in peripheral countries.

In December 2011 economic and fiscal governance in the EU and the euro area was fundamentally strengthened as a reinforced Stability and Growth Pact (SGP) entered into force with new rules for economic and fiscal surveillance. These new measures, the so-called 'six-pack' ([19]), consist of five regulations and one Directive. These aim to strengthen the procedures to reduce public deficits and address macroeconomic imbalances.

The 'two-pack' is the latest European legislative measure on improving macroeconomic surveillance. It builds on the set of rules already agreed in the 'six-pack'. The first regulation requires countries to present their draft budgets to the European Commission at the same time each year. The Commission will then have the right to assess and, if necessary, issue an opinion on them. The regulation also proposes closer monitoring and reporting requirements for eurozone countries in the EDP. The second regulation sets out explicit rules and procedures for enhanced surveillance of any eurozone country in distress.

([14]) European Commission, Directorate-General for Economic and Financial Affairs, *Economic Crisis in Europe: Causes, Consequences and Responses*, 2009, p. 43.
([15]) European Commission, Directorate General for Economic and Financial Affairs, *The Economic Adjustment Programme for Greece*, Interim Review, 2010, p. 4.
([16]) Council of the European Union, *Council Implementation Decision of Granting Union Financial Assistance to Ireland*, 2010, p. 6–7.
([17]) European Commission, Occasional Papers 79, *The Economic Adjustment programme for Portugal*, 2011, p. 28.
([18]) European Commission, Occasional Papers 118, *European Economy, The Financial Sector Adjustment Programme for Spain*, 2012, p. 29–30.
([19]) For more information on the specific measures under the 'six-pack' see http://ec.europa.eu/economy_finance/articles/governance/2012-03-14_six_pack_en.htm

Growth prospects remain uncertain

Although the most acute economic distress in the EU has been mitigated, real activity is still held back by continued fiscal consolidation measures, weak business and consumer confidence and an uncertain economic outlook. There has also been a noticeable spillover of weakness from peripheral economies into the core. As a result, near-term estimates for potential growth have been marked down. In 2013 growth in GDP per capita is expected to slow down, increasing only by 1.3 % in the EU and by 0.9 % in the euro area ([20]) compared with 2012 levels. Since GDP growth reflects an economy's dynamism and job creation potential, weak growth poses a challenge for bringing down high unemployment rates across the EU. However, under the assumption of continued policy efforts for financial market improvements and economic adjustments at the EU and Member State-level, GDP is expected to pick up again and rise by 2.6 % in 2014.

Fiscal consolidation *describes government policy intended to reduce deficits and the accumulation of debt.*

How GDP growth varies between Member States

While no Member State has remained immune to the financial and economic crisis, recovery has continued to diverge across the EU. In most of Europe growth levels have stabilised, but the drag on economic activity has lingered longer in Greece, Spain, Portugal, Italy, Cyprus, the United Kingdom and Ireland. These countries either had unsustainable pre-crisis balance sheets or real estate property bubbles. Even countries that did not accumulate external imbalances, such as Germany, experienced a deterioration in economic growth as a result of shrinking EU export demand and business uncertainty ([21]). Central and Eastern European economies, which already had more stable balance sheets, showed a more sizable growth recovery in the period 2007–2012, despite the noticeable spill-over effects from more troubled economies. Poland performed exceptionally well, being the only EU economy to maintain economic growth even during the crisis. Among other factors, the divergence in economic growth is likely to be affected by cross-country differences in fiscal positions, macroeconomic and structural policies, and continued financial fragmentation in the EU as a result of heterogeneity in debt overhang in the private sector.

What is the household perspective of economic welfare?

Although GDP per capita is an important and widely used indicator of a country's economic welfare, the indicator on actual individual consumption (AIC) provides a particular insight into the relative material welfare of consumers in different countries. AIC includes all goods and services purchased directly by households. Luxembourg has the highest AIC level, but this is substantially lower than its GDP. This is because it has a large number of cross-border workers who contribute to its GDP but buy most of their goods and services in their own country of residence. Interestingly, despite having the third largest GDP per capita, Ireland has AIC levels below the EU average. The exceptionally low AIC levels in Bulgaria and Romania — 48 and 49 respectively — are in line with their very low GDP levels.

EU trends in GDP compared with other countries in the world

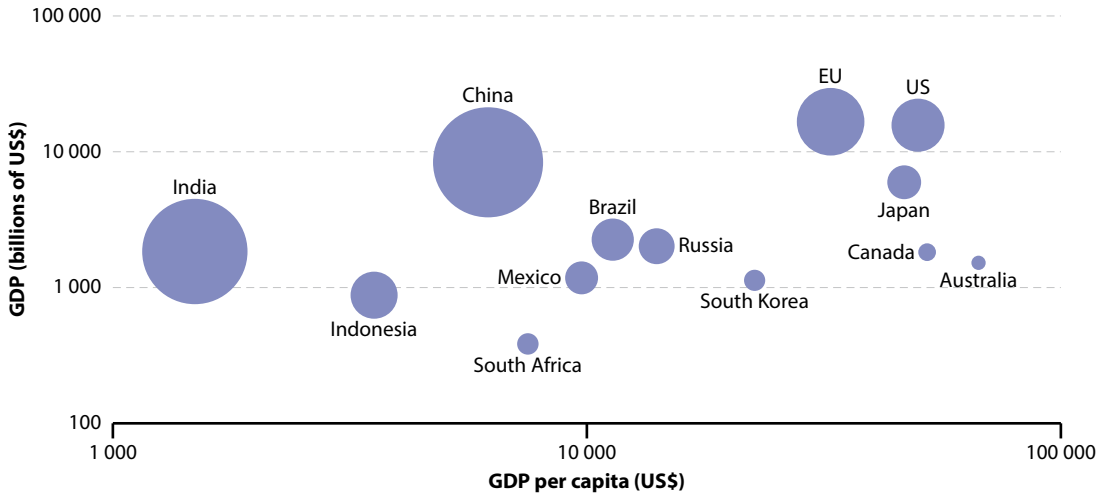
Recovery from the global economic crisis in the EU has been slower than in other parts of the world. This is because economic activity was largely subdued by the protracted effects of the euro area crisis and continued strains from fiscal consolidation needs and credit market weaknesses ([22]). The United States, which also had large pre-crisis imbalances, has experienced a faster recovery. Large emerging economies without substantial pre-crisis imbalances, such as Brazil, Russia, India and China, grew strongly in the recovery period. OECD projections suggest growth will remain higher in the United States than in the euro area despite strong consolidation efforts, the accommodative monetary policy and the financial sector strengthening ([23]). Until around 2020, China is projected to have the highest growth rate, but it could be then surpassed by India ([24]).

Despite growth rate differentials between the EU and other regions, the EU economy is still the world's largest. In 2012, the 27 EU Member States together produced a GDP of 16.63 trillion US dollars, followed by the

([20]) The euro area consists of those Member States of the European Union that have adopted the euro as their currency (Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Malta, Netherlands, Portugal, Slovakia, Slovenia and Spain).
([21]) European Commission, *European Competitiveness Report 2012, Executive Summary*, p. 5.
([22]) OECD, *Economic Outlook*, Vol 2013/1, p. 10.
([23]) OECD, *Economic Outlook*, Vol 2013/1, p. 11.
([24]) OECD, *Economic outlook*, Vol 2013/1, p. 194.

United States, China and Japan. Living standards in the EU, as measured by GDP per capita, remain some of the highest in the world, surpassed only by Australia, the United States, Canada and Japan. Therefore, the high growth rates in other parts of the world — middle-income economies in particular — reflect the fact that they are catching up with Europe and other advanced economies. After reaching a certain level, the high growth rates in China and India are projected to level off, whereas Africa is projected to experience some of the highest growth rates between 2030 and 2050 ([25]).

Figure 1.2: The EU compared with other economies in the world, 2012



NB: The size of the bubbles reflects the population size.

Source: World Bank

What lies beneath this indicator?

Growth in GDP per capita helps create new jobs and generates additional economic resources for long-term investment, which is crucial for supporting sustainable growth. When based on the increased use of natural resources, however, economic growth might increase environmental pressures and negatively affect future consumption possibilities. By contrast, tapping alternative growth sources such as technological innovation or advancement in education and human skills could break this link by decoupling environmental pressures from economic growth ([26]).

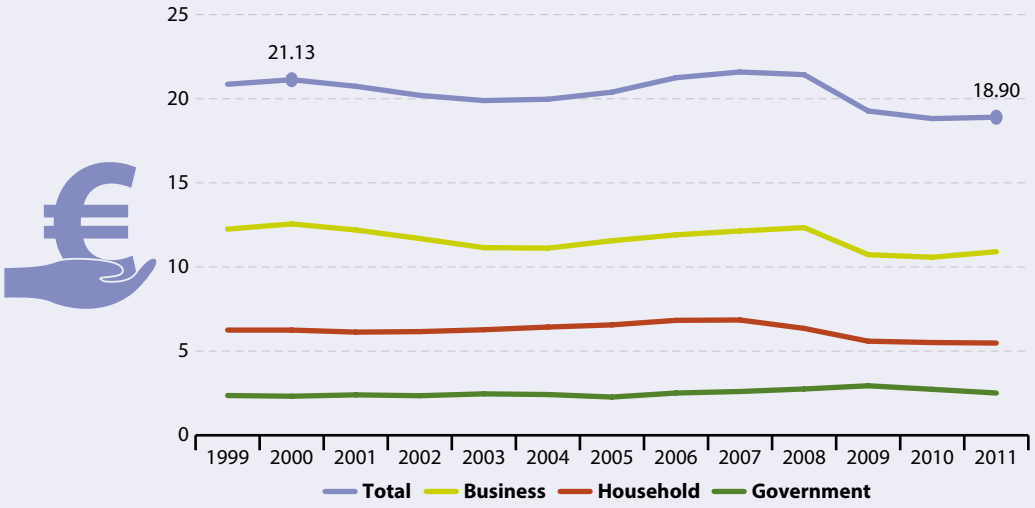
Real GDP per capita is calculated as the ratio of real GDP to the average population in a specific year. It is often used as an indicator of how well off a country is because it is a measure of average real incomes. GDP is a measure of economic activity; it is the value of total output of goods and services produced by an economy within a certain period of time, less intermediate consumption, plus net taxes on products and imports. There are three ways in which GDP can be measured: output, expenditure or income. From the expenditure side, GDP is comprised of private final consumption, government final consumption, gross fixed capital formation, changes in inventories, and net exports (the difference between imports and exports of goods and services). Although per capita income is widely used as a proxy for prosperity, it is not a full measure of well-being because it does not account for some social issues; for example, the equality of income distribution or the value of non-market services (such as household labour or voluntary work) that are relevant to individual well-being.

([25]) OECD, *Environmental Outlook to 2050: The Consequences of Inaction*, 2012, p. 46.
([26]) OECD, *Environmental Outlook to 2050: The Consequences of Inaction*, 2012, p. 52.

Investment

10.5 % reduction in total investment in the EU between 2000 and 2011. This trend was largely driven by a sharp fall in private investment in the aftermath of the economic crisis

Figure 1.3: Investment by institutional sectors, EU-27
(% of GDP)



Source: Eurostat (online data code: tsdec210)

The share of GDP used for gross investment in the EU followed the economic cycle. The economic downturn in 2000 to 2003 was marked by a sizable reduction in investment in GDP to a low of 19.9 % in 2003. This was mainly driven by a slowdown in business investment. From 2003 onwards, an expansion in business spending has placed investment spending on a steadily increasing path, with the indicator exceeding the growth rate of GDP. After total investment reached a cyclical peak of 21.6 % in 2007, spending fell sharply in the period 2008 to 2010.

Crisis hit private investment hardest

The slump in total investment during the economic downturn did not come as a surprise as investment expenditure is normally a highly cyclical and volatile component of GDP. A series of negative economic events — the collapse of real estate and property bubbles, the financial and sovereign debt crises and the following economic recession, and uncertainty about the future of the euro — dampened business and consumer confidence. As a result, the adverse impacts of the crisis became visible in the unprecedented decline in household (– 20 %) and business (– 10 %) investment levels between 2007 and 2011.

In fact, private investment was the hardest-hit component of the EU's GDP during the economic downturn ([27]). As lending standards tightened and consumer wealth declined, due to a fall in asset prices, households saved money instead of spending it on durables and housing ([28]). Apart from the high economic uncertainty and large decline in growth expectations, business investment was also affected by the reduced access to finance due to tightened credit conditions, especially for small and medium-sized enterprises ([29]).

Against the collapse of private investment, government investment experienced a moderate increase — from 2.6 % of GDP in 2007 to 2.9 % in 2009 — as a direct result of countercyclical fiscal measures widely adopted in response to the economic crisis (see Box 2.1). In 2011, however, at the background of ambitious

Business and consumer confidence *is the degree to which consumers and firms feel confident about their financial position and the overall state of the economy. This influences how much money they are willing to spend.*

([27]) McKinsey Global Institute, *Investing in Growth: Europe's next challenge*, 2012, p. 11.
([28]) European Commission, *Economic crisis in Europe: Causes, Consequences and Responses*, 2009, p. 24.
([29]) McKinsey Global Institute, *Investing in Growth: Europe's next challenge*, 2012, p. 4.

fiscal consolidation programmes across most Member States, the EU average government investment fell sharply, reaching 2006 levels (2.51 %).

***Countercyclical fiscal measures** are policy measures which counteract the effects of the economic cycle. For example, countercyclical fiscal policy actions when the economy is slowing would include increasing government spending or cutting taxes to help stimulate economic recovery.*

EU trends in investment compared with other countries in the world

The crisis in private investment against the backdrop of the economic downturn is not an exclusively EU phenomenon. Other major economies, including the United States and Japan, experienced a comparable contraction in private investment between 2007 and 2011. However, in these two countries the negative impact on growth as a result of the sharp fall in investment has been moderated by an increase in private consumption ([30]). Furthermore, in line with the EU's expansionary policy in response to the economic and financial crisis, most major economies around the world embarked on unprecedented stimulus packages, ranging from 6 % of GDP in the United States to 12 % in China ([31]).

What lies beneath this indicator?

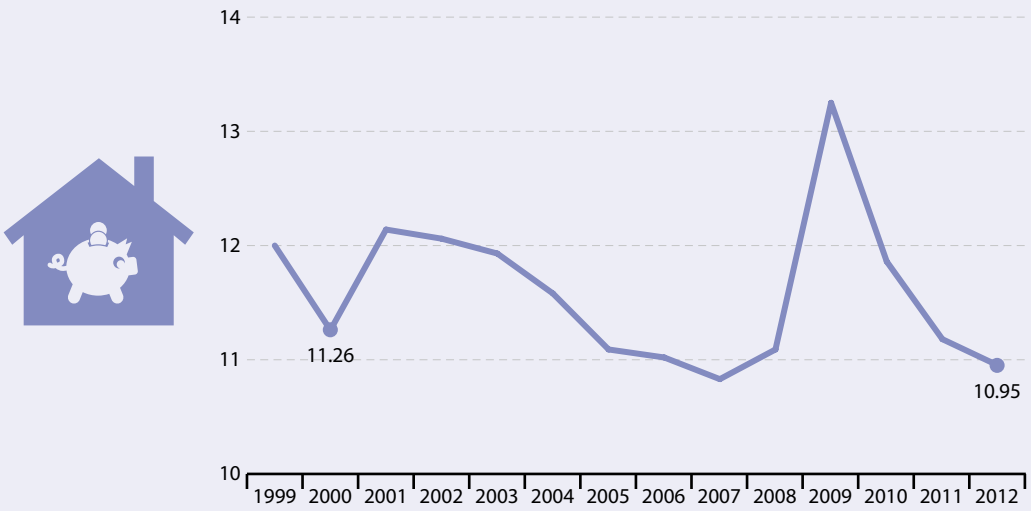
Investment as a percentage of GDP represents spending that enhances the productive capacity of an economy. This determines the development of living standards in the medium and long terms. The acquisition of capital goods can encompass, among other things, energy and transport infrastructure, industrial and service facilities, eco-innovative technologies, and education and R&D. Long-term investment that is economically, environmentally and socially sound is crucial for supporting sustainable growth. This indicator accounts for the share of GDP that is used for gross investment (rather than, for example, for consumption or exports). It is defined as total fixed capital formation (GFCF) expressed as a percentage of GDP, for the public and private sectors.

([30]) McKinsey Global Institute, *Investing in Growth: Europe's next challenge*, 2012, p. 15.
([31]) ILO, *A Review of Global Fiscal Stimulus*, 2011, p. 2.

Household saving rate

0.2 percentage point drop in the household saving rate in the EU between 2000 and 2012. After a sharp increase in 2009 the rate fell significantly as result of slow growth and high household debt in some Member States

Figure 1.4: Household saving rate, EU-27
(%)



NB: EU-27 aggregate based on data from 23 EU Member States (no data available for BG, EL, MT and RO).

Source: Eurostat (online data code: tsdec240)

The household saving rate climbed to 12.14 % in 2001 as financial distress from the 2000–2003 economic downturn took a toll on consumer spending. This was followed by a prolonged period of steady decline in the saving rate between 2003 and 2007, possibly driven by a combination of low interest rates and low and stable inflation, boosting customer's demand for credit. The falling trend was again reversed in 2008 with the onset of the economic crisis.

Households responded to the crisis by saving

The household saving rate is normally very sensitive to uncertainty over the economy and interest rates, so it is not surprising that in 2009 the indicator reached a decade-long high of 13.25 %. Over the period 2010–2012 the household saving rate gradually fell to its pre-crisis level. With households in some Member States still needing to reduce debt and the prospect of fragile employment growth, the household saving rate is expected to remain weak. Furthermore, expectations of continued weak employment growth are likely to exert further downward pressure on households' disposable incomes and their propensity to save ([32]).

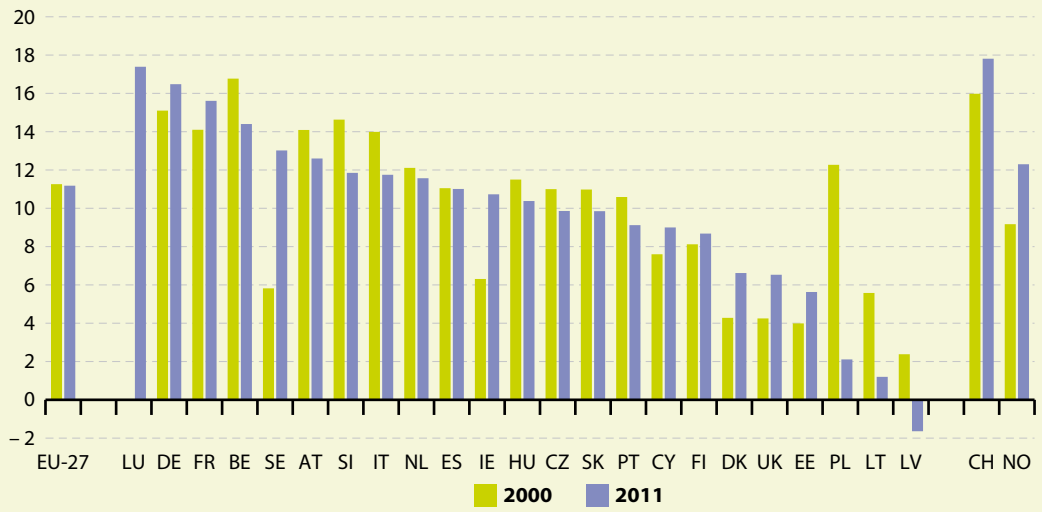
How household saving rates vary between Member States

In 2011 the saving rate of households across EU Member States ranged from – 1.6% in Latvia to above 17 % in Luxembourg. The average household saving rate was particularly low in Baltic countries (– 1.6 % in Latvia, 1.2 % in Lithuania and 5.6 % in Estonia), Poland (2.1 %) and the UK (6.5 %). The other side of the spectrum was dominated by a number of Northern and Central European countries with household saving rates well above the EU average (17 % in Luxembourg, 16.4 % in Germany and 15.6 % in France). The majority of Member States experienced a reduction in their household saving rate over the period 2000 to 2011,

([32]) European Commission, *European Economic Forecast*, Spring 2013, p. 2.

with the most pronounced change being observed in Poland (– 10.2 %). Variations in the household saving rate across countries could be a result of a combination of factors, including among others income tax rate, inflation rate, structure of the pension system, stock and housing prices, and real interest rates.

Figure 1.5: Household saving rate, by country



NB: EU-27 aggregate based on data from 23 EU Member States (no data available for BG, EL, MT and RO); 2002 data for IE (instead of 2000).

Source: Eurostat (online data code: tsdec240)

Household disposable income *is the total amount of money households have available for spending and saving after subtracting income taxes and pension contributions.*

Final consumption *is the expenditure on goods and services that are used for the direct satisfaction of individual needs or wants.*

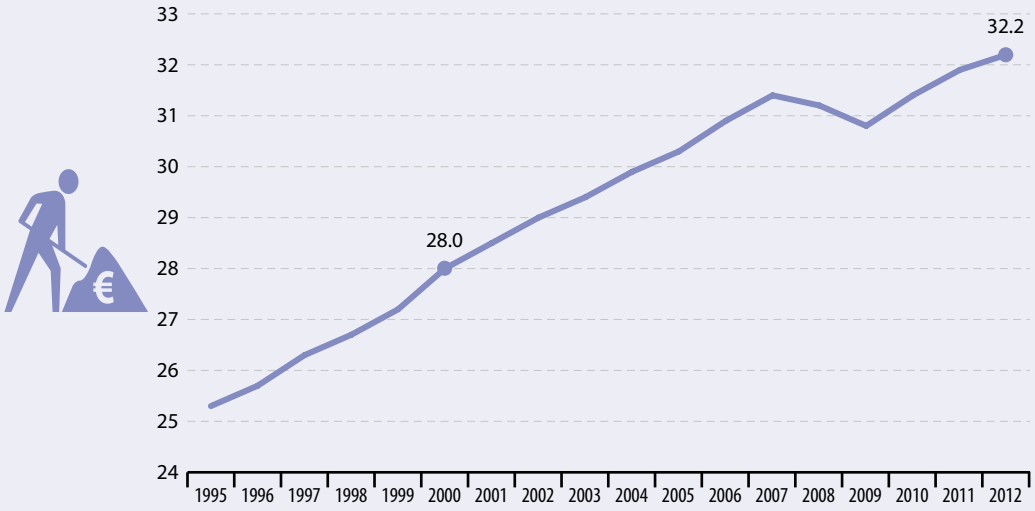
What lies beneath this indicator?

The household saving rate comprises the largest part of the total saving in the economy, so it is essential for the allocation of an economy's financial resources. In the short term the household saving rate is important for cushioning economic fluctuations because it allows households to smooth their consumption over time, responding to big changes in their income. In the long term the household saving rate is a key determinant of an economy's potential growth and its capacity to invest in productive, natural and human capital for future generations. The household saving rate represents the proportion of household disposable income that is not spent on final consumption and can instead be invested.

Labour productivity

15 % increase in output per hour in the EU between 2000 and 2012. The continuous increase in labour productivity stalled during the economic downturn before picking up again slowly in 2010

Figure 1.6: Labour productivity per hour worked, EU-27
(EUR per hour worked)



Source: Eurostat (online data code: tsdec310)

Worker productivity in the EU increased steadily between 2000 and 2007. After that until 2009 it stalled at about EUR 31 per hour worked. The slowdown in productivity during the recession might reflect weak investment under conditions of high economic uncertainty, resulting in slow capital accumulation ([33]). Weak productivity could also result from companies retaining labour during the downturn, leading to underuse of labour and spare capacity ([34]). In 2010 labour productivity rebounded and started growing, albeit at a very low rate. In 2012 output per worker increased to EUR 32.2 per hour against the backdrop of falling GDP. During an economic recovery, productivity initially rises as firms increase the work intensity of employees instead of hiring new workers. However, as firms start taking on more workers this boost in productivity is likely to level off.

How productivity varies between Member States

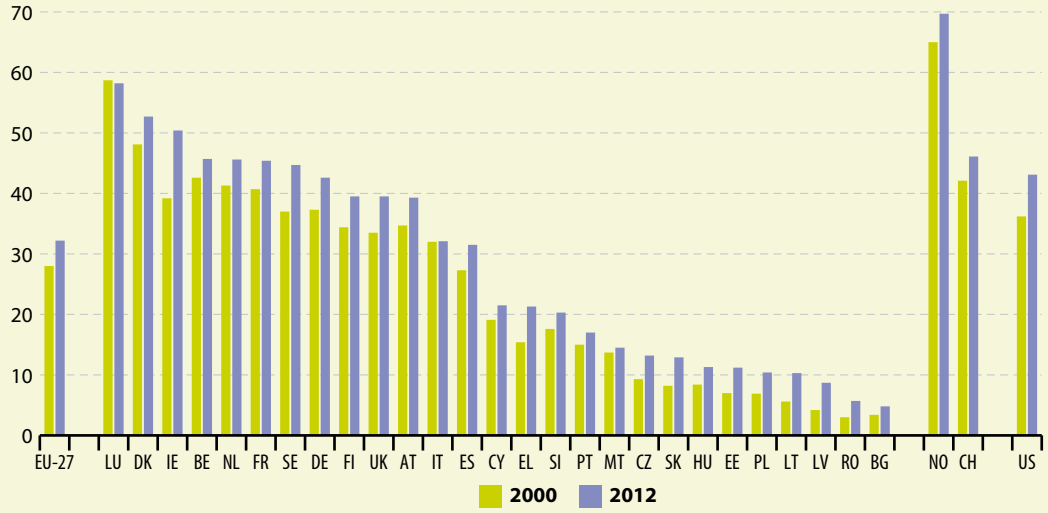
Although productivity levels grew in all Member States over the past decade, there is still considerable variation in productivity across Europe. In 2012, Luxembourg, Denmark and Ireland had the most efficient workers, producing an output of EUR 58.2, 52.7 and 50.4 per hour respectively. On the other side of the spectrum, labour productivity in 11 Member States was less than EUR 20 per hour.

The large divergence in productivity rates within the Union has been identified as an important structural weakness and one of the underlying causes of the economic crisis. Internal and external structural adjustment programmes, such as limiting unsustainable residential investments and improving export performance, are taking place in Ireland, Greece, Spain, Cyprus, Portugal and Slovenia. In these countries wage growth did not match productivity gains before the crisis. These measures are expected to rebalance labour

([33]) European Commission, *European Economic Forecast*, Autumn 2010, p.48.
([34]) Among other factors, this might have been caused by the rigid employment protection legislations in many Member States, increasing labour market inflexibility and substituting lay-offs with work-sharing and reduced working hours.

productivity, boost competitiveness and improve economic performance ([35]). Economies in Central and South-Eastern Europe experienced the most pronounced increases in labour productivity between 2000 and 2012: Latvia (107 %), Romania (90 %), Lithuania (84 %), Estonia (60 %) and Slovakia (57 %).

Figure 1.7: Labour productivity per hour worked, by country
(EUR per hour worked)



NB: 2002 data for LU (instead of 2000), 2008 data for CH, 2009 data for US.

Source: Eurostat (online data code: tsdec310)

GDP deflated is a measure of GDP that is adjusted for inflation.

What lies beneath this indicator?

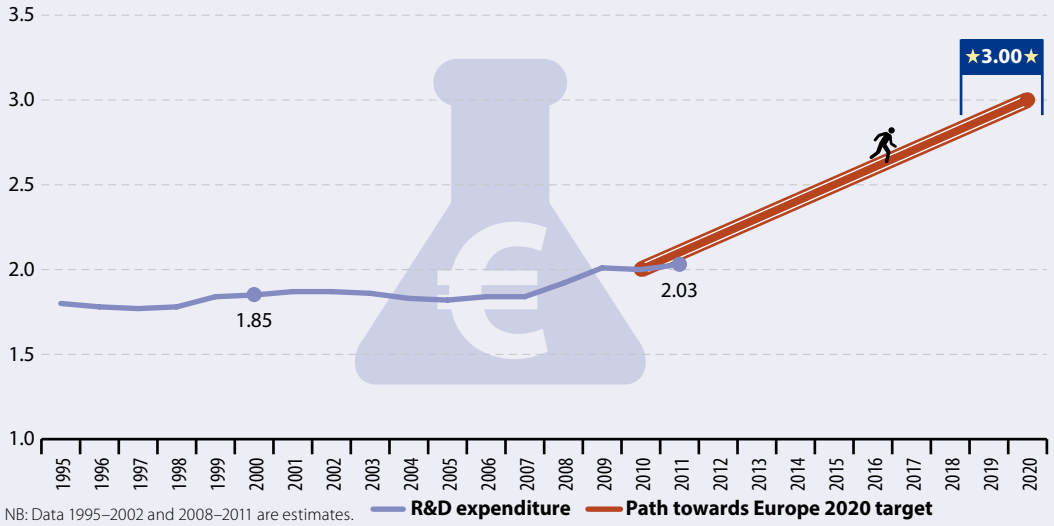
As a main source of economic growth, labour productivity is a key determinant of the future competitiveness and prosperity of the EU economy as well as its population's living standards. Technological innovations together with improvements in organisation and physical and human capital (health and skills of people) are some of the main factors contributing to productivity gains. Within the framework of the Europe 2020 strategy fostering an innovative and knowledge-based society is seen as a major route towards increasing labour productivity. Labour productivity per hour worked is a measure of real output (GDP deflated) generated per unit of labour (measured by the total number of hours worked). It shows the efficiency with which inputs are turned into goods and services.

([35]) European Commission, *European Economic Forecast*, Spring 2013, p. 25.

Research and development expenditure

About a 9 % increase in R&D intensity in the EU between 2000 and 2011. Although R&D spending stabilised at about 2 % of GDP during the economic downturn, further progress is needed to remain on-track to meet the 2020 target of 3 % of GDP

Figure 1.8: Total R&D expenditure, EU-27
(% of GDP)



NB: Data 1995–2002 and 2008–2011 are estimates.

Source: Eurostat (online data code: tsdec320)

Over the period 2000 to 2007 R&D expenditure as a share of GDP ('R&D intensity) was relatively stable in the EU, ranging between 1.82 % and 1.87 %. This development was not in line with meeting the EU SDS target of raising investment in R&D to 3 % of GDP by 2010. Despite the slowdown in economic activity after the crisis, R&D intensity in the EU recorded a slight increase of about 4.2 % and 4.7 % in 2008 and 2009 respectively (compared to the previous year). However, since 2009 it has come to a standstill.

Box 1.2: How does the EU foster R&D expenditure?

Within the framework of the Europe 2020 strategy and its 'Innovation Union' flagship initiative the EU aims to improve framework conditions and access to finance for research and innovation to help turn ideas into products and services that create growth and jobs. To this end, raising combined public and private investment levels in the R&D sector to 3 % of GDP has been formulated as one of the five headline targets of the Europe 2020 strategy.

Increasing public sector R&D investment to stimulate the economy

With the onset of the financial and economic crisis, R&D intensity increased to slightly over 2 % in 2009 as GDP fell more rapidly than overall R&D expenditure ([36]), and has remained at that level since. Besides the faster fall in GDP, the actions taken by individual EU Member States to step up public R&D investment drove this increase. In 2008, to counteract the impact of the economic crisis, many EU Member States boosted public R&D expenditure to stimulate economic growth and facilitate private R&D investment ([37]). Government sector R&D expenditure in the EU grew by 2.9 % from 2008 to 2009, outpacing

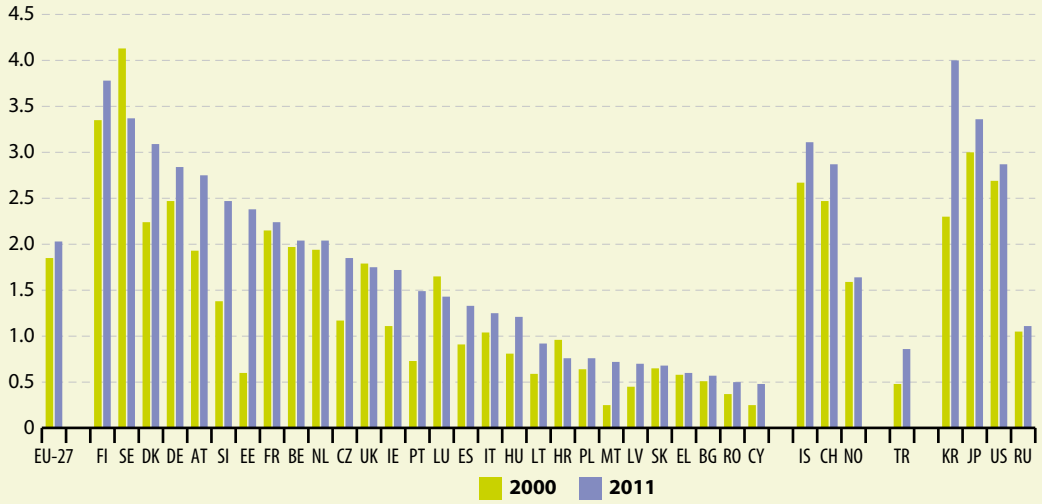
([36]) European Commission, 2011, *Innovation Union Competitiveness Report 2011*, Belgium, 2011 (p.64)
([37]) Ibid. p.65

growth in many other sectors except higher education. Business expenditure on R&D declined by 3.5 % over the same period, due to the economic crisis, although there was a much bigger effect on companies' net sales and profits ([38]).

Post-crisis boost in R&D expenditure of businesses

Contrary to an expected long-term decline in business R&D expenditure following the start of the crisis, spending in the business sector actually started to increase again with growth rates of 4.2 % in 2010 and 4.9 % in 2011. Similarly, increases in R&D expenditure over this period were also observed in the government and the higher education sectors.

Figure 1.9: Total R&D expenditure, by country
(% of GDP)



NB: 2001 data (instead of 2000) for EL, SE and NO, 2002 data (instead of 2000) for HR and MT, 2007 data (instead of 2011) for EL, 2008 data (instead of 2011) for CH, 2009 data (instead of 2011) for IS, JP and US, 2010 data (instead of 2011) for KR and RU; 2000 data are estimates for EU-27, AT, PT and IS; 2011 data are estimates or provisional for EU-27, BE, BG, DK, DE, EE, IE, IT, CY, LV, LT, LU, MT, NL, AT, PT, SI, SE, UK and NO; break in series for DK (2007), FR (2004 and 2010), HU and MT (2004), NL (2011), PT (2008), SI (2008 and 2011), SE (2005 and 2011), JP (2008) and KR (2007); definition differs for HU (2000), SE (2001), US (2000–2009), KR (2000)

Source: Eurostat (online data code: tsdec320)

How R&D expenditure varies between Member States

In 2011, R&D expenditure as a share of national GDP varied between 0.5 % and 3.8 %. Scandinavian countries, including Finland, Sweden and Denmark, had expenditure patterns more than one percentage point higher than the EU average. Out of this group of countries, however, only Denmark managed to reach its ambitious national R&D target under the Europe 2020 framework. Countries in Eastern and Southern Europe continued to lag behind, recording R&D expenditure levels between 1.85 % and 0.48 %. Many Member States recorded a substantial increase in R&D intensity after the economic crisis. This was not only a result of the slowdown in GDP growth, but also reflected government efforts to support economic recovery and long-term growth by boosting public and private funding for R&D.

([38]) The results are based on a study comprising the world's top 1 400 companies ranked by their investment in R&D and included in the 'EU industrial and investment scoreboard'. Data is drawn from the fiscal year 2009.

EU trends in R&D expenditure compared with other countries in the world

Despite there being some way to go to meet the 3 % target set out in the Europe 2020 strategy, the EU in 2011 was among the top five in the world ([39]). Israel was at the forefront concerning R&D expenditure (4.4 % of GDP), followed by the Republic of Korea (3.7 %) and Japan (3.3 %) ([40]). Although the United States was also hard hit by the financial and economic crisis, the country continued to provide more funding for R&D (2.8 %) than the EU. However, R&D expenditure of the EU exceeded that of Canada (1.7 %), Russia (1.1 %) and a number of emerging economies such as China (1.8 %) and Brazil (1.2 %) ([41]).

What lies beneath this indicator?

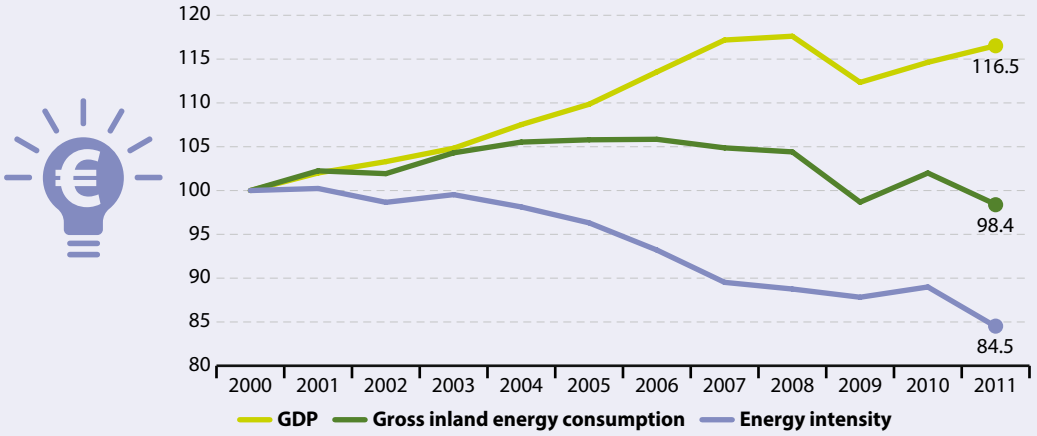
R&D contributes to a well-functioning economy by fostering knowledge and know-how which translate into new ideas for products, procedures and services. An innovative economy helps companies grow and maintain their competitive advantage in the market, resulting in economic growth and more jobs. The EU population's well-being also depends on scientific and technical solutions to global societal challenges such as climate change and population ageing. The indicator measures gross domestic expenditure on research and development (GERD) as a proportion of GDP. GERD includes R&D expenditure within higher education, government, business enterprise and private non-profit organisations.

([39]) Data available at http://data.un.org/Data.aspx?q=Research+and+development+expenditure&d=UNESCO&f=series%3aST_SCGERDGDP.
([40]) 2010 data.
([41]) 2010 data.

Energy intensity

15.5 % drop in energy intensity in the EU between 2000 and 2011. The overall declining trend indicates absolute decoupling of energy consumption from economic growth

Figure 1.10: Energy intensity of the economy, EU-27
(index 2000=100)



Source: Eurostat (online data codes: tsdec360, tsdcc320 and nama_gdp_k)

Energy intensity — the energy used to produce one unit of economic output — has declined substantially over the past decade. Between 2000 and 2011 energy consumption in the EU fell by 1.6 %, whereas GDP grew by 16.5 %. As a result, energy intensity recorded a drop of 15.5 % over this period, indicating absolute decoupling of energy consumption from economic growth.

Decoupling energy consumption from economic growth is essential for reconciling economic and environmental goals. A lowering of energy intensity can be observed both in the presence of absolute decoupling (energy consumption falls despite economic growth) and relative decoupling (energy consumption grows at a slower pace than economic growth).

Energy intensity remains responsive to swings in the economic cycles

Changes in energy intensity tend to closely follow the economic cycle. Between 2001 and 2009 (with the exception of 2003) energy intensity fell more or less steadily. This was because GDP grew at a slower rate than gross inland energy consumption during the economic downturn. The rebound in economic growth in the EU in 2010 (+ 2.0 % compared with 2009) was accompanied by a surge in energy consumption (+ 3.4 % compared with 2009). As a result, energy intensity in the EU increased for the first time since 2003, by 1.3 % from 2009 to 2010. However, due to the rapid reduction in energy consumption during the next year while GDP continued to grow, energy intensity in the EU recorded a substantial drop of 5.1 %.

The 15.5 % reduction in energy intensity over the past decade has been influenced by improvements in energy efficiency (both in terms of final consumption and power generation) and a shift to renewables in the power generation mix. The increase in eco-efficiency, which is reflected in reduced energy intensity, has also resulted from structural economic changes within the EU. These include the transition towards a more service-based economy and less energy-intensive and higher value-added industries ([42]).

Decoupling indicators *show the interdependence between two spheres. Decoupling is calculated by dividing an environmental pressure variable by an economic driver variable.*

Absolute decoupling *means environmental pressure is stable or decreasing while the economic driving force is growing. Thus it is the genuine separation of environmental pressures from economic growth.*

Relative decoupling *occurs when the driving force grows faster than the environmental pressure.*

([42]) European Environmental Agency, *Total primary energy intensity* (CSI 028/ENER 017), 2012.

Box 1.3: How does the EU foster eco-efficiency?

Although no quantified target for energy intensity has been adopted, eco-efficiency is strongly promoted within the Europe 2020 Strategy. Two of the strategy's objectives, also translated into headline targets, are improving energy efficiency by 20 % and increasing the share of renewables in final energy consumption in the EU to 20 % by 2020.

On 25 October 2012, the EU adopted Directive 2012/27/EU on energy efficiency ([43]). This establishes a common framework of measures for the promotion of energy efficiency within the Union to ensure the achievement of the EU's 2020 headline target on energy efficiency and to pave the way for further energy efficiency improvements beyond that date.

What lies beneath this indicator?

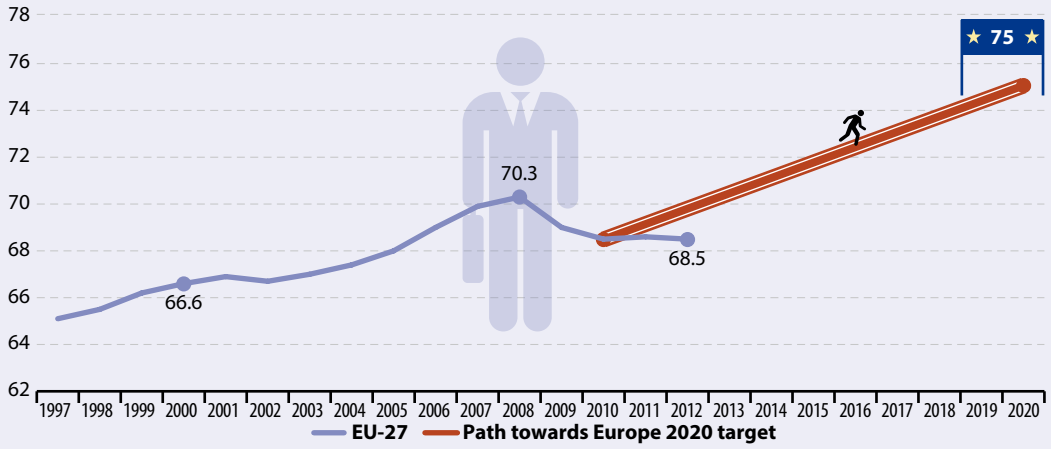
The indicator on total energy consumption provides an insight into the extent to which the EU economy has managed to decouple energy consumption and economic growth. But as well as energy intensity, eco-efficiency should be monitored alongside other environmental indicators such as CO_2 emissions or the share of renewables in domestic energy production. This is because the overall environmental impacts of economic activity depend on the total amount of energy consumption and the mix of fuels and technologies used in energy production. Total energy intensity is measured as the ratio between the gross inland consumption of energy and GDP. Energy consumption encompasses the consumption of various fuel types including solid fuels, liquid fuels, gas, nuclear and renewables.

([43]) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:315:0001:0056:EN:PDF

Employment

1.9 percentage point increase in the EU employment rate between 2000 and 2012. As a result of the recent economic downturn the rate has slipped away from its 2020 target path

Figure 1.11: Total employment rate, EU-27
(% of age group 20–64 years)



Source: Eurostat (online data code: tsdec410)

***Aggregate demand** is the total amount of goods and services demanded in the economy at a given time and price level. It is the sum of consumption expenditure, investment expenditure, government expenditure and net exports.*

The share of EU citizens aged 20 to 64 in employment was increasing more or less steadily in the decade before the economic crisis (1997 to 2008), reaching a peak of 70.3 % in 2008. The indicator followed the economic cycle with its usual time lag as adjustments in the labour market took longer time to respond to changes in aggregate demand ([44]). In 2009, the economic crisis fully hit the European labour market, bringing the employment rate back to the 2006 level of 69 %. After recording a further drop of 0.5 percentage points in 2010, the employment indicator came to a standstill at 68.5 %, where it remained until 2012. From 2010 to 2011, the EU economy experienced jobless growth, where most GDP growth was driven by increases in productivity and hours worked rather than employment ([45]). As a result of this labour market stagnation, the EU has deviated from its path towards the Europe 2020 employment target of 75 %.

Box 1.4: How does the EU foster employment?

Within the framework of the Europe 2020 strategy, the EU adopted the headline target of raising the employment rate for women and men aged 20 to 64 to 75 %. This should include greater participation of young people, older workers and low-skilled workers and better integration of legal migrants. This goal is supported by the employment package, which aims to create more and better jobs throughout the EU.

The strategy's employment priority theme is further supported through several flagship initiatives. 'Youth on the Move' aims to improve the performance of EU education systems and help integrate young people into the labour market.

The EU employment package 'Towards a Job Rich Recovery' also adopts investment in skills as one of its main priorities. In an attempt to improve the dynamism of the European economy, it calls for better monitoring of skills and needs and 'close cooperation between the worlds of education and work'.

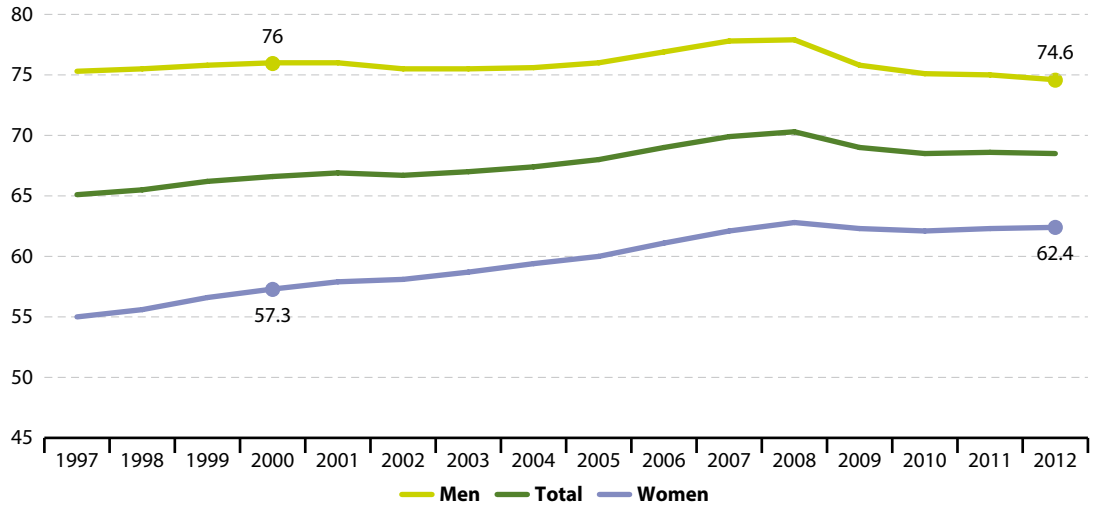
'An Agenda for New Skills and Jobs' puts forward reforms aimed at improving flexibility and security in the labour market, increasing the match between skill supply and labour market needs, and enhancing job quality and working conditions.

([44]) European Commission, *Employment and Social Developments in Europe*, 2012, p. 67.
([45]) Ibid. p. 19.

The gender employment gap is shrinking

Economic activity of the working age population tends to vary according to gender and education. Although the gender employment gap in the EU has reduced substantially over the past decade, women are still less economically active than men. Variations in regional employment among women exceed those of men fivefold. A number of factors contribute to this trend, the most important of which is the time women spend on childcare and other family responsibilities, especially in countries where childcare services are unaffordable or absent. Furthermore, the longer women are out of the labour market or remain unemployed due to care duties, the harder it will be for them to find a job in the long term. This is also reflected in the widening gender employment gap for older cohorts ([46]). Nevertheless, between 2000 and 2012 the gender gap in regional dispersion of employment has reduced almost by half, indicating that women have gained a more stable position in regional economies. The gap between female and male employment rates reduced during the economic crisis, which affected men more than women. This could partly be explained by the fact that industries such as construction and cars, which tend to be male dominated, were hit first and hit hardest by the crisis ([47]).

Figure 1.12: Employment rate, by gender, EU-27
(% of age group 20–64 years)



Source: Eurostat (online data code: tsdec420)

Box 1.5: Employment policies specifically targeting the situation of women

One of the priorities of the flagship initiative 'An Agenda for New Skills and Jobs' is to create new momentum for flexicurity policies aimed at modernising labour markets and promoting work through new forms of flexibility and security. Under the first flexicurity component, 'flexible and reliable contractual arrangements', the initiative calls for 'putting greater weight on internal flexibility in times of economic downturn. [. . .] Flexibility also allows men and women to combine work and care commitments, enhancing in particular the contribution of women to the formal economy and to growth, through paid work outside the home' ([48]).

([46]) Eurostat, *Smarter, greener, more inclusive? — Indicators to support the Europe 2020 strategy*, Luxembourg, Publications Office of the European Union, 2013, p. 39.
([47]) European Commission, Directorate-General for Economic and Financial Affairs, *Economic Crisis in Europe: Causes, Consequences and Responses*, 2009, p. 36
([48]) European Commission, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM (2010) 682 final, Strasbourg, 2010 (p. 5).

Does better educational attainment increase employability?

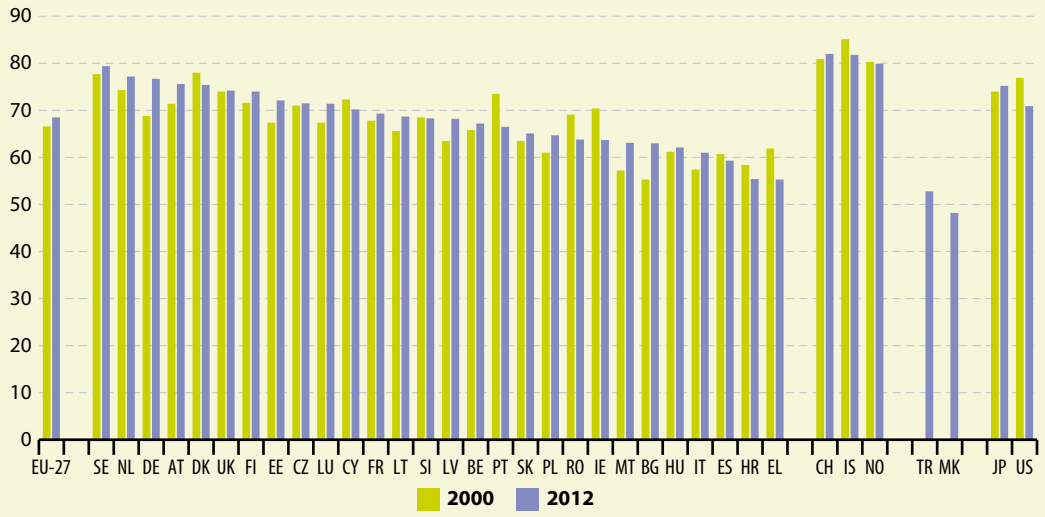
Educational attainment levels are an important factor for explaining the variation in activity and employment rates between different groups of the labour force. Employment rates are generally higher for people with better education levels. In 2012, people that had completed tertiary education had a significantly higher employment rate than the EU average, at 81.9 %. In contrast, just slightly more than half (52.2 %) of those with at most primary or lower secondary education were employed. The rate for workers with upper secondary or post-secondary non-tertiary education was in between these levels, at 69.7 %, slightly above the EU average.

Although the employment rates of different education subgroups have followed the same path over time, people with a lower education level were more vulnerable to job losses during the 2008 economic crisis. This is possibly due to the fact that sectors requiring lower qualification levels, such as the construction industry in Spain, the UK and Ireland, were hit hardest by the economic downturn. In recognition of the importance of educational attainment for job market performance, the EU has adopted headline targets and policy measures for both education and employment as part of the Europe 2020 strategy (see Box 1.4).

How employment rates vary between Member States

There is a substantial difference in employment rates across the EU. In 2012, Sweden, the Netherlands, Germany, Austria and Denmark exceeded the EU average employment target of 75 %. But at the same time, other countries were more than 15 percentage points behind the EU average target. The lowest end of the spectrum was dominated by countries in Southern and Eastern Europe, with Greece and Croatia having the lowest average employment rates at 55.3 % and 55.4 % respectively. These low rates are likely to reflect differences in economic development, demographic trends, labour market structures and policies between Member States, as well as the asymmetric impact of economic shocks.

Figure 1.13: Total employment rate, by country
(% of age group 20–64 years)



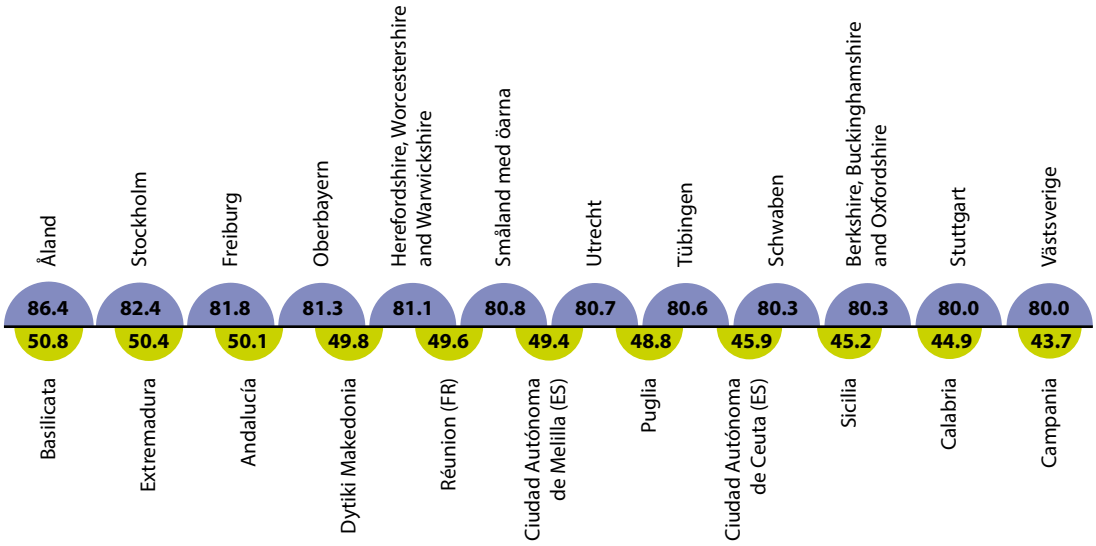
NB: 2002 data (instead of 2000) for HR, 2003 data (instead of 2000) for IS.

Source: Eurostat (online data code: tsdec410)

Employment in the EU regions

Between 2003 and 2007, gaps in regional employment rates across the EU steadily narrowed, assisted by favourable economic conditions. The reduction in regional disparities might have been driven by a number of factors including increased workforce mobility, less regional specialisation in particular sectors and diminishing regional differences in educational attainment and skills. However, differences in employment rates across regions started growing again following the 2008 economic crisis. In 2012 EU regional disparities in employment reached 2000 levels.

Figure 1.14: Employment rate, by NUTS 2 regions, 2012
(% of population aged 20–64)



Source: Eurostat (online data code: lfst_r_lfe2emprt)

What lies beneath this indicator?

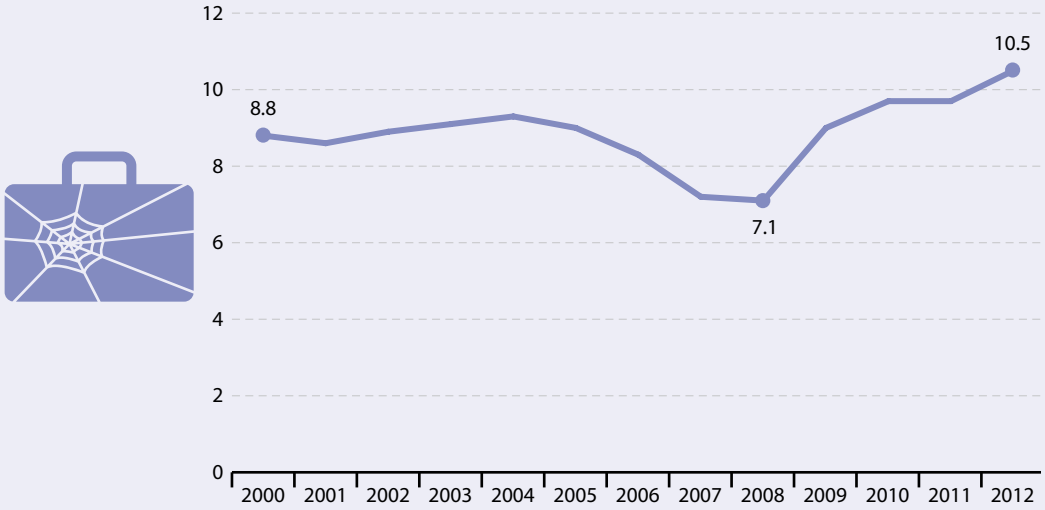
Employment represents an essential cornerstone of socioeconomic development by fostering economic prosperity, social inclusion and quality of life. Labour market participation is an important factor for human well-being because it gives people the space and resources needed to achieve life goals and aspirations, gives them a sense of purpose and allows them to engage meaningfully in society.

The employment rate is defined as the share of the population aged between 20 and 64 in employment.

Unemployment

1.7 percentage points increase in the unemployment rate between 2000 and 2012. More people aged 15 to 74 have become jobless since the onset of the financial crisis in 2007, with youth hit more severely

Figure 1.15: Total unemployment rate, EU-27
(%)



Source: Eurostat (online data code: tsdec450)

Between 2000 and 2002 the EU's unemployment rate was more or less stable at about 8.8 %. Joblessness increased over the next two years, following the economic cycle. Between 2005 and 2008 unemployment was on the decrease, reaching a decade low of 7.1 % in 2008. However, the trend was reversed in 2009 when the economic downturn resulted in a prolonged deterioration of the labour market.

Activation policies are designed to encourage unemployed to step up their job search after an initial spell of unemployment, by making receipt of benefit conditional on participation in programmes.

Unemployment in the EU hits a record high

The economic crisis that took hold of the European economy in 2008 first hit the labour market in 2009. This reflects the normal delay in the response of employment to GDP. Since then the unemployment rate has been steadily increasing, registering an all-time peak of 10.5 % in 2012 in line with the stark GDP contraction. Furthermore, job creation is expected to remain weak against a background of weak economic activity and sluggish recovery. As the economy adjusts to the pre-crisis misallocation and over-investment, further job restructuring is expected before labour markets rebound ([49]). Activation policies and promotion of re-training and lifelong learning programmes have the potential to facilitate labour market adjustments by addressing existing occupational and skill mismatches.

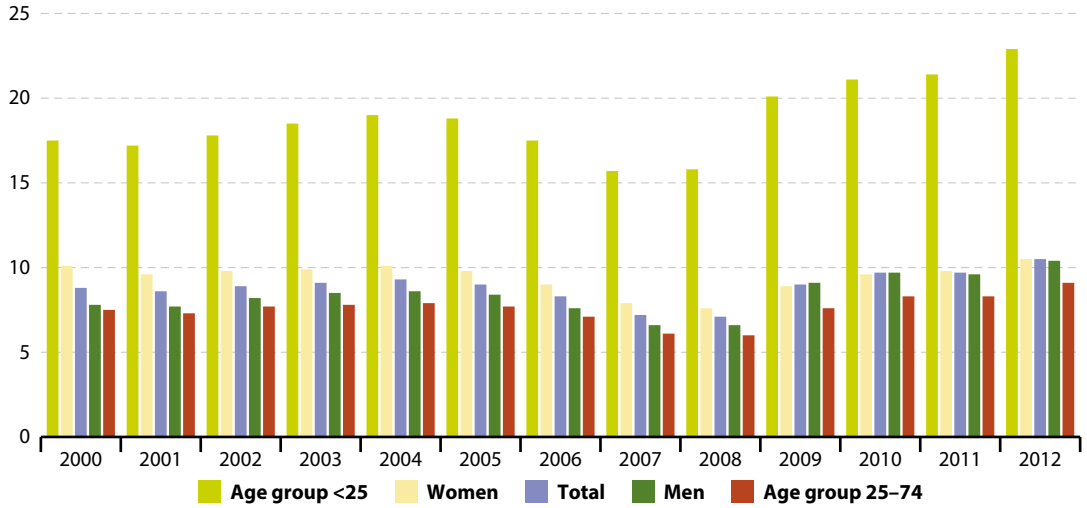
Young people and men were affected most by the labour market downturn

A closer look at the unemployment indicator shows that young people aged below 25 have been more strongly affected by labour market deterioration than other age groups. Since 2008, joblessness among the young has increased by seven percentage points, reaching 22.9 % in 2012. Long spells of unemployment are particularly harmful for young people because they lead to skill erosion and prevent them from building up work experience. This diminishes their labour market prospects from a very early stage. In light of these developments, young people are a high priority for policy action at the EU and national level (see Box 1.4).

([49]) ILO, *Global Employment Trends 2013: Recovering from a Second Jobs Dip*, Executive Summary, p. 3.

Since 2000, gaps in the unemployment rates of men and women have been closing up. In 2012, the gender unemployment gap was nearly non-existent, mainly as a result of the pronounced increase in male unemployment compared with a small increase in female unemployment during the economic downturn.

Figure 1.16: Unemployment rate, by gender and age group, EU-27
(%)



Source: Eurostat (online data codes: tsdec450 and tsdec460)

Box 1.6: Strengthening social integration within the Economic and Monetary Union

In October 2013 the European Commission proposed several measures for deepening the social integration of the EU ([50]). The Commission Communication focuses on three main areas:

- Reinforcing surveillance of employment and social challenges and strengthening policy coordination under the European Semester through the creation of a scoreboard, which allows better and earlier identification of employment and social problems. Indicators in the scoreboard would include: the unemployment level and the way it evolves; NEET rate (young people not in education, employment or training) and youth unemployment rate; the real gross disposable income of households; the at-risk-of-poverty rate of the working age population; inequalities (the S80/S20 ratio). The data should feed into policy through the country specific recommendations or by integrating a limited number of employment and social indicators into the annual Alert Mechanism Report (AMR).
- Enhancing solidarity and reinforcing job mobility by reducing costs and removing barriers to moving for work across the EU.
- Strengthening the social dialogue at EU and national level by better involving social partners such as trade unions and employers at key steps of decision-making processes under the European Semester.

([50]) European Commission, *The Future of the Economic and Monetary Union: Commission proposes ideas to deepen social integration*, IP/13/893,Brussels 02/10/2013.

How unemployment rates vary between Member States

There is a very large difference in the labour market performance of Member States, with the unemployment rate across the EU varying by more than 20 percentage points. In 2012, the countries with the highest unemployment rate were Spain (25.0 %), Greece (24.3 %), Portugal (15.9 %), Croatia (15.9 %) and Ireland (14.7 %). On the other side of the spectrum were Austria, Luxembourg, Netherlands and Germany, with rates between 4.3 % and 5.5 %.

EU trends in unemployment compared with other countries in the world

In 2012 the EU unemployment rate of 10.5 % significantly exceeded the average for the OECD (8 %), G-7 ([51]) (7.4 %) and the United States (8.1 %). Joblessness in the EU was also more than twice as high as in Japan (4.4 %) and Australia (5.2 %) ([52]). However, due to the significant spillover effects of the weak growth in advanced economies — Europe in particular — most international labour markets did not stay immune to the economic downturn. According to the International Labour Organization, 20 % of the increase in unemployment in 2012 occurred in advanced economies, whereas the other 80 % was in developing countries. The most pronounced effects were in East Asia, South Asia and Sub-Saharan Africa ([53]).

What lies beneath this indicator?

Paid employment contributes to individual well-being by providing the resources needed for decent living standards and the pursuit of personal goals and aspirations. High unemployment rates, on the other hand, can endanger social cohesion and increase the risk of poverty and social exclusion. Spells of prolonged unemployment among young people, in particular, can have adverse consequences for their future career development as well as for the economy as a whole.

The unemployment rate measures the number of unemployed people as a percentage of the labour force. The labour force consists of all employed and unemployed persons in the 15 to 74 age group. Unemployed persons comprise persons aged 15 to 74 who were (1) without work during the reference week, (2) available to start work, (3) actively seeking work (had taken specific steps in the four-week period ending with the reference week to seek paid employment or self-employment or who found a job to start later, within a period of at most three months).

([51]) G-7 is a group of seven industrialised nations in the world formed by the United States, the United Kingdom, France, Germany, Italy, Canada and Japan.
([52]) OECD data on harmonised unemployment rate. Available online at: http://stats.oecd.org/index.aspx?r=32996
([53]) ILO, *Global Employment Trends 2013: Recovering from a Second Jobs Dip*, Executive Summary, p. 1.

Sustainable consumption and production

2

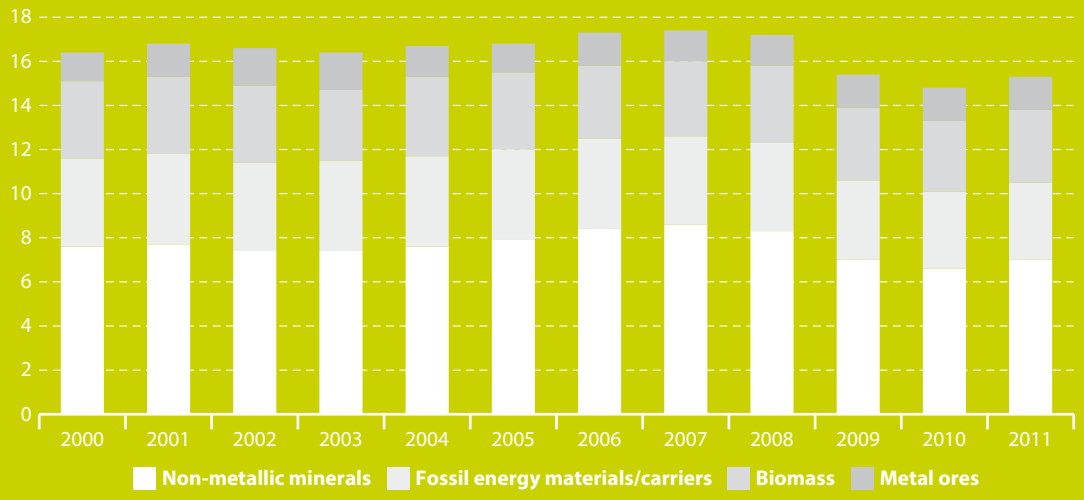
Sustainable consumption and production seen through the lens of Green Economy

Measuring 'true' resource use

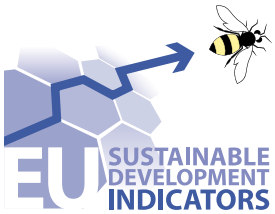
Raw Material Consumption (RMC) provides the most accurate picture on resource use because it 'corrects' imports and exports of products with the equivalent amount of domestic extraction of raw materials that were needed to manufacture the respective traded good.

In 2011, each EU inhabitant consumed an average of 15.3 tonnes of raw materials. Non-metallic minerals accounted for 46 %, fossil energy resources for 23 %, biomass for 22 %, and metal ores for 10 %. There has been a significant drop in raw material consumption since the onset of the economic crisis due to fewer construction activities, leading to a fall in the use of non-metallic minerals (sand and gravel).

Raw Material Consumption (RMC), by main material categories, EU
(tonnes per capita)



Source: Eurostat



Overview of main changes

Many of the sustainable consumption and production theme's indicators are strongly linked to economic activity. Because of this, any interpretation of them should take into account the turbulence caused by the economic and financial crisis. Its temporary effect may explain many recent improvements rather than an actual shift towards more sustainable consumption and production patterns. This is particularly so for resource productivity and material use, where data suggest an absolute decoupling of resource consumption from economic growth. The situation is similar for final energy consumption and, to a lesser extent, electricity consumption. However, some long-term improvements can be seen in waste treatment, pollutant emissions and in environment-friendly production patterns.

Table 2.1: Evaluation of changes in the sustainable consumption and production theme (EU-27, from 2000) (1)

Level 1	Level 2	Level 3
	Resource use and waste	
Resource productivity		Domestic material consumption
		Recycled and composted municipal waste
		Atmospheric emissions
	Consumption patterns	
	Electricity consumption of households	Final energy consumption
	Production patterns	
	Environmental management systems (*)	Organic farming (**)

(*) From 2003 (**) From 2005

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.

Sustainable consumption and production seen through the lens of Quality of Life

Despite emissions falling, air pollution is still affecting European city dwellers

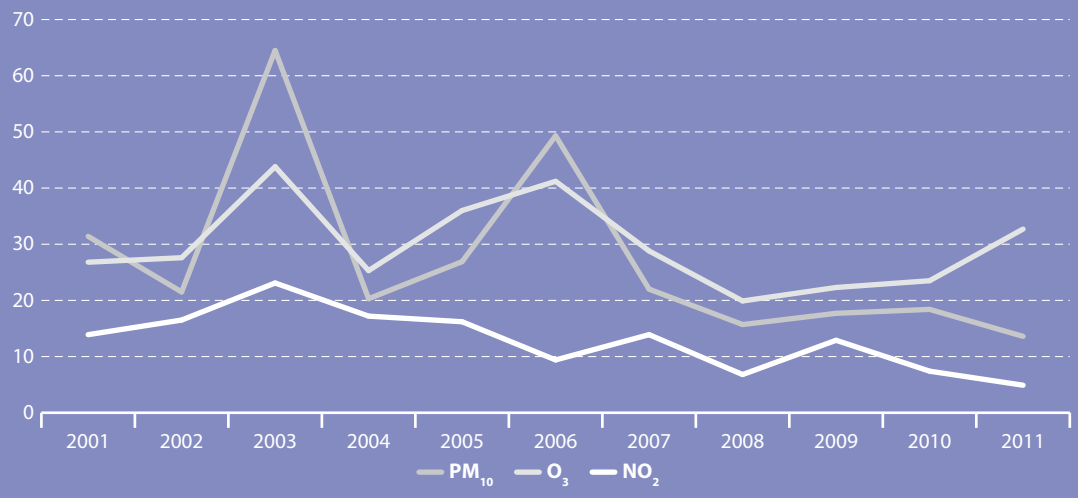
Air pollution damages human health (from minor respiratory irritation to cardiovascular diseases and premature death) and the environment, thus strongly affecting quality of life in the EU. Despite significant cuts in emissions of air pollutants over the past decades, particulate matter (PM), ozone (O_3) and reactive nitrogen substances still pose a significant threat. Urban areas, hosting the majority of the European population, have been affected most strongly by poor air quality.

In 2011 about 33 % of the urban population in the EU was exposed to PM_{10} above the daily limit value ([1]). Between 2001 and 2011 the extent of exposure above the limit value varied between 20 % and 44 % without any apparent trend over this period.

Exposure to above-limit O3 levels ([2]) was slightly lower in 2011, at about 14 %. However, the trend since 2001 has been much more volatile, with peaks of almost 65 % in 2003 and 50 % in 2006. It is important to note that O_3 concentrations are not only determined by precursor emissions but also by meteorological conditions; episodes of elevated O_3 levels occur during periods of warm, sunny weather.

About 5 % of the urban population in the EU was exposed to NO_2 above the EU annual limit value ([3]) in 2011. Between 2001 and 2011 NO_2 exposure showed a decreasing trend.

Urban population residents living in areas where pollutant concentrations are higher than selected limit/target values, EU-27
(% of urban population)



Source: European Environment Agency

([1]) Limit value for PM_{10}: 50 micrograms/m^3 (24 hour average, i.e. daily), not to be exceeded more than 35 times a calendar year.
([2]) Target value for ozone: 120 micrograms of O_3/m^3 as daily maximum of 8 hour mean, not to be exceeded more than 25 days per calendar year, averaged over three years.
([3]) Annual mean limit value for nitrogen dioxide: 40 micrograms of NO_2/m^3.

Why do we deal with sustainable consumption and production?

Production and consumption of goods and services contributes to human well-being by satisfying physical and other needs such as food or shelter. However, current patterns of consumption and production also harm the natural environment and human well-being. In particular they deplete the Earth's natural resources and damage ecosystems. Making consumption and production more sustainable means responding to basic needs and improving quality of life while, at the same time, using fewer natural resources such as raw materials, energy, land and water. This includes reducing or eliminating waste and pollutants or lowering overall consumption through better management systems, improved product and service design, best available technologies and supporting sustainable lifestyles. In doing so, more environment-friendly agricultural practices and environmental management schemes can boost biodiversity, landscape preservation and water and soil quality.

All these aspects of the sustainable consumption and production theme are closely interlinked. Material flows influence the amount of waste and emissions produced, which can affect the well-being of people and the environment. Air pollutants from industry, transport and agriculture damage health and contribute to acidification, eutrophication and physical damage of materials. Certain air pollutants (ozone) reduce plant growth which is ultimately linked to an ecosystem's health and performance. At the other end of the chain waste levels are also influenced by waste treatment. Increasing waste recovery by recycling and composting reduces demand for raw materials and resource extraction. Linkages also exist between increases in consumption and production patterns and negative environmental and public health impacts. Inappropriate waste treatment can cause environmental pollution and expose humans to harmful substances and disease-causing organisms, damaging their health. An ever-growing material consumption leading to higher imports and exports is also associated with more freight transport. As a result, increasing transport volumes lead to higher energy consumption and emissions of pollutants (including particulate matter and ozone precursors) and greenhouse gases.

How does the EU tackle sustainable consumption and production?

The EU Sustainable Development Strategy (EU EDS) dedicates one of its seven key challenges to sustainable consumption and production, with the overall objective of 'promoting sustainable consumption and production patterns'.

The EU SDS operational objectives and targets:

- Promoting sustainable consumption and production by addressing social and economic development within the carrying capacity of ecosystems and decoupling economic growth from environmental degradation.
- Improving the environmental and social performance of products and processes and encouraging their uptake by business and consumers.
- Aiming to achieve by 2010 an EU average level of green public procurement (GPP) equal to that currently achieved by the best performing Member States.
- The EU should seek to increase its global market share in the field of environmental technologies and eco-innovations.

The Europe 2020 Strategy unites two flagship initiatives under the sustainable growth priority to tackle the issue of sustainable consumption and production:

- 'Resource efficient Europe' helps decouple economic growth from the use of resources, supports the shift towards a low carbon economy, increases the use of renewable energy sources, modernises our transport sector and promotes energy efficiency. The Roadmap to a resource efficient Europe is one of the main building blocks of the resource efficiency flagship initiative.
- 'An industrial policy for the globalisation era' improves the business environment, notably for SMEs and supports the development of a strong and sustainable industrial base able to compete globally.
- In 2008 the European Commission presented the Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan. It includes proposals on sustainable consumption and production that will contribute to improving the environmental performance of products and increase the demand for more sustainable goods and production technologies.

Further reading on sustainable consumption and production

EEA, *Environmental pressures from European consumption and production*, Copenhagen: European Environment Agency, 2013.

EEA, *The European environment — state and outlook 2010: Consumption and the environment — 2012 update*, Copenhagen: European Environment Agency, 2012.

EEA, *The European environment — state and outlook 2010*, Copenhagen: European Environment Agency, 2010.

ETC/SCP, *Analysis of latest outcomes of academic work on sustainable consumption 2010–2012*, ETC/SCP Working Paper No 3/2013.

UNDESA, *Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective*, United Nations: New York, 2011.

UNDESA, *Trends Reports: Trends in Sustainable Development — Towards Sustainable Consumption and Production 2010–2011*, United Nations: New York, 2010.

Website on European Sustainable Consumption and Production Policies, DG Environment at http://ec.europa.eu/environment/eussd/escp_en.htm

Website on the UN Marrakech Process, United Nations: DESA/DSD and UNEP at http://esa.un.org/marrakechprocess/

Website on the UN 10-year framework of programmes on sustainable consumption and production patterns, United Nations at http://sustainabledevelopment.un.org/index.php?menu=204

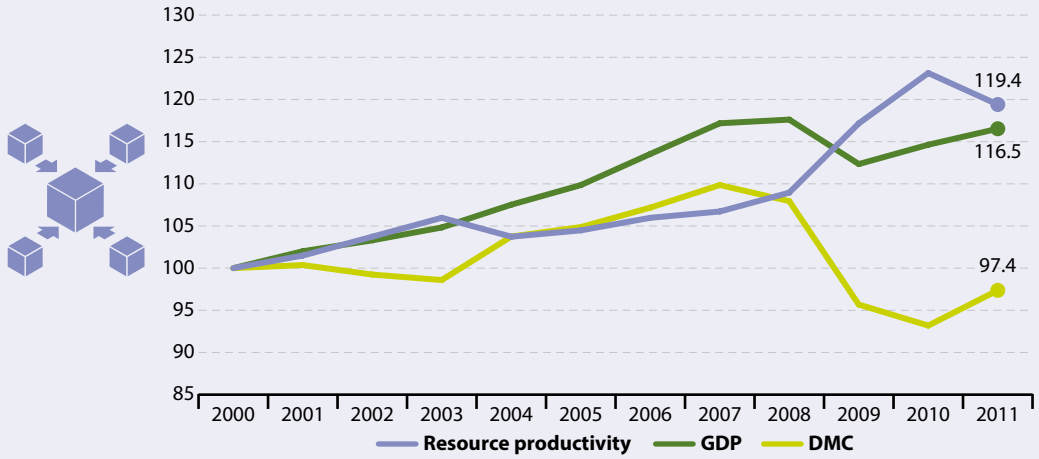
Website on EMAS — Eco-Management and Audit Scheme, DG Environment at http://ec.europa.eu/environment/emas/

Website of the European Topic Centre on Sustainable Consumption and Production (ETC/SCP) at http://scp.eionet.europa.eu/

Resource productivity

An almost 20 % increase in resource productivity in the EU between 2000 and 2011. This trend was mainly driven by a fall in the consumption of non-metallic materials by the construction sector

Figure 2.1: Resource productivity, EU-27
(index 2000 = 100)



NB: Data for resource productivity and domestic material consumption are estimates.

Source: Eurostat (online data codes: tsdpc100, tsdpc230 and nama_gdp_k)

Resource productivity in the EU rose almost continuously between 2000 and 2011 by about 20 %, from 1.34 EUR per kilogram to 1.60 EUR per kg. The only exceptions to this trend occurred in 2004 (2.1 % decline) and 2011 (3.0 % decline).

A rise in resource productivity means a decoupling of economic growth from resource use and environmental degradation. In the pre-crisis period between 2000 and 2007 decoupling was only relative, as domestic material consumption (DMC) continued increasing at half the rate of GDP growth.

Has the EU achieved absolute decoupling during the past decade?

Overall, between 2000 and 2011 resource productivity grew faster than the economy, by 19.4 % compared with a 16.5 % growth in GDP. This indicates absolute decoupling of material consumption from economic growth. However, this trend was mainly influenced by a decrease in the consumption of non-metallic materials by the construction sector (for more details see the indicator domestic material consumption).

The strongest period of EU resource productivity growth appears to have been in the years following the economic crisis of late 2008. It increased by 7.5 % in 2009 and 5.1 % in 2010. This was largely driven by a significant drop in DMC, by about 16 % from 2008 to 2010, which outstripped the fall of GDP during the economic downturn. However, in 2011 the trend reversed when most European economies recovered from the financial crisis and material consumption increased substantially.

Factors influencing 'real' resource productivity

The above observations need to take into consideration the effect of the economic recession. It is likely that the fall in DMC in 2009 and 2010 was influenced by the economic slowdown in the previous two years ([2]) rather than by efficiency gains in the economic production system.

([2]) European Commission, DG Eurostat — *Update of Analysis of DMC Accounts: Environmental Data Centres on Natural Resources and Products, 2012*, p. 29.

Resource productivity *monitors the amount of gross value added (measured as GDP) that an economy generates by using one unit of material (measured as domestic material consumption).*

Decoupling indicators *show the interdependence between two spheres. Decoupling is calculated by dividing an environmental pressure variable by an economic driver variable.*

Absolute decoupling *means environmental pressure is stable or decreasing while the economic driving force is growing. Thus it is the genuine separation of environmental pressures from economic growth.*

Relative decoupling *occurs when the driving force grows faster than the environmental pressure.*

***Upstream hidden flows** comprise imports and exports of materials embodied in products.*

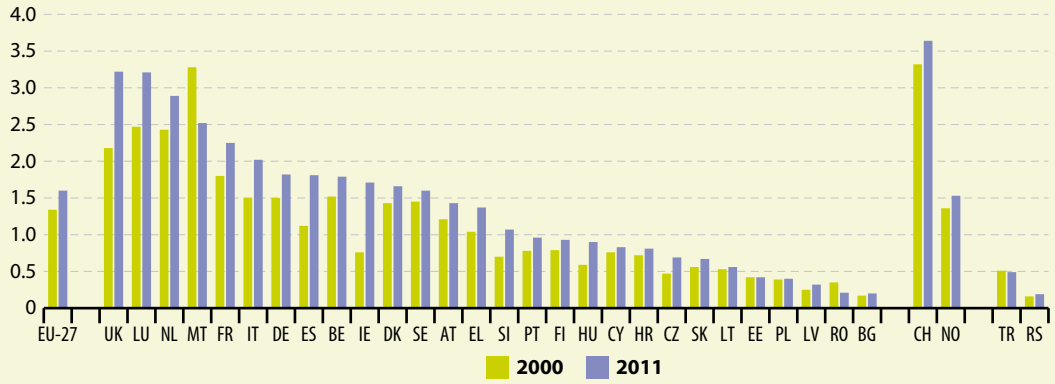
Furthermore, the raw materials embodied in the growing amount of imports of intermediate and final goods from the rest of the world need to be taken into account ([3]). Because DMC does not account for upstream material flows the progress in decoupling might be somewhat overestimated.

The EU has shown continuous growth in the amount of material extraction and primary production that it outsources to other countries ([4]). So while direct material resource use in Europe seems to have stabilised, at the global level an EU citizen's material 'footprint' is likely to be much more substantial.

How resource productivity varies between Member States

The large variations among Member States regarding resource productivity are the result of a combination of factors such as sectoral composition and national economic structure (strong service and knowledge-based/technology as opposed to primary sector industry or raw material processing), specific resource endowments, degree of outsourcing of production, existence of resource policies encouraging recycling and re-use of resources and others ([5]).

Figure 2.2: Resource productivity, by country
(EUR per kg)



NB: EU-27 data are estimates; 2001 data (instead of 2000) for HR and RS; 2008 data (instead of 2011) for NO; 2010 data (instead of 2011) for CH, TR and RS.

Source: Eurostat (online data code: tsdpc100)

In general, the old Member States tend to show relatively high resource productivity levels. Only Finland was lagging behind with 0.93 EU per kg in 2011. This can be partially attributed to its relatively high DMC per capita ([6]). Luxembourg and the United Kingdom took the lead by using resources two times more efficiently than the EU average.

The biggest resource productivity increases since 2000 have been observed in Ireland, Spain, Hungary and Slovenia. Most of the new EU Member States, where resource productivity has remained at relatively low levels (except Malta), show a significant potential for improvement.

EU trends in resource productivity compared with other countries in the world

Since 2000, many of the larger EU Members States have ranked highest among most of the G20 countries in terms of material productivity ([7]). For example, in 2008 the United Kingdom, Germany and Italy had material productivity rates of 3.1 (IT and DE) and 4.3 (UK) US $ per kg of non-energy material, surpassing the performance of all other G20 members except Japan with about 4.3 US $ per kg ([8]).

([3]) European Environment Agency, *Environmental Indicator Report 2012*, p. 101.
([4]) European Commission, DG Eurostat — *Update of Analysis of DMC Accounts: Environmental Data Centres on Natural Resources and Products*, 2012, p. 29.
([5]) SERI — *Green Economies around the World? — Implications for Resource Use for Development and the Environment*, 2012, p. 50.
([6]) European Commission, DG Eurostat — *Update of Analysis of DMC Accounts: Environmental Data Centres on Natural Resources and Products*, 2012, p. 27.
([7]) The Group of Twenty (G20) is the premier forum for international cooperation on the most important issues of the global economic and financial agenda.
([8]) OECD data on non-energy material productivity (US $ / kg), extracted 09.07.2013.

What lies beneath this indicator?

Economic growth has usually been associated with increased material and energy use. These are drivers for environmental degradation and impacts on human health. Therefore, the indicator resource productivity is calculated by dividing GDP (deflated) by domestic material consumption (DMC) to monitor these constraints on economic growth. The indicator is an aggregate measure of an economy's material efficiency. It provides insights into whether decoupling between natural resource use and economic growth is taking place. In particular, the development and deployment of eco-innovative processes and products play an important role in increasing resource efficiency.

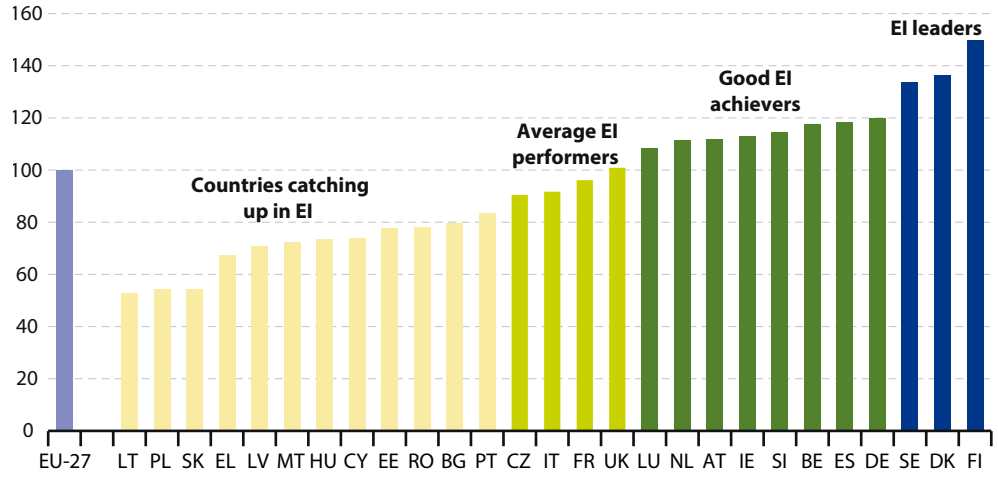
Box 2.1: Eco-innovation — boosting the green economy and delivering green jobs

Generally, the concept of eco-innovation comprises any innovation that reduces the use of natural resources and decreases emissions of harmful substances. Besides its environmental and health benefits, eco-innovation means bringing new products to the market, therefore increasing economic productivity and job creation ([9]). As a consequence the European Commission initiated a series of 'innovation partnerships' under the umbrella of the flagship initiative 'Innovation Union' particularly targeting the development and deployment of technologies addressing environmental and socioeconomic challenges.

In this regard the Eco-innovation Scoreboard is a set of indicators assessing eco-innovation performance across the EU. The indicators are ranging from 'eco-innovation push' indicators (such as research and development investments) to aggregated output indicators (like eco-patents) and outcomes (socio-economic and environmental performance) ([10]).

Overall, Member States have been clustered into four groups, according to their overall eco-innovation performance (as shown in the figure below): countries catching up, average performers, good achievers and leaders in eco-innovation. As in 2011, Denmark, Sweden and Finland are the best performing countries in the EU and thus form the group of 'Eco-Innovation Leaders'. EU Member States scoring rather low but catching up quickly were Bulgaria and Romania due to substantial improvements in eco-innovation outputs (eco-innovation related media coverage) and eco-innovation activities (ISO 14001 registered organisations). Countries who experienced a downward trend were Latvia, Malta and Hungary. This trend occurred mainly on the backdrop of decreasing eco-innovation inputs (government R&D appropriations and outlays) and environmental outcomes (for example water and energy productivity).

Figure 2.3: Structure and indicators of the Eco-Innovation Scoreboard, 2012
(index EU-27 = 100)



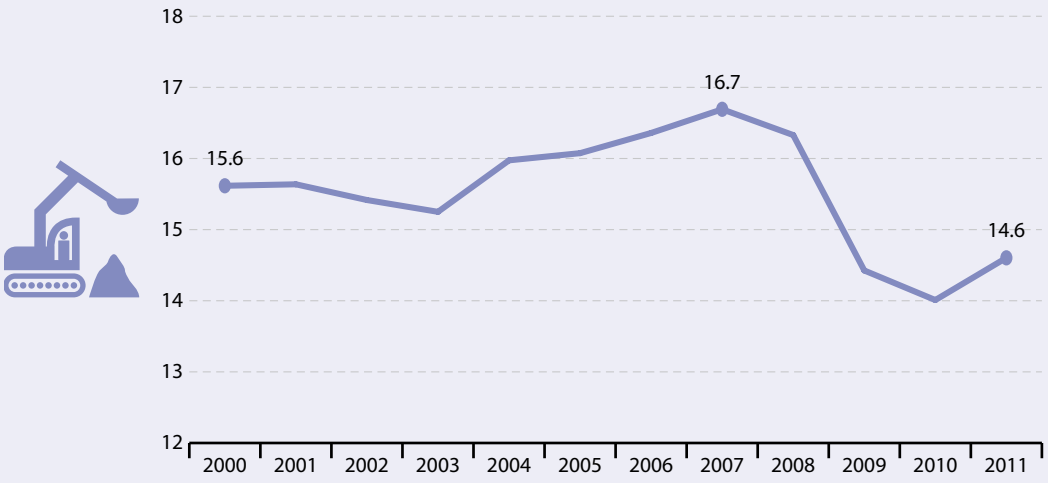
Source: Eco-Innovation Observatory

([9]) Eco-innovation Observatory, 2011. Eco-Innovation Brief #1: Introducing eco-innovation: from incremental changes to systemic transformations.
([10]) Eco-innovation Observatory, 2011. Eco-Innovation Brief #3: The Eco-Innovation Scoreboard at a glance.

Domestic material consumption

One tonne less material consumed per EU inhabitant in 2011 compared to 2000. The crisis stopped the growth in material consumption, but economic recovery indicates another turnaround

Figure 2.4: Domestic material consumption per inhabitant, EU-27
(tonnes per inhabitant)



NB: Eurostat estimates.

Source: Eurostat (online data codes: tsdpc220 and demo_gind)

Overall, between 2000 and 2011 domestic material consumption (DMC) per inhabitant fell by more than 6 % in the EU. However, this trend was not continuous and occurred in several phases: a slight fall from 2000 to 2003, followed by an increase until 2007 and a sharp drop since then, particularly in 2009. A fourth phase, reflecting the recovery from the economic crisis, can be seen in a rise in domestic material consumption in 2011.

The main driving force behind the increase in DMC between 2003 and 2007 was continued growth in affluence and per capita consumption. This was particularly so in Western European countries, with Eastern European countries rapidly catching up. Ultimately, this has increased demand for energy and resources ([11]). In addition, globalisation and trade liberalisation have encouraged this spurge in domestic demand by providing easier access to global resources.

The economic crisis curtailed material consumption

After the peak in 2007, domestic material consumption dropped sharply due to the impacts of the economic slowdown ([12]). In 2010, each EU citizen consumed on average 2.7 tonnes less than in 2007. However, during 2010 and 2011 domestic material consumption was on the rise again, mainly driven by increased domestic extraction.

Decline was mainly driven by decline in extraction

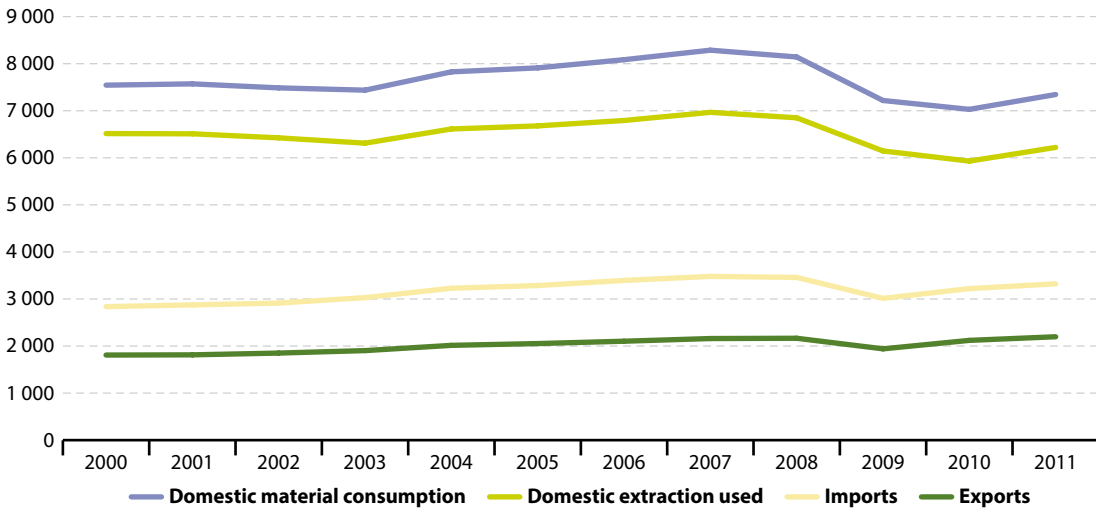
A closer look at domestic material consumption shows that the reduction between 2007 and 2010 was mainly driven by a 15 % slowdown in domestic extraction. A fall in imports and growth in exports played a minor role.

Domestic material extraction *is the amount of raw material (except for water and air) extracted from the natural environment.*

([11]) European Environment Agency, *The European Environment: State and Outlook 2010*, 2010, p.4
([12]) European Environment Agency, *Consumption and the Environment — 2012 Update*, p.21.

This trend represents a considerable shift after the prolonged period of growth in domestic extraction and imports from 2003 to 2007 before the economic crisis. Nevertheless, imports were again on the rise in 2010, increasing by 7 % compared to 2009. This implies that environmental impacts related to EU material consumption patterns are increasing outside the EU.

Figure 2.5: Components of domestic material consumption, EU-27
(million tonnes)



NB: Eurostat estimates.
Source: Eurostat (online data code: tsdpc220)

Since the recovery from the economic crisis, domestic extraction, which grew by almost 5 % between 2010 and 2011, has been the main driver behind domestic material consumption in the EU.

Impacts of the crisis on the construction sector significantly reduced non-metallic minerals consumption

Non-metallic minerals ([13]) constitute the largest fraction of total DMC. However, during the crisis their share reduced by more than 20 %, from 52 % to 48 %, between 2007 and 2010. This trend is not surprising given that non-metallic minerals (in particular sand and gravel) are heavily used in construction, a sector which has been hit hard by the economic crisis. In Ireland, Greece and Spain, which all had construction booms before the crisis and a property bubble burst ([14]) afterwards, the demand for non-metallic minerals in the period 2007 to 2010 fell by 71 %, 53 % and 47 % respectively.

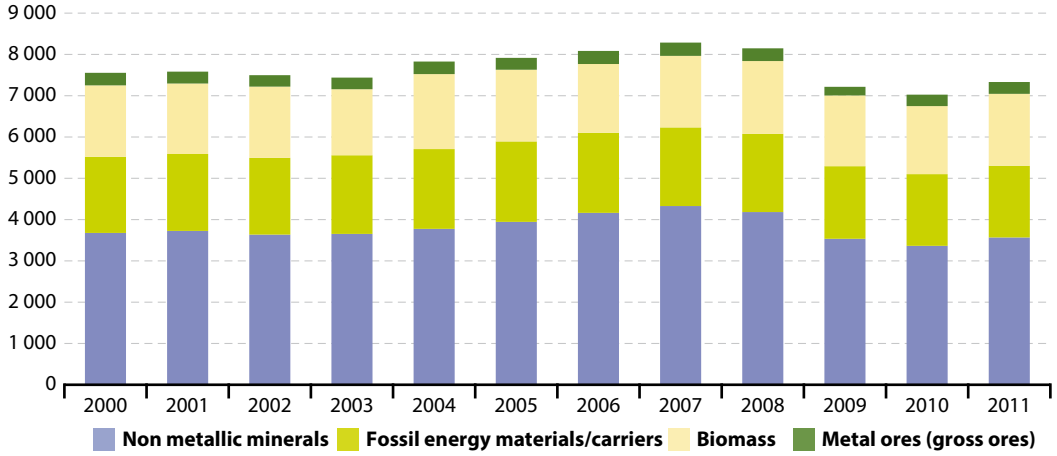
Similar to non-metallic minerals, metal ores have also shown a sizeable reduction of 14 % between 2007 and 2010 after their peak in 2007. The decline in fossil energy materials/carriers and biomass in this period was less pronounced, at 9 % and 5 % respectively.

However, during 2010 and 2011, when most of the European economies recovered from the crisis, consumption of biomass, non-metallic minerals, metal ores and fossil energy materials started to rise again.

***Non-metallic minerals** include sand, gravel, limestone and fertiliser minerals (among others).*

([13]) A classification for non-metallic minerals can be found here: Eurostat, 2012, *Economy-wide Material Flow Accounts (EW-MFA) — Compilation Guide 2012*, p. 40.
([14]) Eurostat, 2011, *Key figures on European business with a special feature on SMEs*, p. 70–71.; Eurostat, 2009, *European Business — facts and figures*, p. 346–348; 351

Figure 2.6: Domestic material consumption by materials, EU-27
(million tonnes)



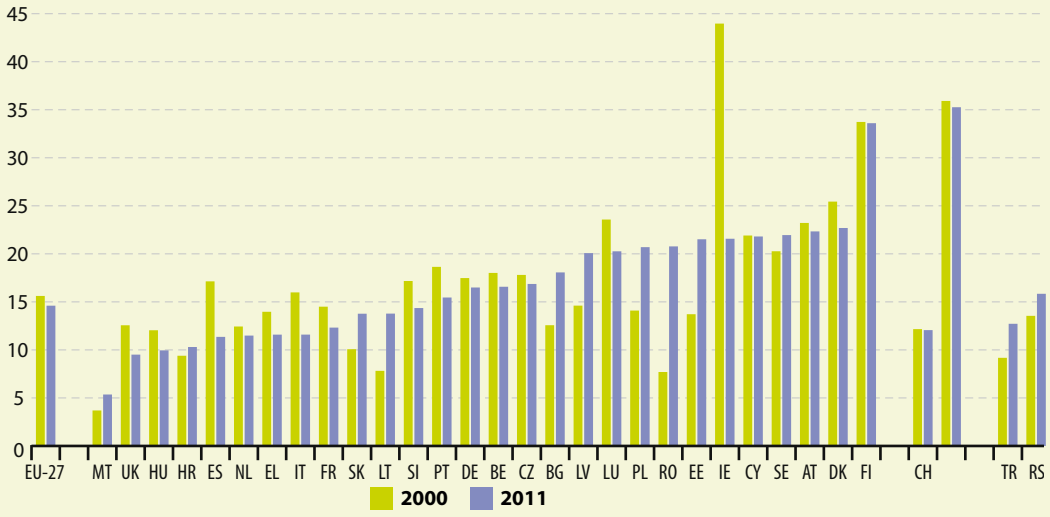
NB: Eurostat estimates.

Source: Eurostat (online data code: tsdpc230)

How domestic material consumption varies between Member States

In 2011, per capita material consumption accounted for a six-fold difference across Member States. Malta used only 5.4 tonnes per capita compared with Finland's 33.6 tonnes per capita. In 18 European countries the annual amount of materials consumed per citizen exceeded the EU average. In Finland and Norway, in particular, the difference from the EU average was more than twofold. Country variations in DMC are likely to be shaped by a number of complex and interrelated factors including income levels, living standards, population density, climate, infrastructure, production structure of the economy and energy generation mix. More subtle socio-cultural influences related to habits and social norms will also play a part ([15]).

Figure 2.7: Domestic material consumption per inhabitant, by country
(tonnes per inhabitant)



NB: EU-27 data are estimates; 2001 data (instead of 2000) for HR and RS; 2008 data (instead of 2011) for NO, 2010 data (instead of 2011) for CH, TR and RS.

Source: Eurostat (online data codes: tsdpc220 and demo_gind)

Eastern European countries and the Baltic Member States experienced the highest increase in domestic material consumption in the past decade (2000 to 2011), with average annual growth rates ranging from 3 % and 12 %. At one extreme, Estonia and Lithuania increased by more than 50 % while Romania more than doubled the amount of materials used per capita over this period. However, Lithuania and Romania started at levels more than half that of the EU average. To a lesser degree, consumption patterns also became more material intensive in Slovakia, Bulgaria, Malta and Poland. At the other end of the scale, 16 Member States managed to reduce their DMC per capita over the same period. Among these, Ireland and Spain achieved the most notable reductions of more than 50 % and 34 % respectively.

What lies beneath this indicator?

The normal functioning and prosperity of Europe's economy and society in general depend on use of natural resources. These resources include renewables such as biomass as well as non-renewables such as fossil fuels, metals and minerals. At the same time, Europe's growing demand for materials puts its natural resource base at danger. It also creates environmental pressures including climate change, biodiversity loss, scarcity of fertile land, soil degradation and waste accumulation. In this respect, the efficient management and use of materials is essential for resource security and increased resilience of ecosystems. To give an insight on these problem areas, the DMC indicator measures the total amount of material directly used in an economy.

Box 2.2: A more precise metric for measuring an economy's material throughput is being developed

Beside the domestic extraction of raw materials the indicator 'domestic material consumption' (DMC) considers both imports (added) and exports (deducted) through their simple product weight when crossing the borders. This makes cross-country comparisons 'asymmetric'. A country with almost no domestic extraction and importing all necessary resources indirectly in the form of mainly finished products (for example, Malta) will have a much lower DMC compared to a resource rich country (such as Sweden).

The indicator 'raw material consumption' (RMC) measures the imports and exports in their raw material equivalents (RMEs) — the equivalent amount of domestic extraction of raw material that would be needed to manufacture the respective traded good. Eurostat estimates the imports and exports in raw material equivalents employing an extended input–output model. However, these model calculations are only done for the aggregated EU economy. The results enable Eurostat to estimate the RMC for the EU in a breakdown by four main material categories (see below table).

In 2011, RMC of the aggregated EU economy amounted to 15.3 tonnes per capita, of which non-metallic minerals accounted for 46 %, fossil energy resources for 23 %, biomass for 22 %, and metal ores for 10 %.

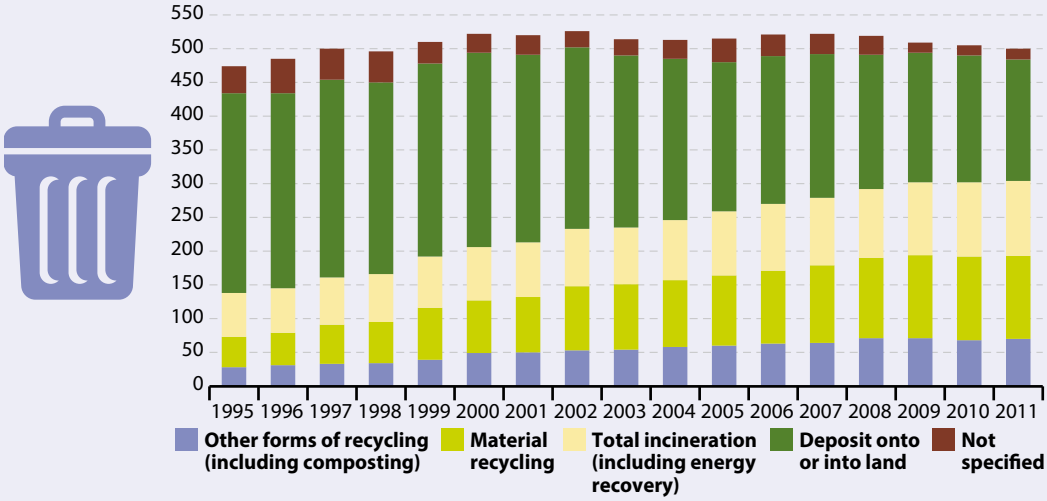
Table 2.1: Raw material consumption (RMC) by main material categories, EU, 2000–2011
(tonnes per capita)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	%
RMC total	16.4	16.7	16.6	16.5	16.8	16.8	17.2	17.4	17.1	15.4	14.8	15.3	100 %
Biomass	3.5	3.5	3.5	3.2	3.6	3.5	3.3	3.4	3.5	3.3	3.2	3.3	22 %
Metal ores	1.3	1.5	1.7	1.7	1.4	1.3	1.5	1.4	1.4	1.5	1.5	1.5	10 %
Non-metallic minerals	7.6	7.7	7.4	7.4	7.6	7.9	8.4	8.6	8.3	7.0	6.6	7.0	46 %
Fossil energy materials/carriers	4.0	4.1	4.0	4.1	4.1	4.1	4.1	4.0	4.0	3.6	3.5	3.5	23 %

Municipal waste generation and treatment

Over 50 % more waste recycled or composted between 2000 and 2011. Significant improvements in waste management were driven by EU and national strategies for efficient waste management

Figure 2.8: Municipal waste generation and treatment, by treatment method, EU-27 (kg per capita)



Source: Eurostat (online data code: tsdpc240)

Between 2000 and 2011 Europe experienced significant improvement in its waste management. This encompasses recovered and reprocessed waste through recycling and composting and waste transformed into energy through incineration or disposed of at a landfill site.

Box 2.3: A hierarchy of sustainable waste treatment

The revised EU Waste Framework Directive distinguishes between more desirable and less desirable ways of waste treatment in a hierarchical manner: waste prevention and minimisation is the top priority followed by treatment methods such as reuse and recycling, energy recovery through incineration and, last, disposal in the form of landfilling ([16]).

In this regard, recycling and composting are the most environmentally friendly ways of treating waste. Recycling, for example, saves valuable resources (for example metals or glass) which can be reprocessed into new goods. The process of composting of biodegradable waste produces valuable fertilisers for agricultural production.

Overall, recycling and composting lead to a reduced amount of waste that needs to be disposed of, and reduce the demand for raw materials, leading to a reduction in primary resource extraction.

Waste incineration might reduce the amount of waste to be disposed of, but valuable resources are lost in the process. Landfilling too leads to loss of valuable resources and, in addition, poses the danger of air, surface water bodies and groundwater pollution.

([16]) Directive 2008/98/EC of the European Parliament and of the Council on Waste, 2008.

In 2000 more than half of municipal waste — originating from everyday household waste and other sources such as commerce, offices and public institutions — was still being landfilled (58.4 %). But by 2011 there had been a clear shift towards recycling and composting (40.0 %) and incineration with energy recovery (23.0 %). This improvement in waste management has been to a large extent driven by EU and national strategies prioritising efficient waste management through various instruments. These include the establishment of targets for recycling and recovery, imposition of taxes and other restrictions on landfill waste ([17]). The trend towards sustainable waste management has also been reinforced by some external factors such as the increase in urbanisation and population densities and the rise in prices of raw material, recycled materials and fuels ([18]).

Box 2.4: A European approach towards more sustainable waste management

The Thematic Strategy on Waste Prevention and Recycling ([19]) as an overarching framework and accompanying Directives on Landfill ([20]) and Incineration ([21]) are considered the main pillars of EU waste policy.

The revised EU Waste Framework Directive sets a quantitative target for increasing recycling rates of households. It calls on Member States to recycle or prepare for reuse 50 % of household waste by 2020 ([22]). In addition, the Directive provides a general waste management framework, which prioritises waste prevention as the most effective way of decoupling waste generation from economic growth and environmental impacts.

To minimise the environmental pressures from municipal waste, the EU Directive on Landfill requires Member States to reduce the amount of heavily polluting biodegradable municipal waste sent to landfill from 50 % by 2009 and to 35 % by 2016 ([23]).

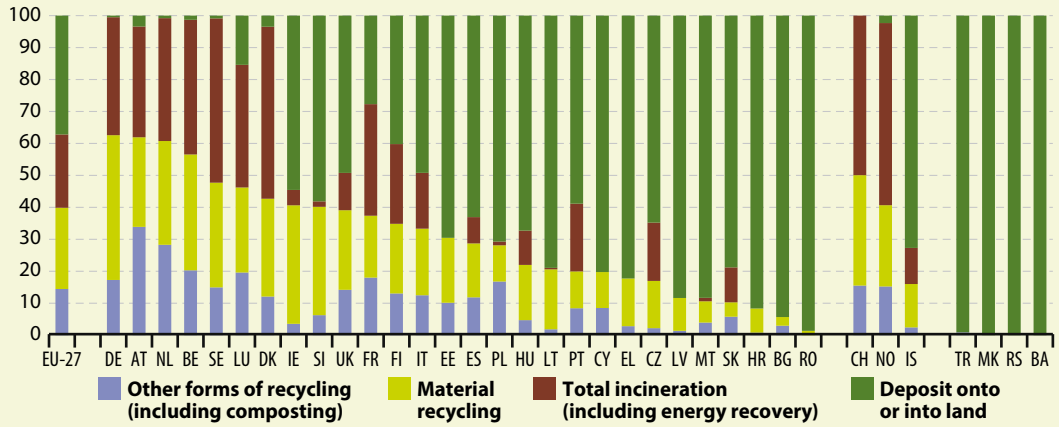
How municipal waste generation and treatment varies between Member States

The overall EU picture conceals large differences between countries both in terms of the level and dynamics of municipal waste treatment. Croatia, Bulgaria and Romania landfill more than 90 % of their municipal waste, whereas in Germany, Netherlands and Sweden less than 1 % is disposed of in this way. Strict rules such as landfill bans for untreated or combustible waste in countries such as Germany, Sweden and Austria are largely responsible for this trend ([24]). With regard to Romania and Bulgaria, 'combustion wastes' from energy sources account for a significant share of landfilled waste ([25]).

Most old Member States (Denmark, Luxembourg, Germany, Netherlands, Sweden, Belgium, Austria and France, in particular) as well as Norway and Switzerland show relatively high recycling (including composting) and incineration rates both above 30 %. The large discrepancies across EU Member States reflect some gaps in the implementation of EU waste objectives into national legislation. These gaps are due to a series of technical, market or administrative barriers ([26]).

([17]) EEA (2013), *Managing municipal solid waste— a review of achievements in 32 European countries*, EEA Report No 2/2013. 1–36.
([18]) European Environment Agency, *Consumption and the Environment: 2012 Update,2012*, p. 25.
([19]) European Commission Communication, *Taking sustainable use of resources forward: A Thematic Strategy on the prevention and recycling of waste*, COM(2005) 666.
([20]) Council Directive 1999/31/EC on the Landfill of Waste, 1999.
([21]) Directive 2000/76/EC on the incineration of waste.
([22]) Directive 2008/98/EC of the European Parliament and of the Council on Waste, 2008, p. 13.
([23]) Council Directive 1999/31/EC on the Landfill of Waste, 1999.
([24]) http://eurostat.ec.europa.eu/statistics_explained/index.php/Waste_indicators_on_generation_and_landfilling_—_monitoring_sustainable_development
([25]) Ibid.
([26]) BIO Intelligence Service, *Implementing EU Waste Legislation for Green Growth,* Final Report prepared for European Commission DG ENV, 2011.

Figure 2.9: Municipal waste treatment, by type of treatment method, by country, 2011
(%)



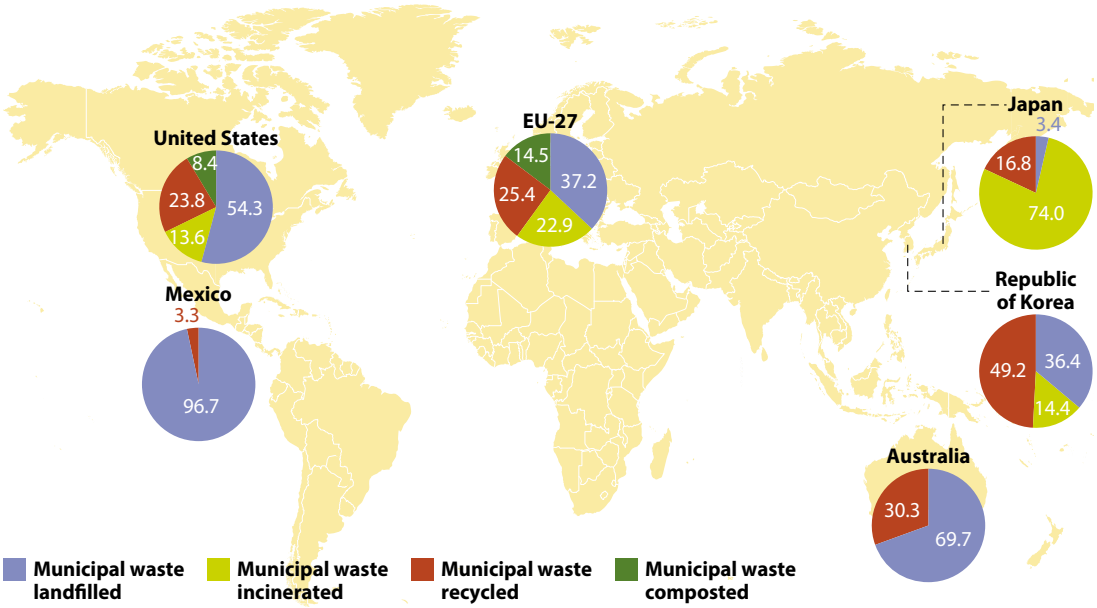
NB: Data are estimates for DE, ES, FR, CY, LT, LU, PL, IE, IT, AT, RO, UK, IS and PT

Source: Eurostat (online data code: tsdpc240)

EU trends in municipal waste treatment compared with other countries in the world

At the international level ([27]), Europe is outperforming countries such as the United States and Japan with regard to shifting waste management practices away from landfilling and incineration towards more environmentally friendly ones such as recycling. About 40 % of Europe's waste is recycled or composted. The only country surpassing Europe is the Republic of Korea, accounting for almost 50 %.

Figure 2.10: Municipal waste treatment, by country, 2011
(%)



NB: 2003 data (instead of 2011) for AUS, JP; 2004 data (instead of 2011) for Republic of Korea, 2005 data (instead of 2011) for US; 2006 data (instead of 2011) for Mexico; 2011 data for EU-27

Source: UNSD/UNEP Questionnaires on Environment Statistics, Waste section; OECD Environmental Data Compendium, Waste section; Eurostat (online data code: tsdpc240)

([27]) The comparison is based on a selection of G20 countries in comparison to Eurostat EU-27 data.

What lies beneath this indicator?

Waste has become increasingly recognised as an important material resource and potential energy source. In this respect, it can generate economic value and help to decouple resource use from economic growth ([28]). Environmentally friendly ways of waste management such as recycling and composting reduce negative impacts on the environment and human health. Increasing the proportion of waste recycled and composted reduces the amount of waste to be disposed of as well as reducing primary resource extraction.

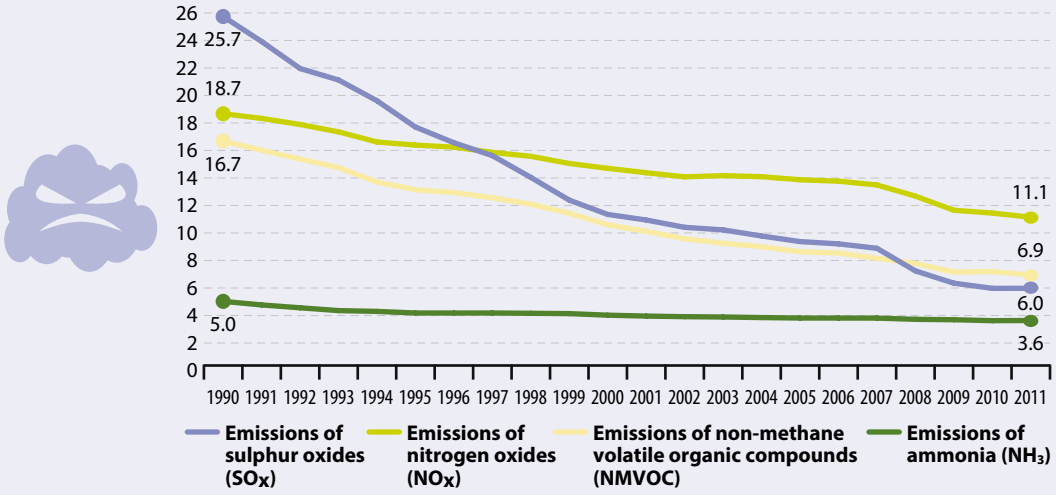
The municipal waste treatment indicator presents the amount of municipal waste recovered through recycling and composting as well as the amount disposed of through landfilling and through incineration.

([28]) European Environment Agency, *Consumption and the Environment: 2012 Update*, 2012, p.6.

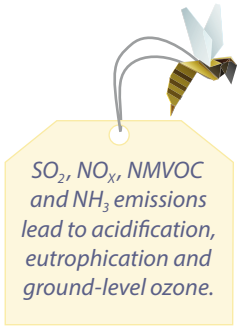
Atmospheric emissions

Significant fall in emissions of the four air pollutants SO_x, NO_x, NMVOC and NH_3 between 2000 and 2011. Regulatory actions, in particular emission ceiling targets, contributed to the decline

Figure 2.11: Atmospheric emissions, EU-27
(million tonnes)



Source: European Environment Agency (online data codes: tsdpc260, tsdpc270, tsdpc280 and tsdpc290)



Overall, between 2000 and 2011 man-made emissions of ammonia (NH_3), sulphur oxides (SO_x), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NMVOC) declined in the EU. Emission reductions of certain pollutants have reduced the effects on human health and on the environment. This trend of declining air pollution can be traced to 1990, when air pollution, in particular SO_x emissions, were about 1.5 to more than 4 times higher than today.

A recent analysis suggests that thanks to regulatory actions, air pollution and its associated public health impacts will fall by 2020 across Europe. This may lead to a reduction in public health costs ([29]). However, according to the latest conclusions of the World Health Organisation (WHO), considerable health effects of air pollution exist at levels commonly present in Europe ([30]). The WHO review indicates that less severe health impacts of large parts of the population (i.e continuous exposure in major cities) are still prevalent. In this regard, overall costs of the less severe health impacts may therefore be higher than the sum of the most severe effects.

([29]) J. Brandt, J., Silver, J. D., Christensen, J. H. et al. (2013) *Assessment of past, present and future health-cost externalities of air pollution in Europe and the contribution from international ship traffic using the EVA model system.* Atmospheric Chemistry and Physics Discussions. 13: 5923–5959
([30]) WHO, 2013, *Review of evidence on health aspects of air pollution — REVIHAAP Project Technical report,* World Health Organization, Regional Office for Europe, Copenhagen, Denmark.

Box 2.5: European legislation for air quality and emissions reductions

Overall, the EU Sustainable Development Strategy under the 'environment protection' key objective aims to 'prevent and reduce environmental pollution'.

More specifically, European legislation on atmospheric pollution has applied a twin-track approach of establishing air quality objectives together with measures to reduce emissions. The most prominent instruments are the EU Air Quality Directive ([31]) and the thematic strategy on air pollution ([32]). They include objectives and targets for health and environment up to 2020 as well as focusing on the most harmful pollutants and the sectors and policies that have the most impact ([33]). In this regard the National Emission Ceilings Directive (NECD) sets upper limits for each Member State ([34]) for the total emissions by 2010 of the four pollutants responsible for acidification, eutrophication and ground-level ozone (SO_2, NO_x, NMVOC and NH_3).

EU achieves emission ceiling targets for two main air pollutants

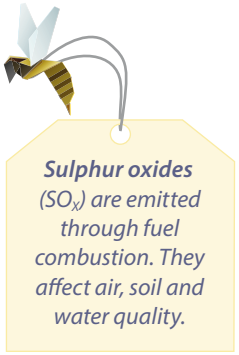
In 2011, EU-27 emissions levels for SO_X and NMVOC were lower than the EU-27 emission ceilings outlined in the National Emission Ceilings Directive (NECD), Annex II ([35])([36]), whereas NO_X emissions slightly surpassed (9.5 %) the EU-27 target ([37]). For NH_3 emission, for which no EU-27 emission ceiling target exists, levels are below the aggregated emission ceiling of EU Member States given in Annex I.

At Member State level, 12 countries reported emissions above the ceiling of at least one pollutant based on the final 2011 data. However, more than three-quarters of Member States reported declining emissions of NO_X and NMVOC between 2010 and 2011. More than two-thirds had reduced SO_2 and NH_3 emissions ([38]).

SO_X experienced radical reductions due to cleaner sources of energy production

Of the four pollutants monitored here, SO_X emissions decreased most. On average, they fell by 5.7 % per year from about 11 million tonnes in 2000 to slightly below 6 million tonnes in 2011. Energy production and use, in particular through burning fuel in public power and heat-generating plants, is the main source of SO_X emissions. It accounted for almost 60 % of total emissions in 2011. Between 2000 and 2011 emissions from energy-related sources fell by 7.5 % per year, due to a combination of factors such as the economic recession and its impacts on energy demand, increased uptake of renewable energy, switching fuel away from high sulphur solid and liquid fuels to low sulphur fuels and the closure of certain power plants ([39])([40]).

Moreover, in the previous decade significant structural changes in Eastern European countries since the early 1990s have contributed to lower SO_X emissions. In recent years, however, high energy prices have led power plants in some countries to start increasing coal use again ([41]).



Sulphur oxides *(SO_X) are emitted through fuel combustion. They affect air, soil and water quality.*

([31]) Directive 2008/50/EC on ambient air quality and cleaner air for Europe.
([32]) For analyses of trends in emissions of, and exposure to, particulate matter, see the chapters on 'public health' and 'sustainable transport'.
([33]) Commission Communication, *Thematic Strategy on air pollution*, COM(2005) 446.
([34]) Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants.
([35]) EEA (2013) NEC Directive status report 2012 Reporting by the Member States under Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants, EEA Technical report No. 6/2013, p. 7; 2011 date are provisional
([36]) Annex II emission ceilings for the European Union are stricter than the aggregated Member State emission ceilings given in NECD Annex I. There is no ceiling for NH3 in Annex II of the NECD. Emission ceilings given in Annex II to the NECD are designed with the aim of attaining the European Union's interim environmental objectives set out in Article 5 of the NECD by 2010.
([37]) EEA (2013) NEC Directive status report 2012 Reporting by the Member States under Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants, EEA Technical report No. 6/2013, p. 7; 2011 date are provisional
([38]) Ibid. p. 30
([39]) EEA, (2013), *European Union emission inventory report 1990. 2011 under the Convention on Long-range Transboundary Air Pollution (LRTAP)*, EEA European Environment Agency (EEA) Technical report No. 10/2013, p. 13.
([40]) EEA (2013), *Reducing air pollution from electricity-generating large combustion plants in the European Union*, EEA Technical report No. 9/2013, p. 5; 35–36
([41]) EEA (2010), *The European environment — state and outlook 2010: Air pollution*. Copenhagen: European Environment Agency, p. 24

Technology shifts and legislation are main reasons for NO_X emission reductions

Nitrogen oxides (NO_X) are emitted through fuel combustion. They lead to acidification, which harms soil and water quality.

EU emissions of nitrogen oxides mainly stem from transport and energy production and use, where NO_X is emitted during fuel combustion. In 2011 these two sources accounted for almost half of total NO_X emissions. The 2.5 % annual decline between 2000 and 2011, from 14.7 million tonnes to 11.1 million tonnes, was mainly driven by a 4.4 % per year reduction in transport emissions ([42]). The decline in the energy sector was less pronounced, at 2.4 % per year. Overall, the EU legislative instruments most relevant for NO_X emission reductions relate to emissions from motor vehicles (Euro emission standards) and fuel combustion in industry and power production ([43]). In the transport sector in particular reductions have been achieved mainly through legislative measures requiring abatement of vehicle tailpipe emissions ([44]), although these standards have not delivered the scale of reduction originally expected. However, a considerable fraction of the vehicle fleet is still based on conventional (pre-Euro) technology ([45]). In the energy-related sources, measures such as combustion modification technologies and fuel-switching from coal to gas have helped reduce NO_X emissions ([46]).

NMVOC reductions mainly due to regulation of solvent use and emissions

Non-methane volatile organic compounds (NMVOC) are emitted by a number of activities including combustion, solvent use and production processes. They contribute to the formation of ground-level ozone, which can harm human health.

Between 2000 and 2011 emissions of NMVOCs, which are important ground-level ozone precursors, fell by 3.8 % per year, from 10.6 million tonnes in 2000 to 6.9 million tonnes in 2011. The main contributor to NMVOC emissions reductions over this period was transport, with emissions falling by 10.1 % per year. Solvent and product use remained the main source of NMVOC emissions. They accounted for more than 40 % in 2010, after declining only moderately by 2.1 % per year between 2000 and 2010. Overall, the decline in EU NMVOC emissions was mainly a result of the introduction of vehicle catalytic converters and legislative measures limiting solvent use and emissions in non-combustion sectors ([47]).

A modernising agricultural sector drives NH_3 reductions

Ammonia (NH_3), mainly emitted by the agricultural sector, contributes to acidification and eutrophication which affect soil and water quality.

Of the four air pollutants monitored here, emissions of NH_3 declined the least. On average they fell by 0.9 % per year from 4.0 million tonnes in 2000 to 3.6 million tonnes in 2011. The transport, household, commercial sectors, and industry, showed the biggest reductions, with emissions falling by 4.1 %, 1.7 % and 1.6 % per year respectively. However, together they only accounted for 3.3 % of total NH_3 emissions in 2011. The vast majority of ammonia emissions come from activities such as manure storage, slurry spreading and use of synthetic nitrogenous fertilisers in the agricultural sector. Overall the agriculture sector accounted for about 93 % of total NH_3 emissions in 2011. The decline of 0.9 % per year between 2000 and 2011 in agricultural NH_3 emissions was primarily due to intensification of livestock production (especially cattle) ([48]), changes in the handling and management of organic manures and decreased use of nitrogenous fertilisers ([49]).

What lies beneath this indicator?

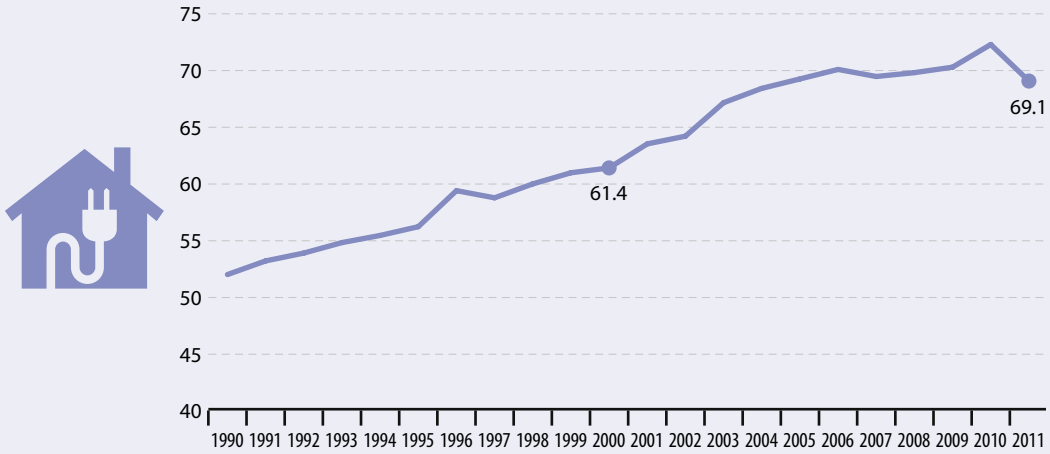
Air pollution — from man-made atmospheric emissions of sulphur oxides (SO_X), nitrogen oxides (NO_X), non-methane volatile compounds (NMVOC) and ammonia (NH_3) — damages human health and the environment. Effects on human health can range from minor respiratory irritation to cardiovascular diseases and premature death. Adverse environmental impacts include eutrophication and acidification of ecosystems, damage to ecosystems and crops through exposure to ozone, and damage to materials and cultural heritage, such as monuments, due to exposure to acidifying pollutants and ozone. Thus, the indicator measures the environmental pressures through atmospheric emissions.

([42]) See the indicator 'emissions of nitrogen oxides from transport' in the 'sustainable transport' chapter.
([43]) EEA (2012), *Air quality in Europe — 2012 report*, EEA Report No 4/2012, p. 62
([44]) EEA, (2013), *European Union emission inventory report 1990*. 2011 under the Convention on Long-range Transboundary Air Pollution (LRTAP), EEA Technical report, EEA Technical report No. 10/2013, p. 13.
([45]) EEA (2013), *Proportion of vehicle fleet meeting certain emission standards (TERM 034)*, Assessment published Mar 2013, accessed 20 June 2013.
([46]) EEA, (2013), *European Union emission inventory report 1990*. 2011 under the Convention on Long-range Transboundary Air Pollution (LRTAP), EEA Technical report, EEA Technical report No. 10/2013, p. 13.
([47]) EEA (2010), *The European environment — state and outlook 2010: Air pollution*, Copenhagen: European Environment Agency, p. 27
([48]) EEA (2010), *The European environment — state and outlook 2010: Land use*, Copenhagen: European Environment Agency, p. 32.
([49]) EEA (2013), *Ammonia (NH_3) emissions (APE 003)*, Assessment published Dec 2012, accessed 20 June 2013.

Electricity consumption of households

One third increase in household electricity consumption in the EU between 2000 and 2011. An increase in the number of smaller households contributed to this trend

Figure 2.12: Electricity consumption of households, EU-27
(million tonnes of oil equivalent)



Source: Eurostat (online data code: tsdpc310)

Between 2000 and 2011 household electricity consumption grew continuously in the EU, on average by 1.1 % per year. This growth, however, was considerably slower than the annual 2 % increase over the previous decade (1990 to 2000). The effect of rather warm winters may have cushioned further growth in electricity consumption during the past decade ([50])([51]).

Between 2005 and 2011 EU average electricity consumption per household was reduced by 8.7 %. However, this positive trend occurred against the background of a rising number of smaller households (between 2005 and 2012 the average number of people living in private households in the EU fell by 8 %, from 2.5 to 2.3), ultimately leading to higher electricity consumption in absolute terms ([52]).

Increased usage and rising ownership outweigh efficiency gains

Energy efficiency is a key target under the Europe 2020 strategy. However, one factor that might undermine the success of energy efficiency measures in achieving a persistent reduction in domestic electricity consumption is the 'rebound effect'. For example, although the energy efficiency of some home appliances have advanced significantly over the past two decades, this has also been accompanied by rising ownership and usage, driving an increase in overall electricity consumption ([53]).

Slowdown in household electricity consumption

After reaching a record high of 72.3 million tonnes of oil equivalent in 2010, EU domestic electricity use, which had been rising continuously, went into reverse in 2011. During this year household consumption fell sharply by 4.5 %. This sudden slowdown was largely driven by significant reductions in several Member States.

([50]) Joint Research Centre and Institute for Energy, 2009, *Electricity Consumption and Efficiency Trends in the European Union. Status Report. JRC Scientific and Technical Reports*, EUR 24005 EN. p. 81.
([51]) Luterbacher, J., et al, '*Exceptional European warmth of autumn 2006 and winter 2007: Historical context, the underlying dynamics, and its phonological impacts*', Geophys. Res. Lett., vol. 34.
([52]) European Commission, *Energy Efficiency Status Report*, 2012. p. 16.
([53]) European Environment Agency, *Consumption and the Environment — 2012 Update*, 2012, p. 33.

Box 2.6: Energy Efficiency is at the heart of EU legislation

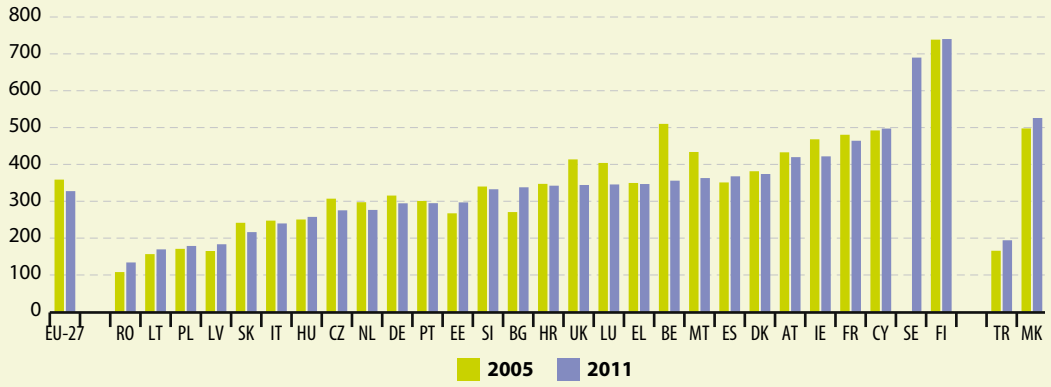
Promotion of energy efficiency under the Europe 2020 strategy is a key policy area for achieving sustained reductions in household energy consumption. The Energy Efficiency Directive ([54]), adopted by the EU in October 2012, calls for a wide range of measures aimed at changing energy consumption practices and promoting uptake of energy efficient solutions ([55]). In the context of the Europe 2020 strategy, the directive contributes to the overall objective of the energy efficiency target of saving 20 % of the EU's primary energy consumption by 2020. Based on projections made in 2007 this translates into a primary energy consumption of 1 474 million tonnes of oil equivalent in 2020 or a final energy consumption of 1 078 million tonnes of oil equivalent ([56]). Moreover, Directive 2006/32/EC ([57]) sets Member States an intermediate target of reducing their primary energy consumption by 9 % by 2016.

How electricity consumption of households varies between Member States

Almost all EU Member States, except some Eastern European countries, experienced a reduction in per household electricity consumption over the period 2005 to 2011. Romania and Bulgaria recorded the highest increases, by almost one quarter compared to 2005 levels.

In 2011 large cross-country variations still persisted, with the extreme being a six-fold difference in per household electricity consumption between Finland and Romania. These disparities are likely to be influenced by a number of socioeconomic factors including variations in disposable income and electricity prices, but also by climate, lifestyles, average household size and energy efficiency of dwellings, among others ([58]).

Figure 2.13: Electricity consumption per household, by country
(kg of oil equivalent per household)



NB: 2005: no data for SE

Source: Eurostat (online data code: tsdpc310, lfst_hhnhtych)

What lies beneath this indicator?

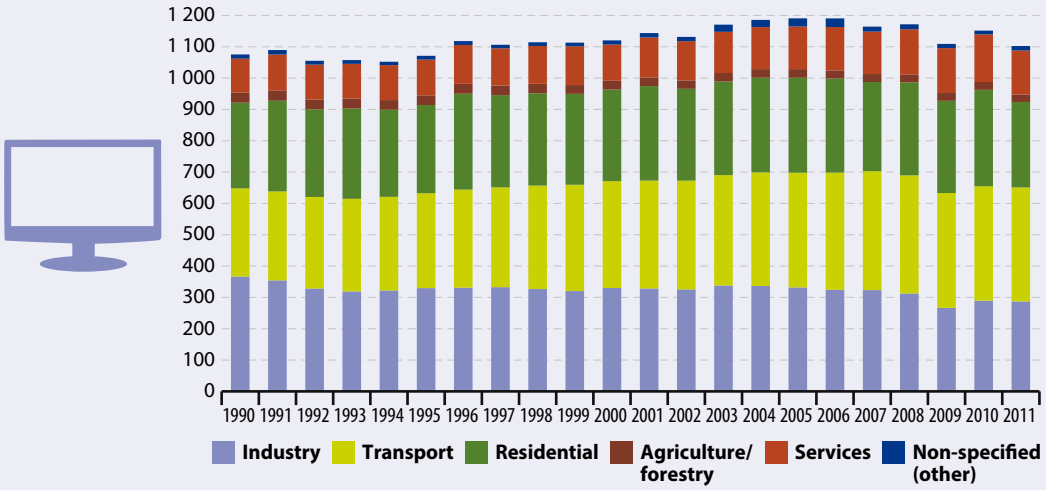
Electricity is an essential part of people's daily lives, enabling them to meet some of their basic human needs from lighting, cooking and heating to cleaning and entertainment. However, high and continuously growing domestic electricity consumption places pressure on the environment when the electricity generation mix is dominated by carbon-intensive sources. In this respect, measures targeting end-consumer behaviour, by encouraging people to be more energy-efficient and to use less energy, can have the potential for achieving significant energy savings. Electricity consumption of households represents the total amount of electricity consumed by all households.

([54]) Directive 2012/27/EU on energy efficiency.
([55]) European Environment Agency, *Achieving Energy Efficiency through Behaviour Change: What does it take?*, 2013, p. 8.
([56]) Directive 2012/27/EU on energy efficiency, para. 2.
([57]) Directive 2006/32/EC on energy end-use efficiency and energy services
([58]) European Environment Agency, *Consumption and the Environment — 2012 Update*, 2012, p. 32.

Final energy consumption

1.6 % drop in final energy consumption in the EU between 2000 and 2011. It is unclear to what extent the economic crisis drove this decline

Figure 2.14: Final energy consumption, by sector, EU-27
(million tonnes of oil equivalent)



Source: Eurostat (online data code: tsdpc320)

Between 1990 and 2011 the amount of energy consumed by all end-use sectors in the EU increased by 2.5 %. This offset the positive environmental impacts of improvements in the energy production mix and other technological developments achieved in the same period ([59]). Final energy consumption was continuously on the rise after 1990, with the fastest increase recorded during the period 2000 and 2004, at 1.4 % per year.

A number of EU policy objectives require a certain level of final energy reduction through improvements in energy efficiency and conservation.

End use sectors are considered as final consumers for all kinds of energy uses.

Box 2.7: EU legislation on reductions in energy consumption

The Europe 2020 strategy includes specific headline targets for reducing greenhouse gas emissions by 20 %, rising the share of renewable energy in final energy consumption to 20 % and ensuring a 20 % increase in energy efficiency by 2020. Moving towards these targets depends on innovations and technological improvements on the supply side of energy, but equally importantly on the promotion of sustainable energy consumption.

The effects of the economic crisis

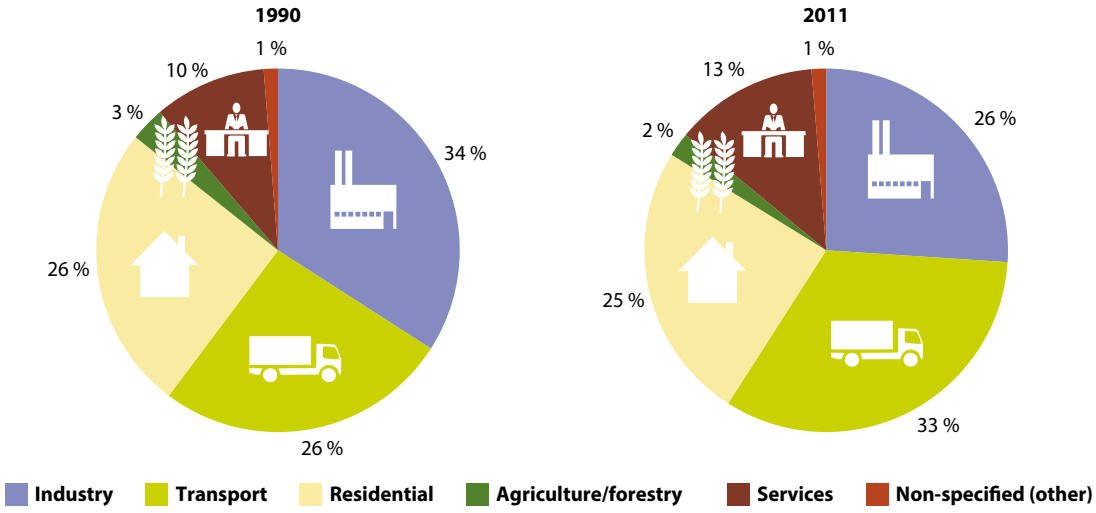
After reaching a peak in 2005, final energy consumption stabilised and then fell almost continuously until 2011 by a total of 7.4 %. This trend was partially influenced by the economic downturn. The strongest reduction, of 5.4 % between 2008 and 2009, was followed by an upswing in 2010 (3.8 %), mainly attributed to the signs of mild recovery from the recession ([60]). However, the strong reduction of 4.3 % in 2011 brought final energy consumption back to a level similar to that of 2009.

([59]) European Environmental Agency, *Final energy consumption by sector (CSI 027/ENER 016)*, 2013.
([60]) Ibid.

Transport and services have driven final energy consumption over the past two decades

In 2011, as in previous years, the transport sector continued to dominate the final energy consumption mix, accounting for one third, followed by households and industry, amounting to one quarter of final energy consumption respectively. However, compared with the 1990s the transport and service sectors increased significantly, by almost one third each. The surge in energy use in the service sector has been attributed to the steady increase in the demand for electrical appliances (mainly information and communication technologies) and other energy-intensive technologies (air conditioning, for example). The increase in the transport sector, on the other hand, was mainly driven by growth in passenger and freight transport (as a result of changing lifestyles, growing demand for private car ownership, growing urban settlements), largely offsetting improvements in fuel efficiency ([61]).

Figure 2.15: Final energy consumption, by sector, EU-27
(% of final energy consumption)



Source: Eurostat (online data code: tsdpc320)

Industrial and agricultural sectors have experienced large reductions since 1990

These unfavourable trends were to some extent compensated for by large reductions in energy use achieved in other areas between 1990 and 2011. Industrial and agricultural sectors reduced energy use by 21.7 % and 27.7 % respectively. This reflected EU Member States' gradual transition towards service-based economies, a shift towards less energy-intensive manufacturing modes and the negative economic impact of the recession ([62]).

However, energy consumption should be seen in the bigger picture of other consumption patterns. The number of private cars in the EU in relation to the population (the motorisation rate) has increased in most Member States over the past few years (even during the crisis), as has consumption expenditure of households. The impact of the economic crisis on actual individual consumption of EU households was relatively moderate, as rising government consumption counterbalanced at least partly a more significant contraction in household consumption ([63]).

([61]) European Environmental Agency, *Final energy consumption by sector (CSI 027/ENER 016)*, 2013.
([62]) Ibid.
([63]) European Commission, Statistics in Focus 2/2013, *Analysis of EU-27 household final consumption Expenditure,* 2013, p. 1.

What lies beneath this indicator?

Economies rely on energy to function and grow. However, excessive energy demand can lead to serious environmental pressures if the energy is produced and consumed in an unsustainable way. Increased energy consumption can also deplete fossil fuels and intensify the EU's dependency on imported energy. One solution for relieving the environmental and economic pressures related to energy use is to reduce the overall scale of energy consumption through energy efficiency or conservation.

The indicator 'final energy consumption by sector' expresses the sum of energy supplied to the final consumer's door for all energy uses, broken down by consuming sector. It excludes deliveries to the energy transformation sector and the energy industries themselves, that is, for example, the energy 'lost' during the transformation of fossil energy carriers such as oil and gas into the electricity that is eventually delivered to the consumer.

Environmental management systems

EMAS registrations doubled in the EU between 2004 and 2012. Southern European countries were the main contributors to this trend

Figure 2.16: Organisations and sites with EMAS registration, EU-27
(Number)

Source: EU Commission, DG Environment (online data code: tsdpc410)

The Eco-Management and Audit Scheme (EMAS) is a voluntary tool for organisations to report and improve their environmental performance.

The number of organisations with an environmental management system, according to the 'Eco-Management and Audit Scheme' (EMAS) regulation in the EU ([64]), has increased significantly over the past years. This trend indicates rising interest from companies, public authorities and other organisations in environmental management systems. Registrations in the EU have increased by 4 % on average per year, whereas the number of sites with an environmental management system according to the EMAS regulation has grown by 9 % per year. The highest increase in EMAS registrations by organisations was observed in 2007 (11.4 %). Participation by EU organisations continued to increase after this, but at a diminishing rate, until 2010, when the trend was reversed. In fact, the number of EMAS registered sites declined by 1.5 % between 2010 and 2012, suggesting that the number of companies withdrawing from EMAS outstripped a recent surge in uptake in mostly southern European countries.

The uptake of environmental management systems across Europe is in line with the wider effort at EU and Member State level to promote greater commitment to corporate social responsibility (CSR) among enterprises.

([64]) Regulation (EC) No 1221/2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS)

Box 2.8: A series of instruments fostering EMAS at EU level

The EU has streamlined the wider endorsement of EMAS, in particular through a number of initiatives. These comprise among others the promotion of awareness-raising activities among organisations, stakeholders and the general public and the introduction of co-funding schemes for innovative EMAS projects through the Financial Instrument for the Environment (LIFE) Programme. Efforts have also been made to integrate EMAS into other EU (environmental) policies and legislations such as the Directive on Eco-design of Energy Using Products ([65]), the Directive on Waste Electrical and Electronic Equipment ([66]), the Public Procurement Directives ([67]) and others. In agreement with the principles of sustainable development that it promotes, the European Commission also decided to apply the EMAS Regulation into its own activities, thus setting an example for other organisations to follow ([68]).

To further increase EMAS adoption among organisations, the European Commission set out a working plan to identifying sector-specific best practices and benchmarks as well as indicators ([69]). This tailored sector-specific approach helps and guides EMAS companies in a specific sector, contributing to a harmonised and enhanced application of the EMAS Regulation ([70]).

How registration of environmental management systems varies between Member States

A core group of EMAS front runner countries have mainly driven the trend in EMAS registrations. Germany, Italy and Spain have an exceptionally high total number of registrations. The uptake, expressed as numbers of EMAS registered organisations per million inhabitants (2013 data), in Cyprus (59.2), Austria (30.4), Spain (22.5), Italy (18.5), Germany (14.9) and Denmark (11.1) is impressive ([71]). A number of Member States with very high EMAS registrations, corresponding to their long-standing tradition voluntary environmental management systems, have, however, recorded considerable declines in their uptake from 2003 to 2012. The rates of decline in these countries ranged from 46 % for Denmark and 44 % for Sweden to 34 % for Germany and 14 % for Austria.

A partial explanation for this might be that long-term EMAS registrants face difficulties in meeting the ongoing demand for improvements in environmental performance, as required by the scheme. On the other hand companies that have just introduced the scheme still have considerable potential for improvement ([72]). However, this decline happened against the backdrop of a promising upward trend in the number of EMAS registrations in a few Southern European countries, namely Italy (+ 581 %), Portugal (+ 425 %), Greece (+ 389 %) and Spain (+ 302 %).

What lies beneath this indicator?

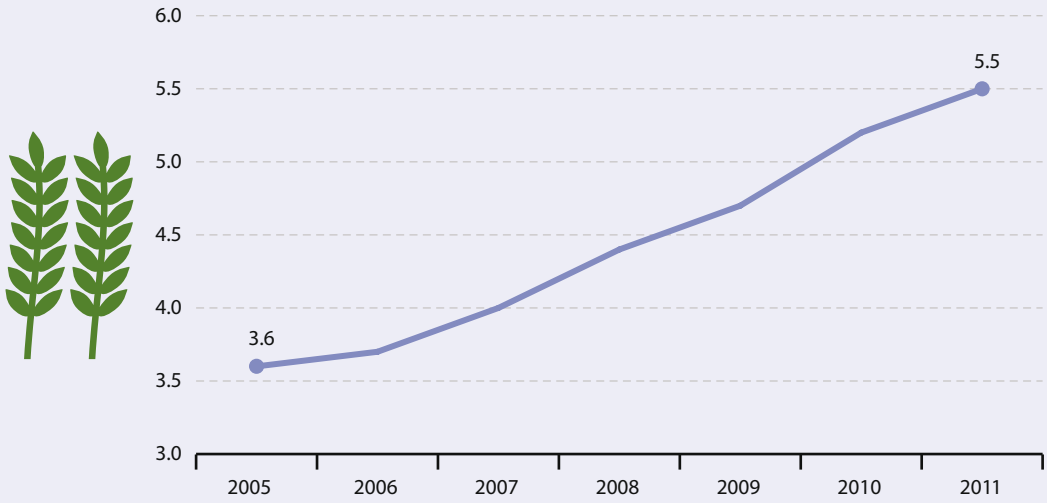
By improving their environmental performance, for example by enhancing energy and resource efficiency, European companies and public organisations can take proactive action to overcome pressing environmental challenges. EMAS and similar environmental management schemes are also beneficial for the companies themselves as they allow them to monitor their resource use via environmental performance indicators, acquire public recognition and improve their reputation. Furthermore, EMAS enables companies to gain a competitive advantage by achieving cost reductions and demonstrating their serious commitment to reducing the environmental impacts of their operations. The indicator measures the number of companies registered for EMAS.

([65]) Energy Using Products Directive 2005/32/EC
([66]) Waste Electrical and Electronic Equipment Directive 2002/96/EC
([67]) Directive 2004/17/EC and 2004/18/EC
([68]) EMAS website — http://ec.europa.eu/environment/emas/emas_ec/index_en.htm
([69]) EMAS website — http://ec.europa.eu/environment/emas/documents/sectoral_en.html
([70]) European Commission, *Establishment of the working plan setting out an indicative list of sectors for the adoption of sectoral and cross-sectoral reference documents*, under Regulation (EC) No 1221/2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS). 2011/C 358/02. p. 1.
([71]) http://ec.europa.eu/environment/emas/documents/articles_en.htm
([72]) Milieu Ltd and Risk policy Analysis Ltd -Final Report: Study of the Costs and Benefits of EMAS to Registered Organizations, 2009, p. 62.

Organic farming

More than 50 % increase in organic farming in the EU between 2005 and 2011. The steep increase is supported by a series of agri-environmental measures varying between EU Member States

Figure 2.17: Area under organic farming, EU-27
(% of utilised agricultural area)



NB: Eurostat estimates

Source: Eurostat (online data code: tsdpc440)

The agricultural area under organic cultivation in the EU increased continuously by 1.9 percentage points during the period 2005 to 2011. This dynamic development was also reflected in the considerable growth of sales of organic products on the EU food market, which reached EUR 19 600 million in 2010 compared with EUR 16 000 million in 2007 ([73]).

Box 2.9: New European policy initiatives contributing to organic farming

Under the Europe 2020 Strategy the European Commission proposed two initiatives targeting greater and more sustainable use of renewable resources.

The Commission's strategy and action plan, 'Innovating for Sustainable Growth: a Bioeconomy for Europe' ([74]) reconciles demands for sustainable agriculture and fisheries, food security and the sustainable use of renewable biological resources for industrial purposes, while ensuring biodiversity and environmental protection.

The 'European Innovation Partnership on Agricultural Productivity and Sustainability' ([75]) for the period from 2014 to 2020 aims to improve sustainability and resource efficiency (for example inputs of water, energy, fertilisers and pesticides) and addresses environmental issues (such as biodiversity loss).

The European Action Plan for Organic Food and Farming establishes 21 initiatives for supporting the development of the organic market and improving standards by enhancing efficacy, transparency and consumer confidence. Some of the policy measures put forward by the European Commission as part of this plan include 'improving information about organic farming, streamlining public support via rural development, improving production standards or strengthening research' ([76])([77]).

([73]) Organic Europe, European section of the organic world website: http://www.organic-europe.net/1737.html?&L=0
([74]) European Commission, 2012, *Innovating for Sustainable Growth: A Bioeconomy for Europe*, COM(2012) 60 final.
([75]) European Commission, 2012. *European Innovation Partnership 'Agricultural Productivity and Sustainability'*. COM(2012) 79 final.
([76]) European Commission Agriculture and Rural Development website: http://ec.europa.eu/agriculture/organic/eu-policy/action-plan_en
([77]) Further details about the Action Plan could be found in the following documents: Official Communication from the Commission to the Council and the European Parliament and Commission staff working document.

How organic farming varies between Member States

The distribution of organic farmland in the EU does not seem to have changed greatly since 2005. The highest share of organic agricultural land in 2011 was still held by Austria (19.6 %), followed by Sweden (15.7 %), Estonia (14.1 %) and the Czech Republic (13.1 %). Similarly, Malta and Bulgaria remained the countries with the smallest hectares of agricultural land managed organically, with only 0.2 % and 0.5 %, respectively. However, the speed of growth in the organic agricultural sector in the period 2005 to 2011 differed tremendously across countries.

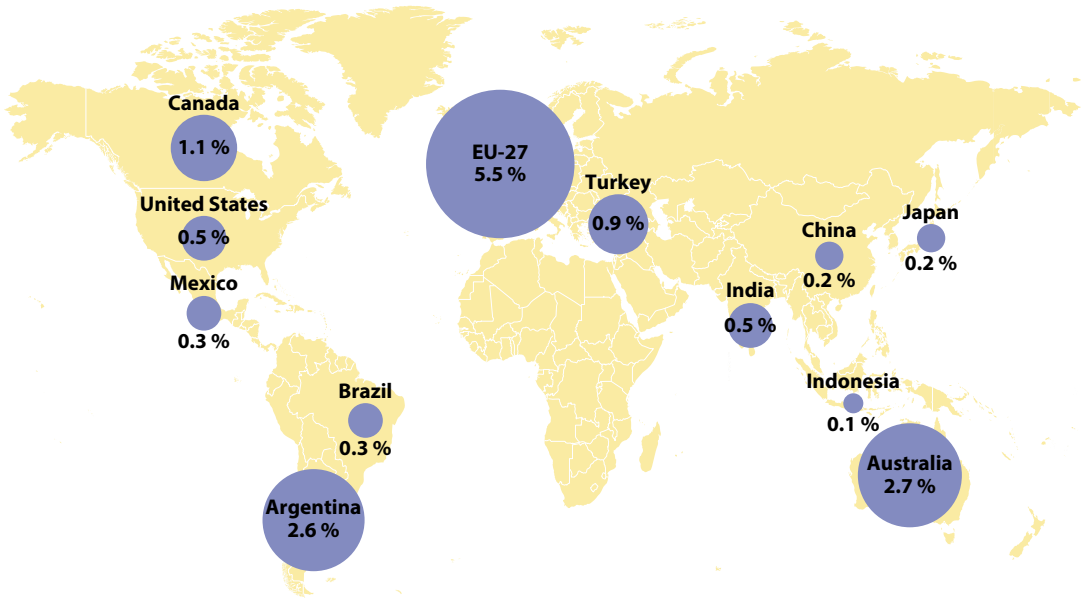
Countries that experienced the fastest uptake of organic farming during this period were Poland, Bulgaria (although starting from an exceptionally low level of 0.2 %) and Belgium, increasing by 1.5 to more than four times (Poland) between 2005 and 2011. The large disparities in the scale and development of organic farming between Member States are likely to be influenced by differences in subsidies for organic production. For example, between 2004 and 2005 46 % of the organic area in the EU benefitted from organic-specific support provided with agri-environmental measures. However, this varied greatly between Member States with more than 90 % in Finland and less than 10 % in the UK ([78]).

Barriers and incentives for organic farming

A number of factors may be holding the development of organic farming back in some countries. These include difficulty achieving high enough prices due to lack of demand, short-term surpluses of some products (such as a glut of organic milk in some Member States in 2000) or supply chain and institutional bottlenecks for organic producers ([79]). The EU has created a broad framework to help organic farming grow across Europe.

EU trends in organic farming compared with other countries in the world

Figure 2.18: Certified organic agricultural area in the EU-27 and in other G-20 countries, 2011
(% of total agricultural area)



NB: 2003 data (instead of 2011) for AUS, JP; 2004 data (instead of 2011) for Republic of Korea, 2005 data (instead of 2011) for US; 2006 data (instead of 2011) for Mexico; 2011 data for EU-27

Source: FAO; Eurostat (online data code: tsdpc440)

([78]) European Commission Directorate General for Agriculture and Rural Development, *An Analysis of the EU Organic Sector*, 2010, p. 3.
([79]) Ibid, p. 18–19.

At the international level the EU is among the world leaders with regard to organic farming. It outperforms by far a number of G20 countries such as the United States, Argentina or Australia. Whereas Australia and Argentina account for the highest share among G20 countries with 2.7 % and 2.6 %, the United States has only 0.5 % of its agricultural area under organic production ([80]). A substantial driving force behind the dynamic expansion of the organic farming sector in Europe is its long-standing history and extensive application of an EU-level legal framework for production, distribution, control and labelling of organic products ([81]).

What lies beneath this indicator?

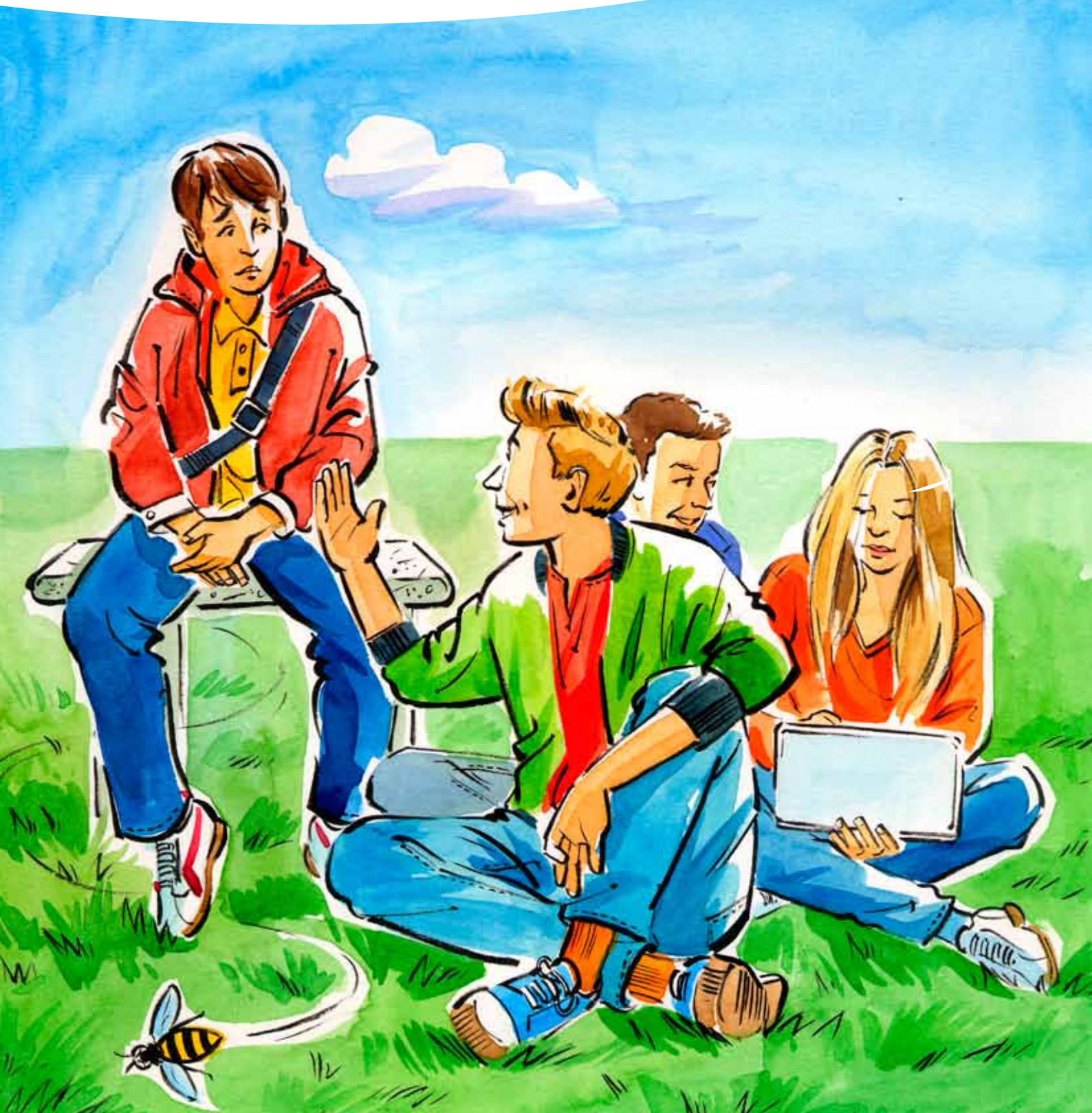
Organic farming is a method of production that contributes to the protection of natural resource and biodiversity by prohibiting or restricting the use of chemical-synthetic pesticides, chemical fertilisers, growth hormones, antibiotics and genetic modifications ([82]). Compared to conventional agricultural practices it enhances soil health and natural fertility and reduces energy and water input while maintaining a comparable level of productivity ([83]). In addition, organic farming promotes animal welfare and health by strictly regulating the use of feed and using production methods that meet the specific behavioural needs of animals. The high-labour intensiveness of organic production also contributes to the economic and social development of many rural communities by creating jobs ([84]). Last but not least, organic production helps to meet the growing demand of EU consumers for high-quality, natural and healthy products.

The indicator measures the share of total utilised agricultural area (UAA) occupied by organic farming (existing organically farmed areas and areas in the process of conversion).

([80]) Data retrieved from FAO: http://faostat.fao.org/site/377/DesktopDefault.aspx?PageID=377#ancor ; 8.7.2013
([81]) Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and its implementing Regulations, Commission Regulations (EC) No 889/2008 and (EC) No 1235/2008
([82]) European Commission Agriculture and Rural Development, *Organic Farming: A Guide for Stakeholders, Farmers, Processors and Distributors*.
([83]) Pimentel, D., Hepperly, P., Hanson, J., Seidel, R. and Douds, D., 2005, *Organic and Conventional Farming Systems: Environmental and Economic Issues*. p. 26–27.
([84]) http://ec.europa.eu/agriculture/organic/home_en

3

Social inclusion



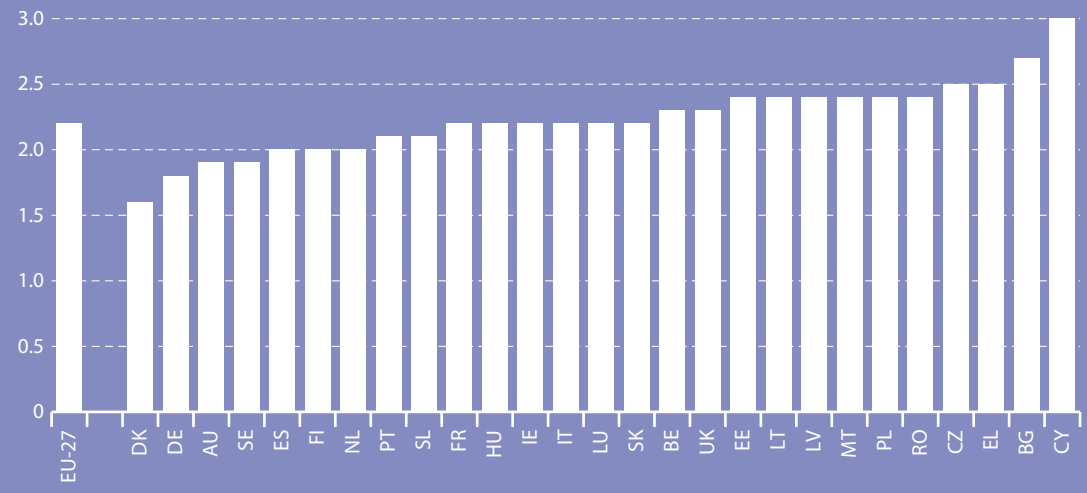
Social inclusion seen through the lens of Quality of Life

Social exclusion and deprivation do not confine to income poverty

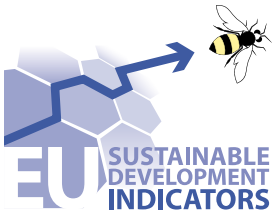
The index of perceived social exclusion included in the European Quality of Life Survey (EQLS) provides an overall measure of social exclusion, by taking into account a variety of relevant issues such as the sense of connectedness, recognition of one's activities and barriers to participation in wider society.

Based on the index in 2011 the countries with the lowest level of perceived social exclusion were Denmark, Germany, Austria and Sweden. Highest perceived social exclusion was reported in Cyprus, Bulgaria, the Czech Republic and Greece. Poverty and social exclusion seem to be closely linked as most of the countries scoring low on the subjective indicator of social exclusion are also at the lowest rank in terms of the objective measure of at risk of poverty and exclusion and vice versa. However, there are a number of unusual cases such as the Czech Republic, which, having the second lowest at risk of poverty rate in the EU, still ranks third in terms of high perceived social exclusion.

Index of perceived social exclusion, by country, 2011
(mean of scores, scale 1–10)



Source: European Quality of Life Survey



Overview of main changes

The economic crisis has influenced many of the indicators in the social inclusion theme. Trends have deteriorated in the short term, in particular after 2009, with an increasing number of people being affected by one or more forms of poverty as covered by the headline indicator 'risk of poverty or social exclusion', namely monetary poverty, severe material deprivation, and low work intensity. The same is true for long-term unemployment. In contrast, trends have been favourable for most of the education indicators, in particular early school leavers and tertiary education. However, trends in adult education, as monitored through participation in lifelong learning, are less encouraging.

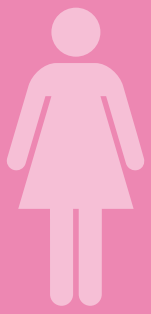
Table 3.1: Evaluation of changes in the social inclusion theme (EU-27, from 2000) (1)

Level 1	Level 2	Level 3
Risk of poverty or social exclusion (*)	**Monetary poverty and living conditions**	
	Risk of poverty after social transfers (*)	Income inequalities (**)
	Severe material deprivation (*)	
	Access to labour market	
	Very low work intensity (*)	Long-term unemployment
		Gender pay gap (***)
	Education	
	Early school leavers (****)	Adults with low educational attainment
	Tertiary education	Lifelong learning (****)

(*) From 2008. (**) From 2005. (***) From 2006. (****) From 2003.

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.

Gender inequalities and sustainable development



'Gender equality and women's empowerment are important for sustainable development and our common future' ([2]). This statement from the outcome document of the Rio+20 conference held in June 2012 in Rio de Janeiro makes it clear that reducing inequalities, in particular between the sexes, is one of the main challenges of the sustainable development agenda. The major differences between the sexes observed in the indicators analysed in this report are briefly summarised below.

Employment

Women are still less economically active than men. While in 2012 almost two-thirds of men (74.6 %) were employed, the rate was much lower for women, at 62.4 %. The gap was slightly larger for older workers in the 55 to 64 age group. Variations in regional employment among women exceed those of men five-fold. Nevertheless, the gender employment gap in the EU has reduced substantially over the past decade. This trend also occurred during the economic crisis, when men were more affected by its impacts on the labour market than women.

Duration of working life

In 2011, men on average worked 5.5 years longer than women over their lifetime. However, a convergence in the duration of working life between the sexes is visible, mainly due to the continuous increase in the working life of women.

Long-term unemployment

During the early part of the last decade, long-term unemployment was slightly higher for women, regardless of their age. The rates have assimilated since then. Among the young, more men than women are affected, which can be explained by a higher proportion of male early school leavers.

Early leavers from education and training

In 2012, 14.5 % of boys left school with at most lower secondary education, whereas the girls' share of early school leavers was 11.0 %. Overall, girls were more likely to reach upper secondary education.

Tertiary educational attainment

In 2012 women had already achieved the Europe 2020 strategy's target for this indicator, with a tertiary education rate of 40 %, as compared to 31.6 % for men. Between 2000 and 2012 the increase in tertiary education was almost twice as fast for women as for men. By 2012, women significantly outnumbered men in terms of tertiary educational attainment in all Member States except for Luxembourg.

Low educational attainment

In 2012, 16.6 % of women aged 25 to 34 had low educational attainment. The share of men in the same age group with low levels of education was higher, at 20.4 %. On the contrary, in the age groups of 45 to 54 year olds and above, low educational attainment was more widespread among women than men.

Lifelong learning

In 2012, the share of women participating in lifelong learning was higher than the respective share of men (9.7 % as opposed to 8.4 %). This gender difference is observable for the whole period 2000 to 2012.

([2]) UN GA, *The future we want*, A/RES/66/288, 2012 (para 31).

Tensions within society

Regarding perceived tensions between men and women, the European Quality of Life Survey (EQLS) suggests that the level of these tensions as seen by respondents is relatively low. Nevertheless, fewer women have responded that there is no tension at all (32 %) than men (41 %). On average, the share of respondents reporting a lot of tensions between men and women in the EU Member States has been 10 %. Countries with a share of respondents reporting a lot of tensions being above average were Cyprus (30 %), Greece (18 %), Hungary (16 %) and Luxembourg (16 %).

Life expectancy

In 2011 life expectancy at birth was 5.5 years higher for women than men. For the age group 65 this gap was 3.5 years. In contrast, the gap in expected healthy life years at birth between men and women remained almost negligible, at 0.4 years. Although life expectancy for both sexes has increased since 2004, improvements in overall life expectancy for women did not lead to a higher number of healthy life years but to a higher number of years with a disability or disease. While between 2005 and 2011 the number of healthy life years remained stable for men aged 65, it decreased for women by 0.3 years.

Death due to chronic diseases

Men are much more likely to die of a chronic disease than women. In 2009 about 80 out of 100 000 women and about 150 out of 100 000 men aged less than 65 died of a chronic disease. However, the average decrease per year between 2000 and 2009 was considerably higher for men (2.4 %) than for women (1.9 %), suggesting a gender convergence of the death rates.

Suicide death rate

Suicide is nearly four times more common among men than among women. However, the gap between men and women is slowly closing. Most of this closing took place between 2000 and 2007, a period of decline of the death rate among men. After 2007, however, suicide deaths started to increase among men.

Why do we deal with social inclusion?

In line with the sustainable development agenda, the European Union aims to actively include every citizen, notably the most disadvantaged, fully in society, including in work. Active inclusion is intended to tackle various challenges: poverty, social exclusion, labour market segregation, long-term unemployment and gender inequalities. Thus in the EU the poverty and social inclusion concepts are closely interlinked.

On global level in 1997, the General Assembly of the United Nations decided poverty eradication should be an overriding theme of sustainable development. Agenda 21 ([3]) emphasised that poverty is a multidimensional problem, to which no uniform solution can be found. Chapter II of the Johannesburg Plan of Implementation ([4]) stressed, that poverty eradication is the greatest global challenge and an indispensable requirement for sustainable development ([5]).

Poverty has many facets. Extreme income poverty, which is defined by the World Bank as living on less than US$ 1.25 per day, occurs mostly in developing countries ([6]). Nevertheless, monetary poverty is a problem that also affects the EU. A substantial proportion of the population in the EU is at risk of poverty and social exclusion, but not all are affected in the same way. Some are on a low income compared with other residents in the same country, but this does not necessarily imply a low standard of living. Social transfers help a subpart of this group achieve an income above the poverty threshold. Another form of poverty is material deprivation. Those affected cannot pay unexpected expenses or afford some items considered to be desirable or necessary to lead an adequate life. Reducing inequalities between the highest and the lowest incomes contributes to the Sustainable Development Strategy's goal of achieving a high level of social cohesion. There are not only inequalities between the highest and lowest incomes, but also between the earnings of men and women. Income status and education level are closely linked. Tertiary education and participation in lifelong learning are preconditions for people to escape long-term unemployment by helping them to succeed in the labour market. Early school leavers and adults with low educational attainment are more likely to experience low work intensity or be among the working poor.

Social inclusion also links to the wider theme of socioeconomic development. Poverty and unemployment represent a non-realisation of human capital and thereby a social and economic loss to society. Furthermore, a possible gender pay gap reduces work and education incentives for women, with negative effects on overall economic performance. Better educated people have more potential to contribute to the economy. In turn, a well-performing economy and good labour market performance fosters employment, decreases monetary poverty and strengthens social inclusion. A strong economy also has more resources for social transfers to help people who still live in poverty. Poverty and unemployment affect people's health and are thus a challenge for the national budgets.

([3]) Agenda 21 is an action plan to be taken globally, nationally and locally by organisations of the United Nations System, Governments and Major Groups. Agenda 21, the Rio Declaration on Environment and Development, and the Statement of principles for the Sustainable Management of Forests were adopted by more than 178 Governments at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in June 1992.

([4]) The full implementation of Agenda 21, the Programme for Further Implementation of Agenda 21 and the Commitments to the Rio principles, were reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa from 26 August to 4 September 2002.

([5]) United Nations Department of Economic and Social Affairs, Division for Sustainable Development

([6]) Extreme poverty is not only restricted to developing countries, it also affects specific population subgroups in the EU, for example Roma. Further information on the situation of Roma is provided in Box 3.4.

How does the EU tackle social inclusion?

The EU Sustainable Development Strategy (EU SDS) ([7]) dedicates one of its seven key challenges to social inclusion, demography and migration, with the overall objective of 'creating a socially inclusive society' and 'to secure and increase the quality of life of citizens'. Its operational objectives and targets include:

- Pursuing the EU objective of taking steps to decisively reduce the number of people at risk of poverty and social exclusion by 2010 with a special focus on reducing child poverty.
- Ensuring a high level of social and territorial cohesion at EU level and in Member States as well as respect for cultural diversity.

One of the five targets of the Europe 2020 strategy ([8]) aims at fighting poverty and social exclusion:

- 'At least 20 million fewer people in or at risk of poverty and social exclusion'.

Through two of the seven flagship initiatives of the Europe 2020 strategy, the EU will boost inclusive growth:

- The 'European platform against poverty and social exclusion' ensures economic, social and territorial cohesion. It guarantees respect for the fundamental rights of people in experiencing poverty and social exclusion, and mobilises support to help people integrate in the communities where they live.
- The 'Agenda for new skills and jobs' helps people to acquire new skills, adapt to a changing labour market and make successful career shifts. The initiative also modernises labour markets to raise employment levels, reduce unemployment, raise labour productivity and ensure the sustainability of the EU's social models.

Further reading on social inclusion

European Commission, *The European Platform against Poverty and Social Exclusion: A European framework for social and territorial cohesion — 2010*, Brussels, COM(2010) 758 final

European Commission, *The social dimension of the Europe 2020 Strategy: A report of the Social Protection Committee — 2011*, Luxembourg, Publications Office of the European Union

European Commission, *Social Europe: Current challenges and the way forward. Annual Report of the Social Protection Committee — 2012*, Publications Office of the European Union, 2013, Luxembourg

Eurofound (2012), *Third European Quality of Life Survey — Quality of life in Europe: Impacts of the crisis — 2012*, Publications Office for the European Union, Luxembourg

Eurostat, *Smarter, greener, more inclusive? — Indicators to support the Europe 2020 strategy*, Luxembourg, Publications Office of the European Union, 2013

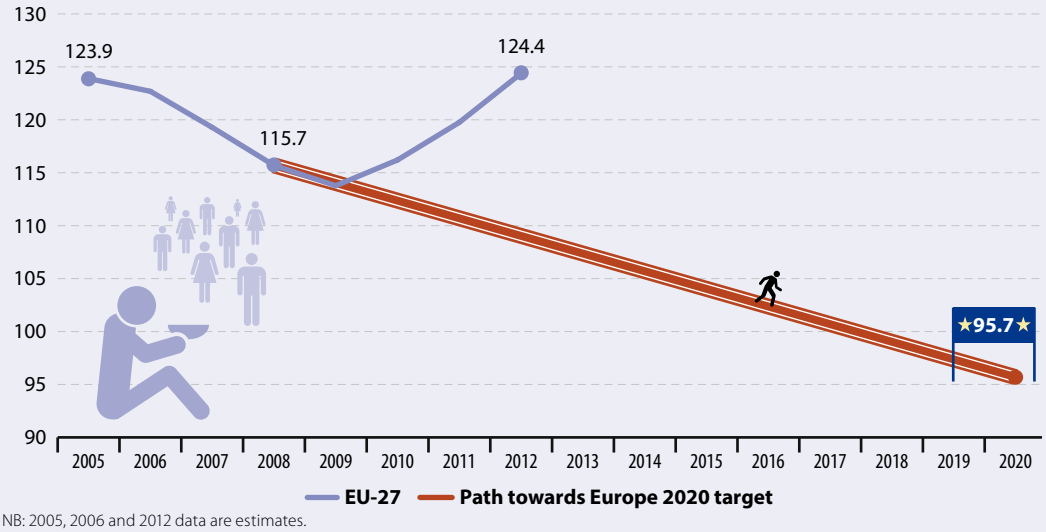
OECD Economics Department Working Papers, *Income Inequality in the European Union — 2012*, No. 952, OECD Publishing

([7]) Council of the European Union, *2009 Review of the EU Sustainable Development Strategy — Presidency report*, 16818/09.
([8]) Commission Communication, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final.

Risk of poverty or social exclusion

8.7 million more people were at risk of poverty or social exclusion in the EU between 2008 and 2012. Impacts of the economic crises have deflected the EU from its 2020 target path

Figure 3.1: People at risk of poverty or social exclusion, EU-27 (million people)



NB: 2005, 2006 and 2012 data are estimates.

Source: Eurostat (online data code: tsdsc100)

Measuring poverty and social exclusion requires a multidimensional approach. Household income is a key determinant of living standards, but other aspects preventing full participation in society such as access to labour markets and material deprivation also need to be considered. Therefore, the European Commission adopted a broad 'At-risk-of-poverty or social exclusion' indicator to serve the purposes of the Europe 2020 strategy. It measures three forms of poverty: monetary poverty, severe material deprivation and lack of access to jobs

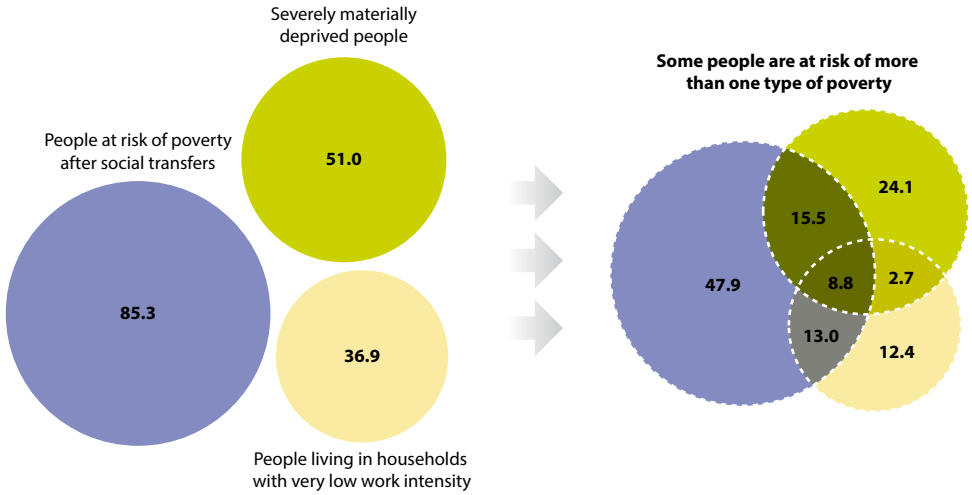
Between 2008 and 2012 the number of people at risk of poverty or social exclusion increased considerably by about 7.5 %, from 115.7 million in 2008 to 124.4 million in 2012. In the period before the economic crisis, this number had been steadily decreasing, reaching a minimum of 113.7 million in 2009 ([9]). Since then, in the aftermath of the crisis, the number has grown again.

The 124.4 million people being at risk of poverty or social exclusion in 2012 included 85.3 million people being at risk of monetary poverty, 51.0 million people affected by severe material deprivation, and 36.9 million people living in households with very low work intensity. As shown in Figure 3.2, people are only counted once even if they are present in more than one sub-indicator. As such, it becomes clear that out of the 51.0 million people that were living in severely materially deprived circumstances in 2012, more than half were at the same time affected by one or both of the other two forms of poverty covered by the headline indicator. Some 8.8 million people had to deal with all three poverty dimensions — monetary poverty, severe material deprivation, and very low work intensity — at the same time in 2012 and could thus be considered as the group being 'worst off'.

The three sub-indicators showed slightly different trends over the past few years, thus contributing to varying degrees to the changes in the overall 'people at risk of poverty or social exclusion' headline indicator. The sub-indicators and their trends are analysed in more detail in the following sections in this chapter.

([9]) The income reference period in EU-SILC is a fixed 12-month period (such as the previous calendar or tax year) for all countries except the United Kingdom for which the income reference period is the current year and Ireland for which the survey is continuous and income is collected for the past 12 months. As a consequence, some of the income-related indicators in this chapter might only mirror the impacts of the economic crisis with a time-lag of one year, i.e. the contraction of GDP by 4.8 % in 2009 is only visible here from 2010 on.

Figure 3.2: Aggregation of sub-indicators of 'People at risk of poverty or social exclusion', EU-27, 2012
(million people)



NB: Estimated data; the overall number of people at risk of poverty in the EU was 124.4 million.

Source: Eurostat (online data codes: ilc_pees01, tsdsc270, tsdsc280 and tsdsc310)

A fourth of the EU population at risk of poverty or social exclusion — a serious challenge to social Europe

Distance to the Europe 2020 target on fighting poverty and social exclusion is growing

Despite the cushioning role of automatic stabilisers and other measures to limit the negative social effects of the recession, compared with the base year for the Europe 2020 strategy's poverty target — 2008 ([10]) — the number of people at risk of poverty or social exclusion has risen by 8.7 million by 2012. This jeopardises the achievement of the Europe 2020 strategy's headline target for alleviating poverty, which aims to lift at least 20 million people out of the risk of poverty and social exclusion by 2020. Based on 2012 data, almost 29 million people would need to be lifted out of the risk of poverty and social exclusion during the next eight years to meet the target.

Overall 25 % of the EU population in 2012 experienced at least one form of poverty covered by the headline indicator 'risk of poverty or social exclusion'. Thus, the current economic circumstances pose a significant challenge to policy makers for improving the situation of EU citizens at risk of poverty. Fighting poverty and ensuring social inclusion may prove particularly difficult at a time of recession or slow economic recovery and extensive fiscal consolidation programmes, which strain government budgets for social protection all across Europe.

([10]) Due to the structure of the survey on which most of the key social data is based (i.e. EU-SILC), a large part of the main social indicators available in 2010, when the Europe 2020 Strategy was adopted, referred to 2008 as the most recent year of data available. This is the reason why monitoring of progress takes 2008 as a baseline year (see European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Social Europe — Current challenges and the way forward. Annual Report of the Social Protection Committee (2012)*, Luxembourg: Publications Office of the European Union, 2013).

Box 3.1: EU strategies on active inclusion

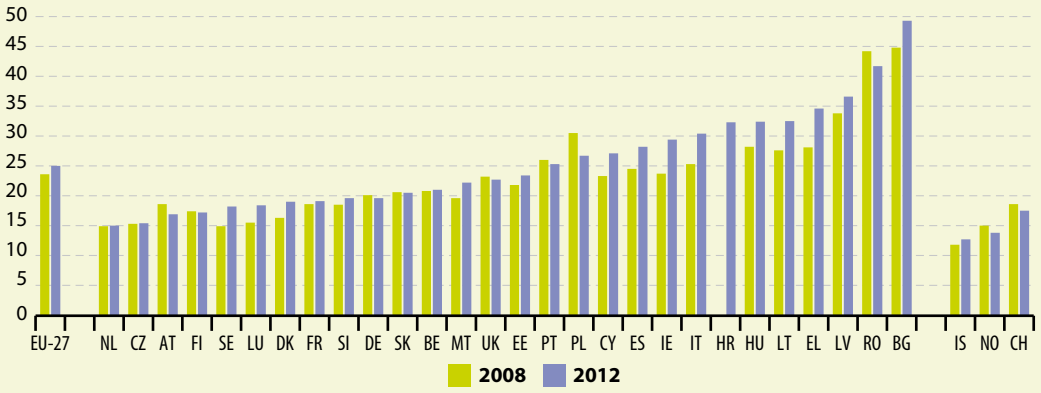
To address current challenges the European Commission has called on Member States to prioritise social investment and modernise their welfare states. This means better performing active inclusion strategies and a more efficient and effective use of social budgets. The EU Social Investment Package ([11]) is an integrated policy framework that takes account of the social, economic and budgetary divergences between Member States. It focuses on:

- Ensuring that social protection systems respond to people's needs at critical moments throughout their lives.
- Simplified and better targeted social policies, to provide adequate and sustainable social protection systems.
- Upgrading active inclusion strategies in the Member States.

How the number of people at risk of poverty or social exclusion varies between Member States

In 2012, the share of people at risk of poverty or social inclusion at the Member State level ranged from 15.0 % in the Netherlands to 49.3 % in Bulgaria. In 2008, the variation had been slightly smaller, ranging from 14.9 % to 44.8 %. The disparities in poverty rates across the EU have been partially influenced by the extent to which different economies have been affected by the recent economic crisis, but also by differences in the structure of labour markets, welfare systems, fiscal position and fiscal consolidation measures of individual Member States ([12]).

Figure 3.3: People at risk of poverty or social exclusion, by country
(% of population)



NB: 2011 data (instead of 2012) for BE, IE, AT and UK; 2012 data are estimates (EU-27) or provisional (IT); break in series for LV (2011).

Source: Eurostat (online data code: tsdsc100)

([11]) European Commission, *Towards Social Investment for Growth and Cohesion — including implementing the European Social Fund 2014–2020*, (COM)2013 83 final.
([12]) European Commission, *Social Europe: Current Challenges and the Way Forward. Annual Report of the Social Protection Committee*, 2012, (p. 18).

The proportion of people affected by all three poverty dimensions has declined in only a few Member States

In 22 Member States the proportion of the population affected by all three forms of poverty at the same time — monetary poverty, severe material deprivation and low-work intensity — did not improve between 2008 and 2012. In the remaining six countries (the Czech Republic, Germany, the Netherlands, Austria, Poland and Romania) the share of the people who were 'worst-off' decreased. It is interesting that while in four cases this improvement went hand in hand with a decline in the overall share of people at risk of poverty or social exclusion, there was a divergence in the trend in the Czech Republic and the Netherlands. While the share of people at risk of poverty or social exclusion in these two countries slightly increased between 2008 and 2012, fewer people were suffering from all three forms of poverty at the same time in 2012 compared with 2008.

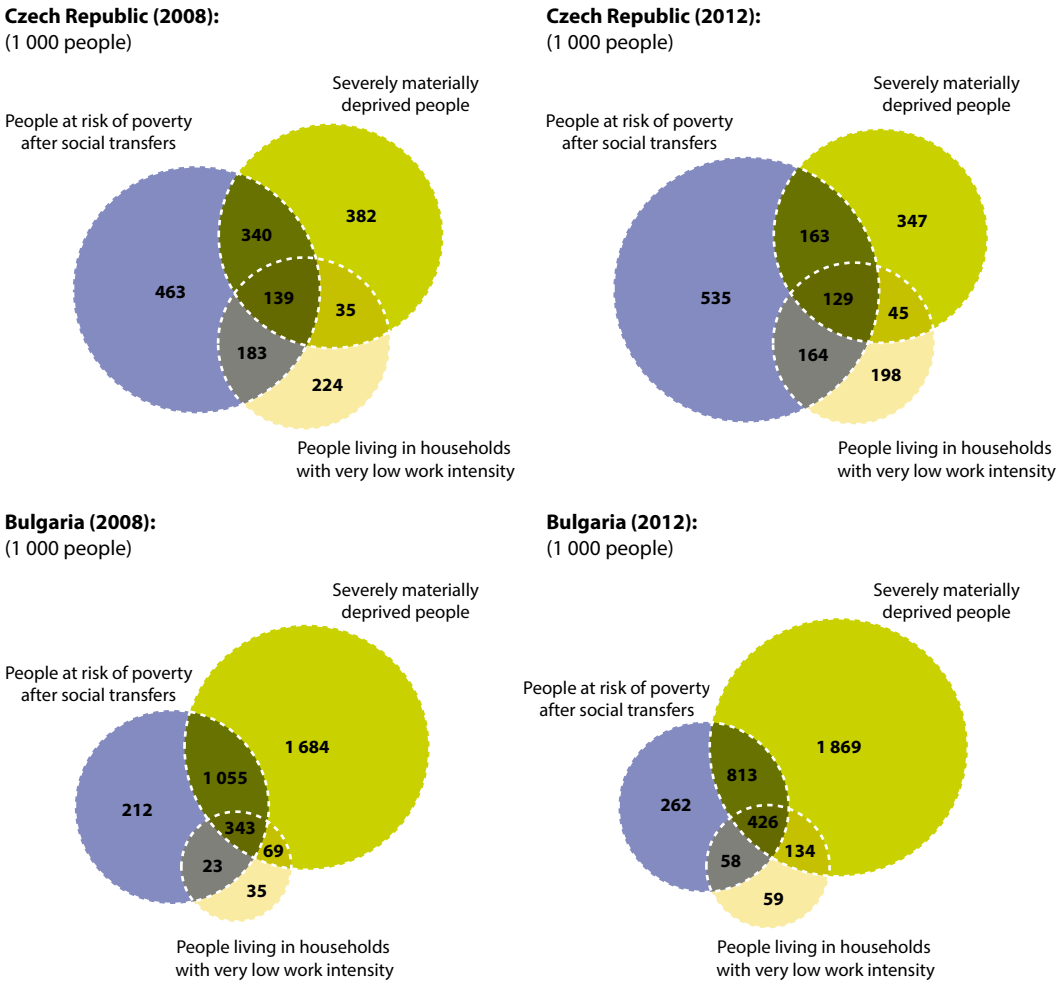
Huge variation in relation to the predominant dimension of poverty across the Member States — examples from the Czech Republic and Bulgaria

Differences in the most dominant forms of poverty across the EU are exemplified by the situation in the Czech Republic and Bulgaria (see Figure 3.4). Both countries joined the EU in the 2000s, but their situation concerning poverty or social exclusion is quite different: one is among the best performing countries in the EU, whereas the other shows the highest levels of risk of poverty or social exclusion (almost half of the population was affected in 2012).

The slight increase in the number of people at risk of poverty or social exclusion in the Czech Republic between 2008 and 2012 was solely driven by the expansion of monetary poverty. This was not only the most prevalent dimension, it was also the only dimension to increase between 2008 and 2012 (by 7 %). In contrast, the share of people in deprived circumstances or low work intensity fell by 1.9 % and 7.7 % respectively over the same period. Against the background of these divergent developments in the different poverty indicators, the most disadvantaged group — those affected by all three forms of poverty — was reduced by 7.2 %.

In 2012 Bulgaria continued to have the highest at-risk-of-poverty or social exclusion rate in the EU, with the most widespread form of poverty being severe material deprivation. Between 2008 and 2012, the situation of the most marginalised members of society deteriorated, with the share of those suffering from all three forms of poverty increasing by 24 %. This negative trend occurred against the background of an overall expansion of the risk of poverty and social exclusion among the population. In 2012, an additional 200 000 people were affected by at least one of the three dimensions of poverty compared to 2008. The deterioration in the headline indicator can mainly be traced back to the increase in low work intensity and material deprivation during that period, whereas monetary poverty showed a reduction.

Figure 3.4: Aggregation of sub-indicators of 'People at risk of poverty or social exclusion'
(1 000 people)



Source: Eurostat (online data codes: ilc_pees01, tsdsc270, tsdsc280 and tsdsc310)

The comparison between the Czech Republic and Bulgaria shows that the two countries differ not only in the total number of people affected by monetary poverty or social exclusion but also in the composition of the indicator. While in the Czech Republic most people are affected by monetary poverty only, in Bulgaria material deprivation (alone or in combination with monetary poverty) is the major issue. Also, the three dimension of poverty show quite divergent developments over time in these two countries. In the Czech Republic the increase in monetary poverty was accompanied by a reduction in material deprivation and low work intensity, while the trends were quite the opposite for Bulgaria. One possible explanation for this divergence is the nature of the indicators: while monetary poverty is measured in relative terms, in relation to the general standard of living and income in the country, material deprivation and low work intensity are absolute measures. Therefore, changes in monetary poverty might also be related to a shift in the national at-risk-of-poverty threshold.

Who is most at risk of poverty or social exclusion in the EU?

A closer look at the headline indicator 'people at risk of poverty or social exclusion' based on certain population characteristics sheds more light on the profile of poverty and identifies the most disadvantaged subgroups in society. Figure 3.5 compares the poverty status of 10 different population groups differentiated by activity, education level of parents, household type, citizenship, tenure status, country of birth, education, age, degree of urbanisation and sex.

In terms of activity status, **unemployed people** are at the highest at risk of poverty. In 2012 the number of people at risk of poverty or social exclusion among the unemployed (66.7 %) was more than four times higher than among the employed (13.6 %).

The lower the **educational status of parents**, the higher the risk of poverty for children tends to be. In 2012 more than half of the children whose parents had low educational attainment (pre-primary, primary and lower secondary education) were at risk of poverty or social exclusion (64.4 %), compared with only 10.3 % of the children with parents who had attained tertiary education.

Single parents with dependent children show the highest incidence of poverty compared to other household types. About 50.8 % of all single people with one or more dependent children were at risk of poverty or social exclusion in 2012. This was double the average and higher than in any other household type or group analysed. The group with the lowest poverty rate in 2012, which has also showed the most improvement since 2005, were households of two adults where at least one person was aged 65 years or over (27.4%).

Among adults with different **citizenship status**, citizens of non-EU-27 countries are exposed to the highest risk of poverty or social exclusion — 44.5 % compared to 37.7 % for citizens from foreign countries and 27.7 % for EU-27 citizens. Similarly, poverty levels are more prevalent among those born in a non-EU country (38.4 %) compared to those born in a foreign (32.9 %) or EU-27 country (23.8 %). A major problem for various groups of migrants that makes the issue of social exclusion more complex can be how they are accepted within societies with different religious and ethnic predominance. According to the European Quality of Life Survey (EQLS) from 2012, the most perceived type of social tensions in the EU were among different racial and ethnic groups. The countries where these tensions were most widely acknowledged were the Czech Republic (68 %) and Hungary (60 %), while in Lithuania and Estonia the perception of tensions between racial and ethnic groups was considered less relevant (both 16 %).

Based on **tenure status** poverty levels are highest for tenants renting at reduced prices or free, at 41.0 %, compared to 34.9 % of tenants renting at market prices and only 12.0 % for owners with a mortgage or a loan. This might be due to the fact that tenants paying reduced rent or enjoying rent-free accommodation are subject to housing allowances or subsidies based on their income level.

Risk of poverty also seems to be more prevalent **in less urbanised areas**. Some 27.2 % of the EU population living in thinly populated areas was subject to poverty or social exclusion in 2012, in contrast to 24.7 % for densely populated areas. The percentage of the population at risk of poverty and social exclusion in less urbanised regions was exceptionally high for Bulgaria (61.4 %), Romania (54.8 %) and Latvia (40.6 %). Bulgaria and Romania were also the Member States with the highest urban-rural disparity in poverty rates. In both countries the share of the population at risk of poverty in less urbanised areas was more than 20 percentage points higher than in more urbanised areas. For a number of countries, the concentration of people at risk of poverty is higher in more urbanised areas, namely the Netherlands, Austria, Belgium, UK, Luxemburg, France, Sweden and Iceland.

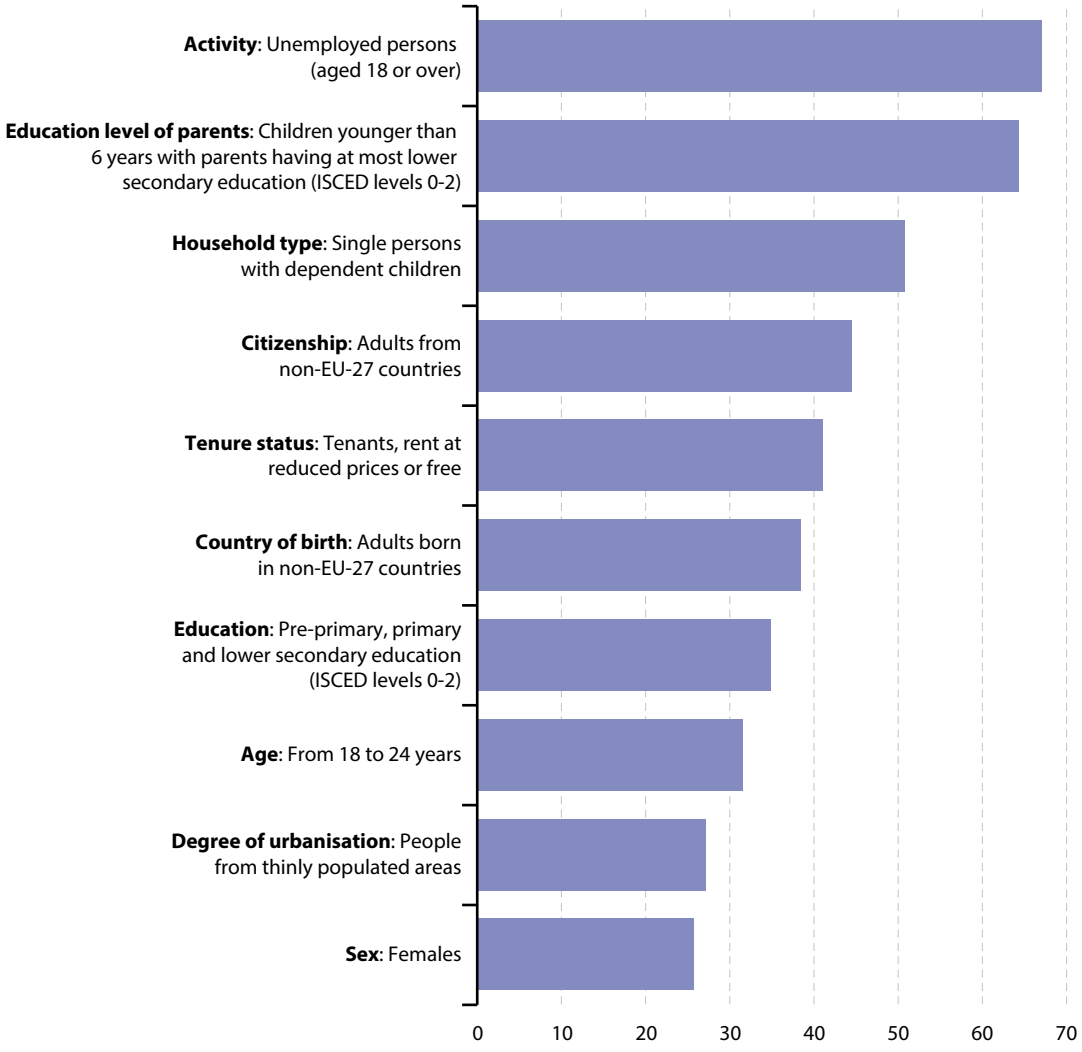
The incidence of poverty varies considerably among groups with different **educational level**. Some 34.9 % of people with a low educational attainment (pre-primary, primary and lower secondary education) were at risk of poverty or social exclusion in 2012. In comparison, 12.0 % of people with tertiary education were in the same situation, indicating that people with low educational attainment were almost three times more likely to be at risk of poverty or social exclusion than those with a higher education.

Women are more exposed to poverty than men

In terms of gender, females seem to be more exposed to poverty risk. More than 25.7 % of women were at risk of poverty or social exclusion across the EU in 2012, compared with 23.8 % of men. Across the EU, women were worse off in all countries except Estonia. The gaps were highest in Cyprus, Slovenia and Sweden, with a difference of more than 3.5 percentage points.

However, the disparities between women and men differ with respect to age groups. Among men, particularly the young have been heavily affected (30.6 % of men aged 18 to 24 have been at risk of poverty or social exclusion in 2012) while older men have been significantly less likely to live in poverty (16.2 % of men aged over 65 have been at risk of poverty in 2012). In contrast to that, women have been more likely to be at risk of poverty or social exclusion in all age groups. The risk of poverty or social exclusion has been most unequal in the older age groups above 65.

Figure 3.5: People most at risk of poverty or social exclusion, by sub-group, EU-27, 2012
(% of population)



NB: data for breakdowns by citizenship, tenure status, degree of urbanisation and education level of parents are estimates.

Source: Eurostat(online data codes: ilc_peps01, ilc_peps02, ilc_peps03, ilc_peps04, ilc_peps05, ilc_peps06, ilc_peps07, ilc_peps13 and ilc_peps60)

Box 3.2: What do we mean by 'social exclusion'?

The EU concept of poverty is very distinctive compared to the rest of the world because it goes hand in hand with the concept of social exclusion. Thus, when we talk about poverty in the EU we are concerned with issues that go beyond just income. Among others, these include lack of access to jobs, education and health care. With regard to issues such as social isolation, for instance, we are equally concerned with the way that damaged personal relationships can harm individual well-being.

Distinguishing the EU concept of poverty from the rest of the world, social exclusion is a very politically sensitive concept. Although the headline indicator 'People at risk of poverty or social exclusion' measures primarily economic shortages, in the general European political context social exclusion is perceived as a broader concept, encompassing a number of complex and multifaceted issues.

According to one working definition by the European Commission social exclusion can be described as 'a process whereby certain individuals are pushed to the edge of society and prevented from participating fully by virtue of their poverty, or lack of basic competencies and lifelong learning opportunities, or as a result of discrimination. This distances them from job, income and education and training opportunities, as well as social and community networks and activities. They have little access to power and decision-making bodies and thus often feel powerless and unable to take control over the decisions affecting their day-to-day lives' ([13]).

Another important definition of the concept is presented in the Commission's 1992 Communication 'Towards a Europe of solidarity', where social exclusion is described as the result of 'mechanisms whereby individuals and groups are excluded from taking part in the social exchanges, from the component practices and rights of social integration and of identity. Social exclusion goes beyond participation in working life; it is felt and shown in the fields of housing, education, health and access to services' ([14]).

It should be noted that the social inclusion chapter in this current publication is based on the wider concept of social exclusion, which is also used to frame the European policy agenda ([15]).

EU trends in 'perceived social exclusion'

The 'perceived social exclusion index' included in the European Quality of Life Survey (EQLS) ([16]) provides an overall measure of social exclusion, by taking into account a variety of relevant issues such as the sense of connectedness, recognition of one's activities, and barriers to participation in wider society ([17]). According to the index in 2011 perceived social exclusion was the lowest in Denmark, Germany, Austria and Sweden and highest in Cyprus, Bulgaria, the Czech Republic and Greece. Most of the countries scoring low on the subjective indicator of social exclusion also rank lowest in terms of the objective measure of at risk of poverty and exclusion and vice versa. However, there are some exceptions; for example, although the Czech Republic has the second lowest at risk of poverty rate in the EU, the country ranks third in terms of high perceived social exclusion. Furthermore, although in 2011 Denmark and Germany had the lowest levels of perceived social exclusion, their poverty rates were higher than in other Member States such as Netherlands, Czech Republic and Austria.

Perceived social exclusion also seems to be closely related to life satisfaction at country level. Member States with high perceived social exclusion tend to have lower life satisfaction. However, there are again some exceptional cases. For instance, although in 2011 life satisfaction both in Germany and Cyprus was close to the EU average, Germany had some of the lowest and Cyprus the highest level of perceived social exclusion ([18]).

([13]) European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2011*, Luxembourg: Publications Office of the European Union, 2012 (p. 144).
([14]) Communication from the Commission, *Towards a Europe of solidarity. Intensifying the fight against social exclusion, fostering integration*, COM(92) 542 final, 23 December 1992.
([15]) For further explanations about the EU's concept of poverty and social exclusion, please see the video 'Poverty in Europe — beyond just income' on the Eurostat website.
([16]) The European Quality of Life Survey (EQLS) documents and analyses the living conditions and social situation of European citizens by looking at a range of issues, such as employment, income, education, housing, family, health and work-life balance. It also covers subjective topics ranging from level of happiness and life satisfaction to perceived quality of society. The survey is carried out regularly every four years. The latest EQLS was conducted between 2011 and 2012 in 34 countries (27 EU Member States and Croatia, Iceland, FYR Macedonia, Montenegro, Serbia, Turkey and Kosovo) and included about 1 000-3 000 interviews per Member States, depending on the population size.
([17]) The perceived social inclusion index is constructed on the basis of respondents' individual assessment of four statements related to different dimensions of social exclusion: (1) 'I feel left out of society', (2) 'Life has become so complicated today that I almost can't find my way', (3) 'I feel that the value of what I do is not recognised by others', (4) 'Some people look down on me because of my job situation or income'. The index is calculated as an average from the scores on each question.
([18]) Eurofound, *Third European Quality of Life Survey — Quality of life in Europe: Impacts of the crisis, Publications Office of the European Union*, Luxembourg, 2012. (p. 78)

What lies beneath this indicator?

The Europe 2020 strategy promotes social inclusion, in particular through the reduction of poverty, by aiming to lift at least 20 million people out of the risk of poverty and social exclusion.

The at-risk of poverty or social exclusion indicator corresponds to the number of people who are: at risk of poverty after social transfers, severely materially deprived or living in households with very low work intensity. People are only counted once even if they are present in more than one sub-indicator.

People at risk of poverty have an equivalised ([19]) disposable ([20]) income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income after social transfers. Material deprivation covers indicators relating to economic strain and durables. Severely materially deprived people have living conditions severely constrained by a lack of resources. They cannot afford at least four of the following: to pay rent or utility bills; to keep home adequately warm; to pay unexpected expenses; to eat meat, fish or a protein equivalent every second day; a week's holiday away from home; a car; a washing machine; a colour TV; or a telephone. People living in households with very low work intensity are those aged 0 to 59 living in households where the adults (aged 18 to 59) work less than 20 % of their total work potential during the past year.

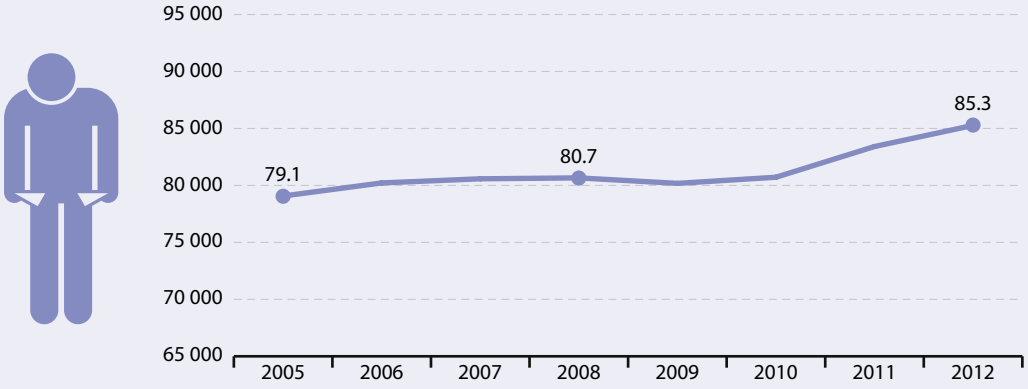
([19]) To take into account the impact of differences in household size and composition, the total disposable household income is 'equivalised'. The equivalised income attributed to each member of the household is calculated by dividing the total disposable income of the household by the equivalisation factor. Equivalisation factors can be determined in various ways. Eurostat applies an equivalisation factor calculated according to the OECD-modified scale first proposed in 1994, which gives a weight of 1.0 to the first person aged 14 or more, a weight of 0.5 to other people aged 14 or more and a weight of 0.3 to people aged 0–13.

([20]) Disposable income includes all income from work (employee wages and self-employment earnings); private income from investment and property; transfers between households; all social transfers received in cash including old-age pensions.

Risk of poverty after social transfers

4.6 million people fell into the 'at risk of monetary poverty' category in the EU between 2008 and 2012. This form of poverty remains the most prevalent in the EU

Figure 3.6: People at risk of poverty after social transfers, EU-27
(million people)



NB: 2005–2007 and 2012 data are Eurostat estimates.

Source: Eurostat (online data code: tsdsc280)

The number of people at risk of poverty after social transfers increased between 2008 and 2012 by about 5.7 %, from 80.7 million to 85.3 million. Monetary poverty has not only been the most widespread form of poverty, but has also shown an accelerated increase since 2009, most likely due to the economic crisis. In contrast to other poverty-related indicators presented in this chapter, the number of people at risk of poverty after social transfers, however, was already increasing before the economic crisis.

Social transfers alleviate the prevalence of monetary poverty

The 85.3 million people being at risk of poverty after social transfers in 2012 translate into a share of 17.1 % of the total EU population. Without the cushioning effect of social transfers, the share of people at risk of poverty would be even higher: in 2012 the share of the EU population at risk of poverty before social transfers was 25.0 %, almost eight percentage points higher.

Unemployment substantially increases the risk of being monetarily poor

In 2012, almost every second unemployed person was at risk of monetary poverty after social transfers. Of those not employed, almost 30 % have been at risk of poverty. For other economically inactive people, 27 % were at risk. The trend shows a tendency to rise. The at-risk-of-poverty rate of unemployed people has increased since 2005, from 39.7 % to 46.9 % in 2012.

9.5 % of the EU population were 'working poor' in 2012

The share of employed people in the EU living in households with insufficient disposable income to lift them out of poverty (the so-called 'working poor') declined between 2005 and 2010, from 9.3 % to 8.4 %, but increased substantially to 9.5 % by 2012.

In general, more men than women were at risk of poverty despite being employed. However, this has not been the case in the group of 18 to 24 year old workers, where women have been more affected than men (13.1 % compared with 11.7 % in 2012). Of all age groups, young workers have been most at risk of becoming part of the working poor. Part-time workers have been more affected than full-time workers.

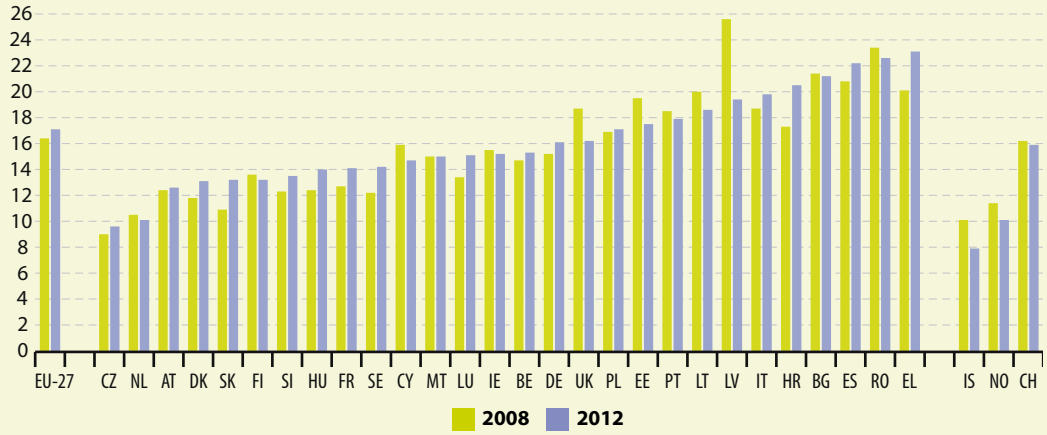
*People are considered **at risk of monetary poverty** when their equivalised disposable income (after social transfers) is below the at-risk-of-poverty threshold. This is set at 60 % of the national median equivalised disposable income after social transfers.*

***Social transfers** are benefits provided by national or local governments. They include benefits relating to education, housing, pensions or unemployment.*

How the number of people at risk of poverty after social transfers varies between Member States

Across the EU, Greece (23.1 %), Romania (22.6 %) and Spain (22.2 %) reported the highest rates of people at risk of poverty after social transfers in 2012. On the other side, the Czech Republic (9.6 %), the Netherlands (10.1 %) and Austria (12.6 %) performed best in terms of the percentage of the population living in monetary poverty in 2012.

Figure 3.7: People at risk of poverty after social transfers, by country
(% of population)



NB: 2011 data (instead of 2012) for BE, IE, AT and UK; 2012 data are estimates (EU-27) or provisional (IT).

Source: Eurostat (online data code: tsdsc280)

In 16 Member States, monetary poverty has increased since 2008, whereas in 12 Member States, the prevalence of monetary poverty has remained stable or decreased. In four Member States the rise in the number of people at risk of poverty after social transfers between 2008 and 2012 has been especially high, namely in Slovakia (21.1 %), Croatia (18.5 %), Sweden (16.4 %) and Greece (15.0 %).

It is important to note that since monetary poverty is a relative measure, a decrease in the poverty rate does not necessarily indicate that incomes have improved. In some cases, such as in Latvia and in the United Kingdom, the decrease in monetary poverty has been accompanied by a significant drop in the poverty threshold. This indicates a possible overall deterioration in incomes. In other countries such Hungary the increase in the at-risk-of-poverty rate has been accompanied by a rise in the poverty threshold. This means that a greater inequality in income distribution is becoming evident ([21]).

***Disposable income** includes all income from work (employee wages and earnings from self-employment); private income from investment and property; transfers between households; all social transfers received in cash including old-age pensions.*

What lies beneath this indicator?

The indicator is one of three components of the Europe 2020 strategy's headline indicator 'People at risk of poverty or social exclusion'. The indicator reflects the definition of poverty adopted by the European Council in 1975 which defined the 'poor' as 'those individuals or households whose resources are so low as to exclude them from the minimum acceptable way of life in the country where they live'. The indicator is a relative measure of income poverty and is responsive to the employment, education and welfare policies that are mobilised to fight poverty.

The indicator 'at-risk-of-poverty rate after social transfers' measures the share of people at risk of monetary poverty.

([21]) European Commission, *Social Europe: Current Challenges and the Way Forward. Annual Report of the Social Protection Committee*, 2012, (p. 25–26).

Severe material deprivation

A further 9.6 million people were living in conditions severely constrained by a lack of resources between 2008 and 2012. Severe material deprivation is the second most prevalent form of poverty in the EU

Figure 3.8: Severely materially deprived people, EU-27
(million people)

NB: 2005, 2006, 2009 and 2012 data are Eurostat estimates.

Source: Eurostat (online data code: tsdsc270)

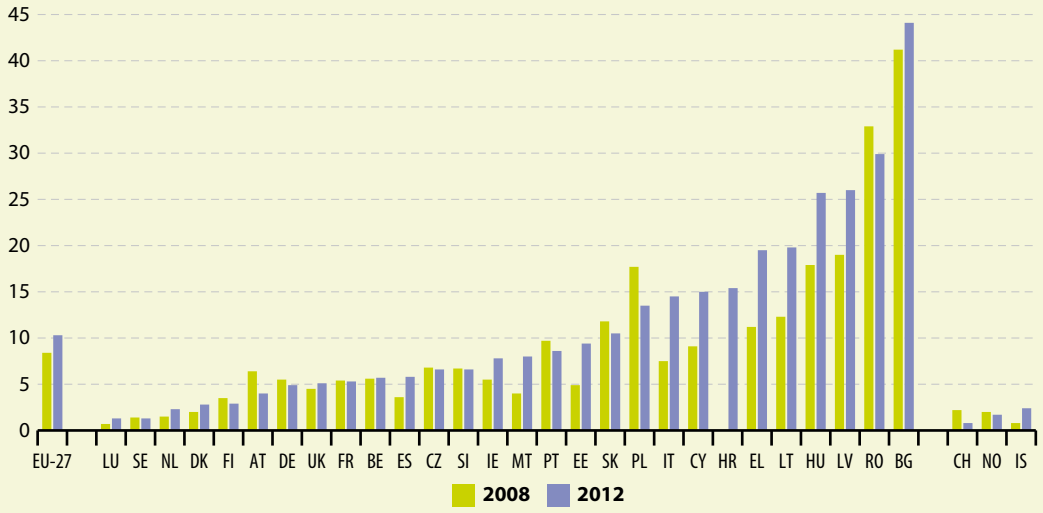
Between 2008 and 2012 the number of severely materially deprived people increased substantially, from 41.4 million to 51.0 million. In the pre-crisis period between 2005 and 2009, severe material deprivation had decreased continuously, reaching a minimum of 39.8 million people in 2009. However, most likely due to the economic crisis, the number of people living in conditions severely constrained by a lack of resources has been increasing since by almost one third. This has resulted in a share of 10.3 % of the EU population being affected by severe material deprivation in 2012.

How the number of severely materially deprived people varies between Member States

In 2012, levels of severe material deprivation across the EU ranged from 44.1 % in Bulgaria to 1.3 % in Luxembourg and Sweden. The persistent disparities in the share of severely materially deprived people between the Member States are likely to be the result of a combination of factors, including differences in living standards and overall level of development, as well as social policies for redistribution ([22]).

([22]) European Commission, *Social Europe: Current Challenges and the Way Forward*, Annual Report of the Social Protection Committee, 2012, (p. 27).

Figure 3.9: Severely materially deprived people, by country
(% of population)



Source: Eurostat (online data code: tsdsc270)

In a few Member States, for example in Romania, Latvia and Hungary, low living standards were a much more serious problem than income poverty in 2012. In Bulgaria, the proportion of the population living in severely deprived conditions was almost twice as high as the share of people living in monetary poverty. On the other hand, in some countries such as Spain and Ireland, high or relatively good living standards did not match the low rates of monetary poverty.

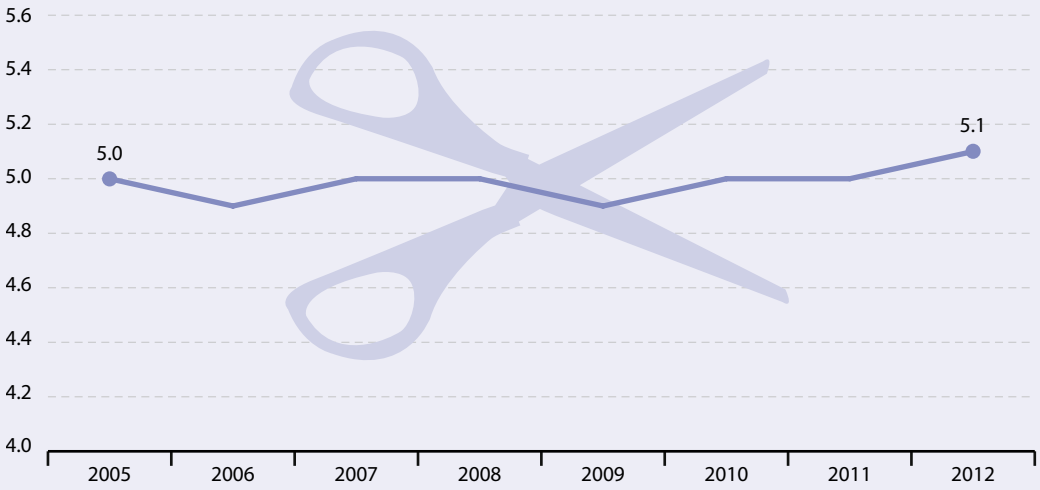
What lies beneath this indicator?

The indicator is one of three components of the Europe 2020 strategy's headline indicator 'People at risk of poverty or social exclusion'. Severely materially deprived people are living in conditions severely constrained by a lack of resources. They cannot afford four of the following: to pay rent or utility bills; to keep home adequately warm; to pay unexpected expenses; to eat meat, fish or a protein equivalent every second day; a week's holiday away from home; a car; a washing machine; a colour TV; or a telephone. The indicator thus measures poverty in absolute terms and therefore complements the relative (income-related) indicator on monetary poverty.

Income inequalities

Five times greater average income earned by the richest 20 % compared to the poorest 20 % in EU countries in 2012. Income inequality has been stable over time

Figure 3.10: Inequality of income distribution, EU-27
(income quintile share ratio)



NB: 2006 and 2012 data are Eurostat estimates.

Source: Eurostat (online data code: tsdsc260)

Between 2005 and 2011 the income quintile share ratio fluctuated between 4.9 and 5.0 without showing a clear trend in any direction. In 2012 income inequality increased marginally, yet to a new high of 5.1. This means that the richest 20 % of the EU population earned about five times more than the poorest 20 %. In 2012, low-income earners accounted for slightly less than 8 % of the total national equivalised income, while the high-income earners accounted for more than 38 %.

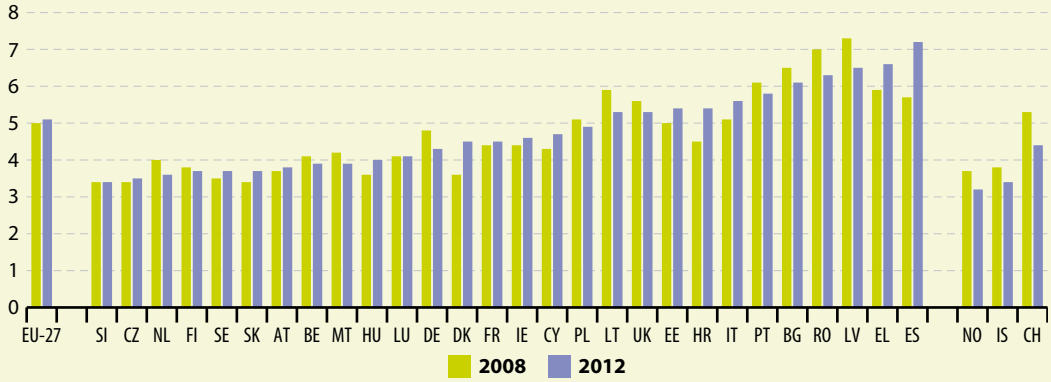
Whose income equality was hit hardest by the economic crisis?

In 2012, Spain and Greece were the countries with the highest income inequality across the EU, with income quintile share ratios greater than 6.5. In contrast, Slovenia and the Czech Republic were the most equal countries in terms of income distribution, with a ratio of 3.5 or below.

The consequences of the economic crisis were most prominent in Spain, where income inequality deteriorated by 26 % between 2008 and 2012. In contrast, income inequality improved most in Latvia, where the ratio fell by 11 %. In both cases the trend was driven by changes in the income of both the top and the bottom 20 % of the population. While in Spain a clear 'scissors' effect is visible with the poor getting poorer and the rich getting richer in terms of their shares in the national equivalised income, the trend was the opposite in Latvia.

Income quintiles *divide the population into five income groups from lowest income to highest income such that 20 % of the population is in each group. The first income quintile consists of 20 % of the population with the lowest incomes; the fifth quintile of 20 % of the population with the highest income.*

Figure 3.11: Inequality of income distribution, by country
(income quintile share ratio)



NB: 2011 data (instead of 2012) for BE, IE, AT and UK; 2012 data are estimates (EU-27) or provisional (IT); break in series for HR (2010) and LV (2011)

Source: Eurostat (online data code: tsdsc260)

*The **Gini coefficient** measures the extent to which the distribution of income within a country deviates from a perfectly equal distribution. A coefficient of 0 expresses perfect equality where everyone has the same income, while a coefficient of 100 expresses full inequality where only one person has all the income.*

EU trends in income inequality compared to other countries in the world based on the Gini coefficient

The Gini coefficient is another, commonly used measure for monitoring trends in income inequality. In 2012 the Gini coefficient for the EU was 30.5, having remained reasonably stable since 2005 (with the exception of a slight dip in 2006 and increase in 2008). At the Member State level income inequality was lowest in Slovenia (23.7), the Czech Republic and Sweden (24.9 each) and highest in Latvia (35.9) and Spain (35.0). On a global level, income is far more unequally distributed than within the EU. According to OECD data from 2010, the Gini coefficient and therefore income inequality was highest in Mexico (46.6) and the United States (38.0) and lowest in Iceland (24.4) ([23]).

Perceived tension between poor and rich people — is it only about income?

While countries such as Hungary, Slovenia and the Czech Republic have historically been well below the EU average in terms of income inequality, they rank among the ones where citizens tend to see tensions between poor and rich or admit they exist, according to the European Quality of Life Survey (EQLS) 2012. At the other end of the spectrum were countries such as Bulgaria and Spain, where income inequalities were among the highest in the EU in 2012, but where tensions between poor and rich were not well recognised. Yet, perceptions at EU level are in line with the recent marginal deterioration of income inequality. The share of EU citizens who reported tensions between rich and poor increased from 30 % in 2007 to 36 % in 2011–2012 ([24]). Thus, perception of tensions between poor and rich may be influenced by various factors (for example tensions between management and workers), and income distribution is a part of a more complex picture.

What lies beneath this indicator?

Reducing inequalities contributes to the EU Sustainable Development Strategy's goal of achieving a high level of social cohesion. The quintile share ratio focuses on the gap between the poorest and richest strata of society. It does not measure inequalities that occur in the middle segment or within the poorest or richest segments.

If income were completely evenly distributed, each household would have the same income and therefore the same share of the total income. However, in reality, income is unevenly distributed. The income quintile share ratio (S80/S20) is the ratio of the total income received by the 20 % of the country's population with the highest disposable income (top quintile) to that received by the 20 % of the country's population with the lowest disposable income (bottom quintile). The higher the ratio, the greater the income inequality.

([23]) OECD, Income Distribution and Poverty, Gini coefficient (at disposable income, post taxes and transfers)
([24]) Eurofound, *The future of Europe's labour market*, Foundation Focus issue 12, 2012

Very low work intensity

2.6 million more people were living in households with very low work intensity in the EU between 2008 and 2012. Lack of employment is a major driver of monetary poverty and material deprivation

Figure 3.12: People living in households with very low work intensity, EU-27
(million persons)

NB: 2005, 2006 and 2012 data are Eurostat estimates.

Source: Eurostat (online data code: tsdsc310)

In 2012, 36.9 million people or 9.8 % of the EU population aged 0 to 59 lived in households whose members were working at less than 20 % of their capacity. This means that in these households, either no one was working or its members were working at very low work intensity. This represents an increase of 7.8 % compared with 2008, when 34.3 million people were affected by lack of access to labour in the EU.

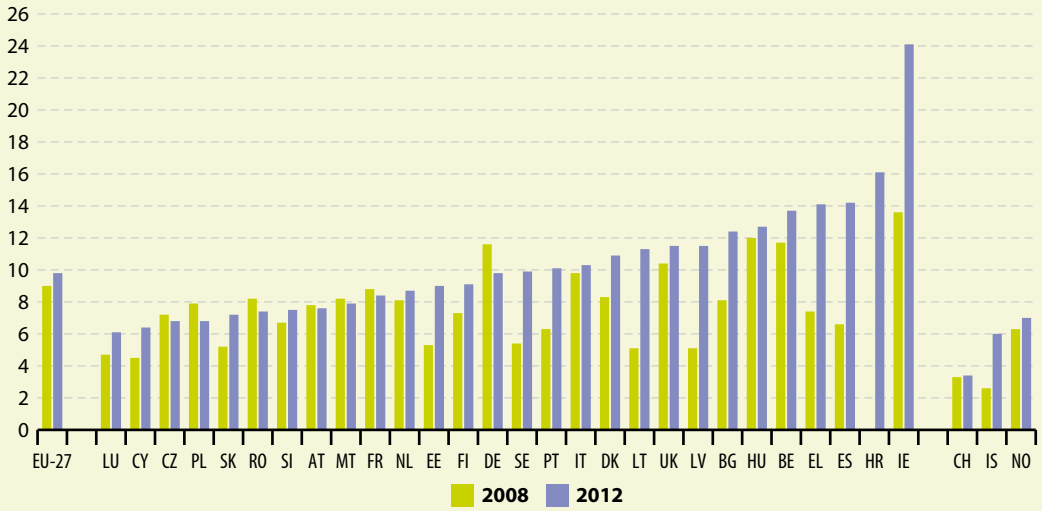
The number of people living in households with very low work intensity experienced ups and downs over the period 2005 to 2012. The number declined between 2006 and 2009, but increased after 2009 in parallel with the rising unemployment levels as a result of the crisis up to 2011 ([25]), only to drop again by 4.1 % by 2012. It is interesting to note that the drop in the number of people living in households with very low work intensity between 2011 and 2012 was largely driven by just two countries: Germany (– 11.6 %) and France (– 10.2 %).

How the number of people living in households with very low work intensity varies between Member States

In 2012 the percentage of people living in households with lack of access to labour ranged from less than 7 % in the Czech Republic, Cyprus, Luxembourg and Poland to more than 14 % in Spain, Greece, Croatia and Ireland. Between 2008 and 2012 lack of access to labour declined in seven countries, most notably in Germany (– 15.5 %), Poland (– 13.9 %), and Romania (– 9.8 %), whereas Latvia (+ 125.5 %), Lithuania (+ 121.6 %) and Spain (+ 115.2 %) experienced the highest increases in the share of people living in households with very low work intensity.

([25]) European Commission, *Social Europe: Current Challenges and the Way Forward. Annual Report of the Social Protection Committee*, 2012, (p. 28.)

Figure 3.13: Persons living in households with very low work intensity, by country
(% of population aged 0 to 59)



NB: 2011 data (instead of 2012) for BE, IE and UK; 2012 data are estimates (EU-27) or provisional (AT and IT).

Source: Eurostat (online data code: tsdsc310)

In some countries, the share of people living in households with very low work intensity increased by a similar proportion to the fall in the employment rate. It some countries it increased by an even greater amount (for example, Greece and Spain). This is probably due to the fact that declines in employment predominantly affect workers living in the most vulnerable households, such as single households (including lone parents), single breadwinner couples, or couples where both are employed in similar jobs with little possibility of increasing work intensity ([26]).

What lies beneath this indicator?

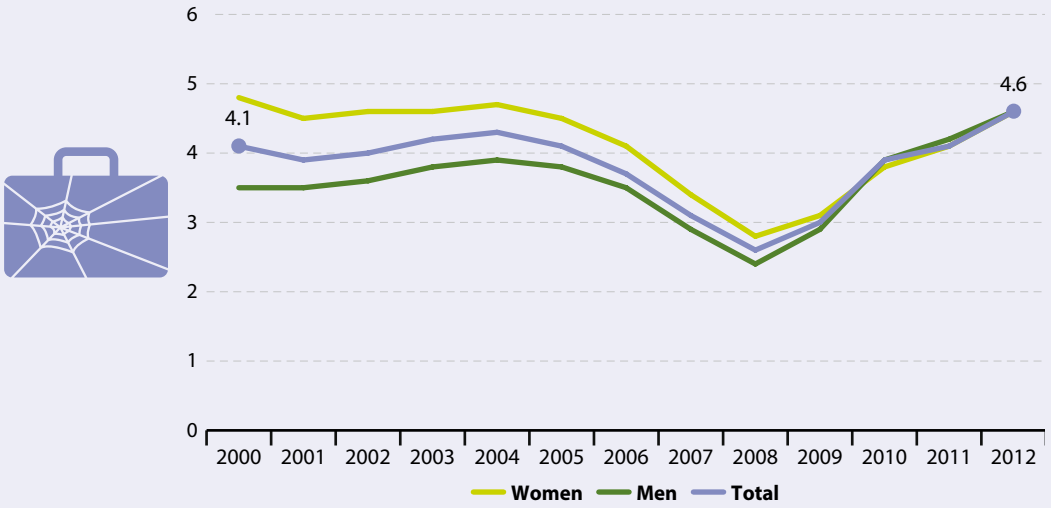
The indicator is one of three components of the new social inclusion headline indicator 'People at risk of poverty or social exclusion' set out in the Europe 2020 strategy. People are defined as living in households with very low work intensity if they are aged 0 to 59 and the working age members in the household worked less than 20 % of their potential during the past year.

([26]) European Commission, *Social Europe: Current Challenges and the Way Forward. Annual Report of the Social Protection Committee*, 2012, (p. 28.)

Long-term unemployment

0.5 percentage points increase in long-term unemployment in the EU between 2000 and 2012. The trend was more or less favourable until 2008, but the situation worsened considerably with the onset of the economic crisis

Figure 3.14: Long-term unemployment rate, by sex, EU-27
(%)



Source: Eurostat (online data code: tsdsc330)

Between 2004 and 2008, the rate of people being unemployed for longer than a year declined. However, with the onset of the economic crisis this trend has reversed, growing by 2 percentage points between 2008 and 2012 and reaching a new high of 4.6 % in 2012.

Gender gaps in long-term unemployment

During the early part of the last decade, women have been slightly more likely to be long-term unemployed than men, regardless of their age. The rates have assimilated since then. Among the young long-term unemployed, more men than women are affected, which can be explained by a higher proportion of male early school leavers ([27]).

What lies beneath this indicator?

A large number of long-term unemployed people over long periods of time generate huge social and economic costs in terms of passive labour market expenditure and/or on social assistance systems which can provide support when the long-term unemployed exhaust their rights to unemployment benefits. Long-term unemployed people are also at a high risk of social exclusion.

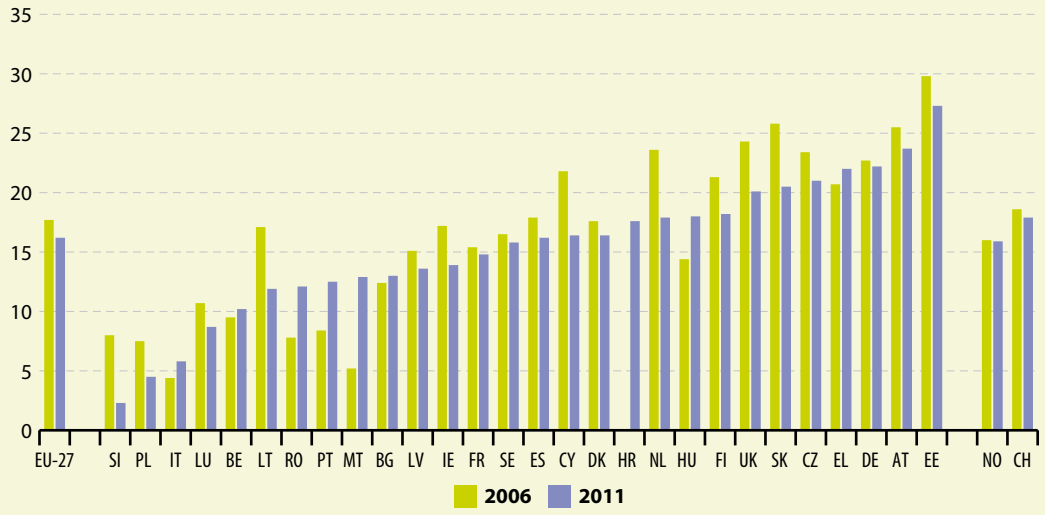
A period of unemployment of one year or more is the main criterion for measuring long-term unemployment. The unemployment rate comprises people aged at least 15, who will be without work during the next two weeks, who would be available to start work within the next two weeks and who are actively seeking work.

([27]) European Commission, *European Employment Observatory Review, Long-term Unemployment*, 2012, (p. 8).

Gender pay gap

1.5 percentage point drop in the gap between women's and men's earnings in the EU between 2006 and 2011. This means the hourly gross earnings of women are catching up with those of men

Figure 3.15: Gender pay gap in unadjusted form, by country
(%)



NB: 2008 data for EL, 2010 data for IE (instead of 2011); 2011 data for EU-27, AT, CY, DE, FI, FR, HR and LU are estimates or provisional.

Source: Eurostat (online data code: tsdsc340)

The gap between women's and men's earnings fell continuously in the EU between 2006 and 2011. Despite this favourable trend, hourly gross earnings of women were still 16.2 % lower than those of men in 2011.

At Member States level, the gender pay gap ranged from less than 5 % in Slovenia and Poland (2.3 % and 4.5 % respectively) to more than 20 % in the United Kingdom (20.1 %), Slovakia (20.5 %), the Czech Republic (21 %), Germany (22.2 %), Austria (23.7 %) and Estonia (27.3 %). Despite an overall decline at the EU level since 2006, the gender pay gap was widened in some countries such as Italy, Latvia and Portugal.

What lies beneath this indicator?

Occupational segregation of the sexes is one of the most commonly cited reasons for the gender pay gap. On the one hand, women tend to be employed in predominantly low-valued and low-paid sectors. This is often linked to gender stereotyping, occupational possibilities for part-time employment, traditions and societal norms, which affect educational and career choices. On the other hand there is a lack of women in senior and executive level positions. This is commonly related to caring responsibilities, personality differences and lack of progression opportunities in part-time jobs ([28]). Due to the impact of the gender pay gap, women earn less over their lifetimes compared to men. This results in lower pensions and a risk of poverty in old age.

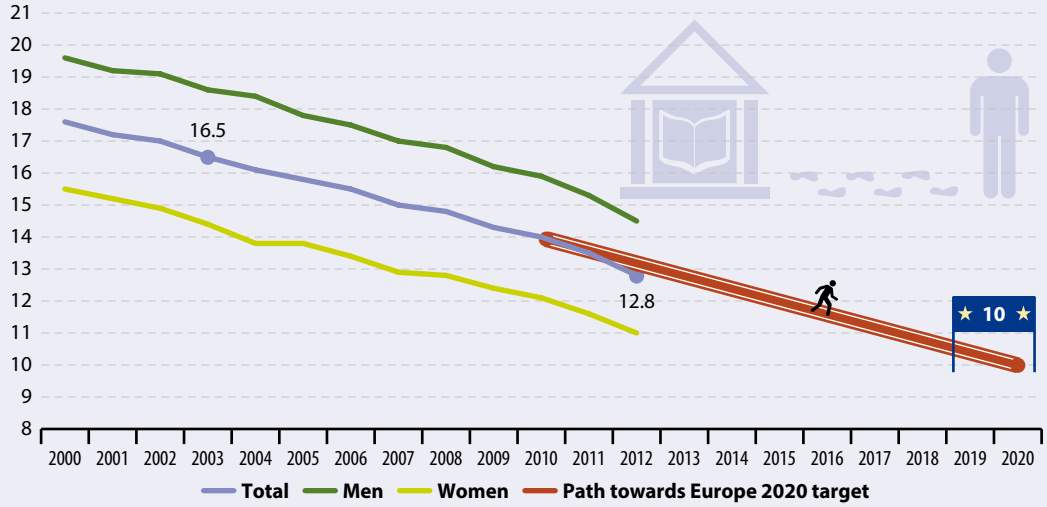
The unadjusted gender pay gap (GPG) represents the difference between average gross hourly earnings of male and female paid employees as a percentage of average gross hourly earnings of male paid employees. All employees working in firms ([29]) with ten or more employees are included.

([28]) New JNCHES Equality Working Group, *The Gender Pay Gap — A Literature Review*, 2011.
([29]) Firms: the whole economy except agriculture, fishing, public administration, private households and extra-territorial organisations.

Early school leavers

3.7 percentage point drop in the share of early leavers from education and training in the EU between 2003 and 2012. If this trend can be sustained, the Europe 2020 target of reducing the rate of early school leavers ([30]) to less than 10 % by 2020 should be in reach

Figure 3.16: Early leavers from education and training, EU-27
(% of the population aged 18 to 24 with at most lower secondary education and not in further education or training)



NB: 2000 and 2001 data are estimates; break in series in 2003; 2012 data are provisional; Europe 2020 target: less than 10 %.

Source: Eurostat (online data code: tsdsc410)

Since 2003 the share of those aged between 18 and 24 who have not completed lower secondary education and are not in further training has fallen steadily, by an average of 2.8 % per year. The trend has accelerated since 2010, with the share of early leavers from education and training falling by 3.6 % in 2011 and 5.2 % in 2012. If these dynamics can be sustained, the Europe 2020 targets of reducing the share of early leavers from education and training to less than 10 % should be in reach.

Box 3.3: How does the EU tackle early school leaving?

The Europe 2020 strategy calls for intensified efforts to reduce the proportion of early leavers from education and training to less than 10 % by 2020. The 10 % target is stated as one of five headline targets to be reached by 2020. The EU Sustainable Development Strategy encompasses the same target, with the additional aim of ensuring that at least 85 % of 22 year olds have completed upper secondary education.

More boys than girls leave school early

Over the entire reviewed time span, girls were more likely to reach upper secondary education compared to boys. In 2003, 18.6 % of boys left school with at most lower secondary education, whereas the girls' share of early school leavers was 14.4 %. In 2012, the difference between the boys' (14.5 %) and the girls' share (11.0 %) was slightly smaller.

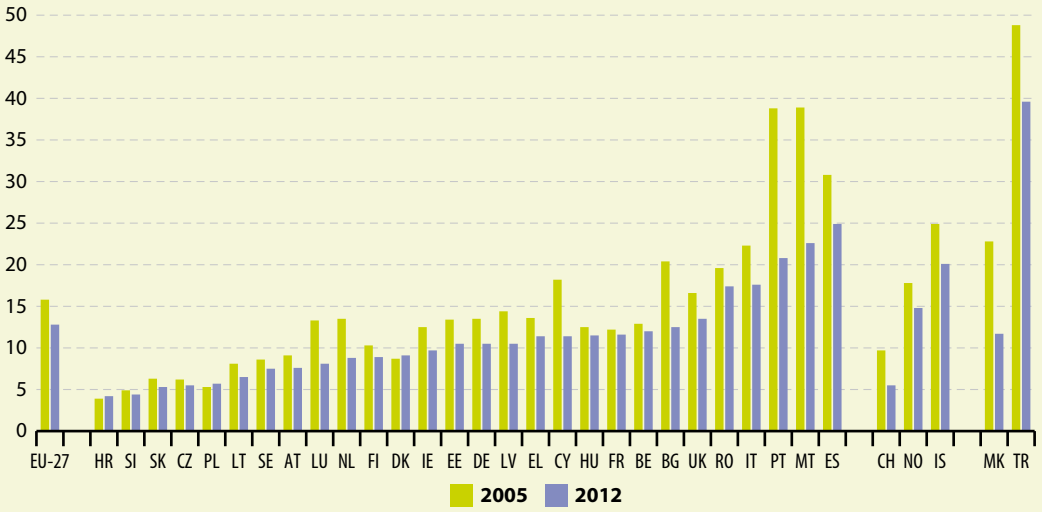
([30]) The terms 'early school leavers' and 'early leavers from education and training' are used interchangeably throughout the text.

Similarly, young migrants have a much higher tendency to abandon formal education prematurely. In 2011, the share of early leavers from education and training among those who were foreign-born (26 %) was almost twice as high as among the total EU population (14 %). The situation is similar for ethnic minorities such as Roma ([31]).

How the number of early school leavers varies between Member States

At Member State level, the share of early leavers from education and training varied considerably in 2012, from 4.2 % in Croatia to 24.9 % in Spain. School drop-out rates were generally highest in Southern Europe and lowest in Eastern Europe. Between 2005 and 2012 almost all countries achieved a reduction in the share of early leavers from education and training, with the most notable improvements occurring in Southern Europe. In 2012, 13 countries had already met the overall Europe 2020 target of reducing rates of early school leaving to less than 10 %.

Figure 3.17: Early leavers from education and training, by country
(% of the population aged 18 to 24 with at most lower secondary education and not in further education or training)



NB: 2006 data for SE, NO, MK and TR (instead of 2005), 2007 data for HR and UK (instead of 2005); provisional data for MT (2005) and EU-27, DE, LU, NL, PL (2012); break in series for DK (2007), LU (2009), MT and NL (2010), LV (2011)

Source: Eurostat (online data code: tsdsc410)

What lies beneath this indicator?

Young adults who lack a basic education are more likely to be unemployed or working in low-wage jobs, and are less likely to progress in their career. A basic education may allow people to adapt to a changing labour market.

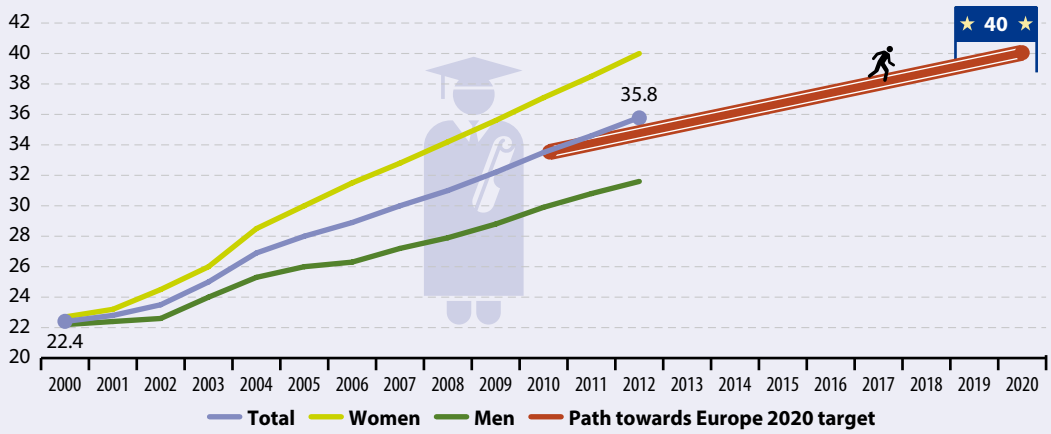
The indicator is defined as the percentage of the population aged 18 to 24 with at most lower secondary education (UNESCO's International Standard Classification of Education (ISCED) levels 0, 1, 2 or 3c short) and who were not in further education or training during the four weeks preceding the survey. There are seven levels of education in ISCED. Level 0 corresponds to pre-primary education, level 1 to primary education, level 2 to lower secondary education and level 3c short to programmes at level 3 (upper secondary education) not designed to lead directly to level 5 (first stage tertiary education), but to labour market or level 4 programmes (post-secondary non-tertiary education).

([31]) In 2011 the European Commission adopted the EU Framework for National Roma Integration Strategies, thus showing its commitment to Roma inclusion in regard to four crucial areas — access to education, health care, employment and essential services.

Tertiary education

13.4 percentage points increase in the share of the 30 to 34 years old population with tertiary education in the EU between 2000 and 2012. The Europe 2020 target of reaching a share of 40 % by 2020 seems to be attainable

Figure 3.18: Tertiary educational attainment, EU-27
(% of the population aged 30 to 34 with completed tertiary education (ISCED levels 5 and 6))



NB: Europe 2020 target: at least 40 %.

Source: Eurostat (online data code: tsdsc480)

After growing continuously for more than a decade, in 2012 the share of 30 to 34 year olds in the EU who had completed tertiary education had reached 35.8 %. This is a significant improvement compared with 22.4 % in 2000. This favourable trend suggests that the Europe 2020 target of raising the share of 30 to 34 year olds who have completed tertiary education to 40 % by 2020 is likely to be met ([32]).

Box 3.4: How does the EU foster tertiary education?

The Europe 2020 includes the target of 'increasing the share of 30 to 34 year olds having completed tertiary or equivalent education to at least 40 %' by 2020. 'Tertiary' education means university or university-like education according to UNESCO's International Standard Classification of Education (ISCED) level 5 or 6.

Women meet Europe 2020 target, while men increasingly lag behind

In 2000, the share of women and men having a tertiary education degree was similar. At that time, 22.7 % of women and 22.2 % of men aged 30 to 34 had completed tertiary education. Between 2000 and 2012 the increase was almost twice as fast for women. By 2012, women had significantly outnumbered men in terms of tertiary educational attainment in all Member States except for Luxembourg. The corresponding share was 40 % for women and 31.6 % for men. This means that women had already achieved the Europe 2020 target in 2012.

The gender inequalities in favour of women stem from various demographic, economic, sociological and educational factors. None of these factors are likely to reverse in the next few years, which will presumably lead to persisting and even increasing educational inequalities, disadvantaging men ([33]).

([32]) The Europe 2020 target is to increase the share of 30 to 34 year olds having completed tertiary education to at least 40 %. Tertiary education is defined in accordance with UNESCO's International Standard Classification of Education (ISCED) levels 5 and 6.
([33]) OECD, *Higher Education to 2030 (Vol. 1): Demography*, Chapter 10, Paris 2008, (p. 292 ff).

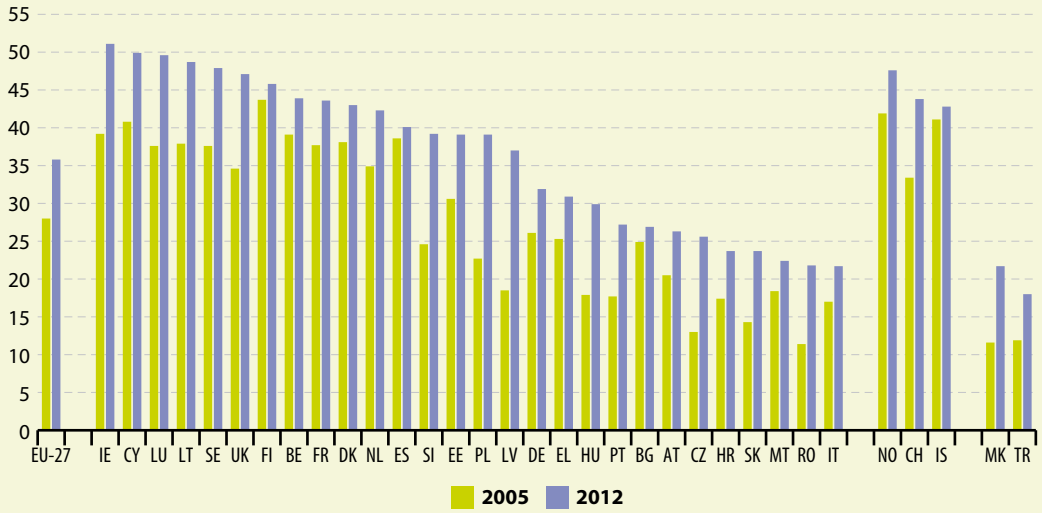
As with the persistent gender differences for early school leavers and tertiary education, people with a migration background tend to have lower education attainment than EU citizens. As such, the higher likelihood of migrants to abandon education prematurely, as shown in the indicator early leavers from education and training, is also reflected in their tertiary educational attainment levels. In 2011, only 31 % of foreign-born 30 to 34 year olds had completed tertiary education, compared with a share of 35 % in the total EU population. The gap was particularly large for women (32 % for foreign-born as opposed to 39 % of the total female population), whereas it was almost negligible for men (29 % for foreign-born compared with 31 % of the total male population).

How the share of people achieving tertiary education varies between Member States

Between 2005 and 2012 tertiary educational attainment rates increased in all Member States. This reflects investments in higher education to meet the demand for a higher skilled workforce but also the shift to shorter degree programmes following the implementation of the Bologna process reforms in some Member States ([34]).

In 2012, 12 Member States already exceeded the Europe 2020 target of 40 %, the majority of them being countries from Northern and Central Europe. On the other end of the scale, the lowest tertiary educational attainment rates — of less than 25 % — were observed in Italy, Romania, Malta, Slovakia and Croatia.

Figure 3.19: Tertiary educational attainment, by country
(% of the population aged 30 to 34 with completed tertiary education (ISCED levels 5 and 6))



NB: 2006 data (instead of 2005) for NO, MK and TR, 2007 data (instead of 2005) for DK; break in series for LU (2009), MT and NL (2010), LV (2011); provisional data for MT (2005), NL and PL (2012).

Source: Eurostat (online data code: tsdsc480)

What lies beneath this indicator?

Tertiary education is crucial to Europe's ambition of being a world leader in the global knowledge economy.

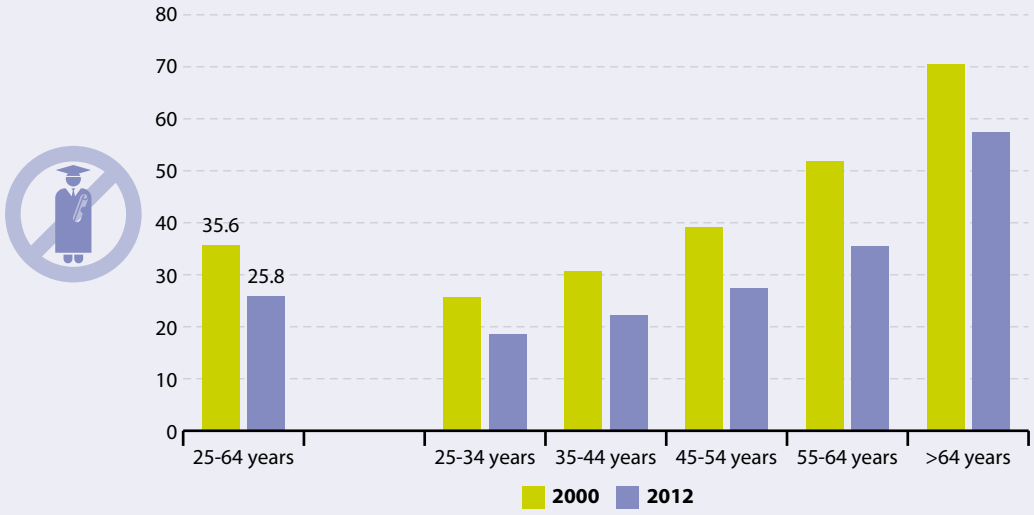
The indicator measures the share of the population aged 30-34 years who have successfully completed tertiary education. Tertiary education is defined in accordance with UNESCO's International Standard Classification of Education (ISCED) levels 5 and 6. Level 5 corresponds to the first stage of tertiary education, not leading directly to an advanced research qualification. Level 6 corresponds to the second stage of tertiary education, leading to an advanced research qualification.

([34]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Luxembourg: Publications Office of the European Union, 2012 (p. 23).

Adults with low educational attainment

9.8 percentage points drop in the share of low-educated adults in the EU between 2000 and 2012. Younger people tend to have higher educational levels

Figure 3.20: Persons with low educational attainment, by age group, EU-27
(% of population with at most lower secondary education)



Source: Eurostat (online data code: tsdsc430)

In 2000, 35.6 % of 25 to 64 year olds were considered as having low educational attainment, that is, no more than lower secondary education. By 2012 this share has fallen substantially to 25.8 %. This favourable trend is visible across all age groups. The reasons for this decline include intensified training of adults and, above all, the presence of a cohort effect: younger people, especially women, tend to have better education, and as they grow older the prevalence of low educational attainment in a given age group declines.

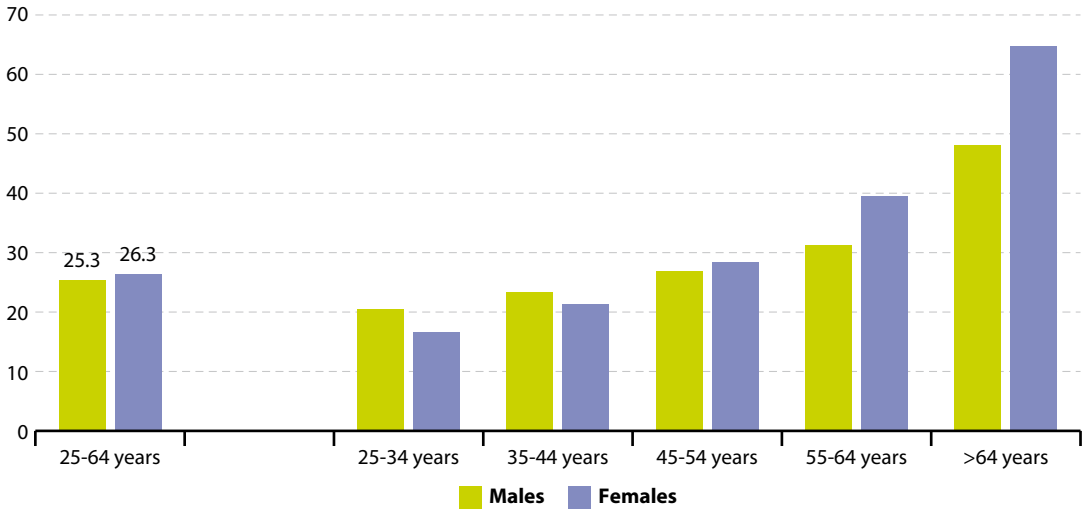
Individuals with low levels of education are more likely to be in low-quality employment and therefore at a higher risk of poverty and social exclusion (see the analysis on 'people at risk of poverty or social exclusion' above). In general, employment rates are higher for people with better education levels (see the chapter 'Socioeconomic development'). The reverse is true for unemployment: unemployment rates are generally lower for people with better education levels. Young people aged 15 to 24 with low education levels bear the highest risk of unemployment. In 2012, their unemployment rate was at 30 % and thus much higher than for the total population aged 15 to 24 (22.9 %).

The results from an EU/OECD survey on adult skills underline the importance of lifelong, skills-oriented learning ([35]). The survey found that one in five European adults had low literacy and numeracy skills. Those with the lowest literacy level were almost twice as likely to be unemployed compared with the general population ([36]).

As with the other education indicators, low educational attainment is more widespread among migrants than among the total EU population.

([35]) The survey is a product of the Programme for the International Assessment of Adult Competencies (PIAAC). It was conducted in 23 countries and published in 2013, see http://www.oecd.org/site/piaac/.
([36]) OECD, *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*, OECD Publishing, 2013.

Figure 3.21: Persons with low educational attainment, by sex and age group, EU-27, 2012
(% of population with at most lower secondary education)



Source: Eurostat (online data code: tsdsc430)

Low educational attainment more widespread among older women, while younger women outperform men

In 2012, 16.6 % of women aged 25 to 34 had low educational attainment. The share of men in the same age group with low levels of education was higher, at 20.4 %. On the contrary, in the age groups of 45 to 54 year olds and above, low educational attainment was more widespread among women than men. These gender differences can also be observed for the other education indicators mentioned in this chapter, namely early school leavers, tertiary education and lifelong learning.

What lies beneath this indicator?

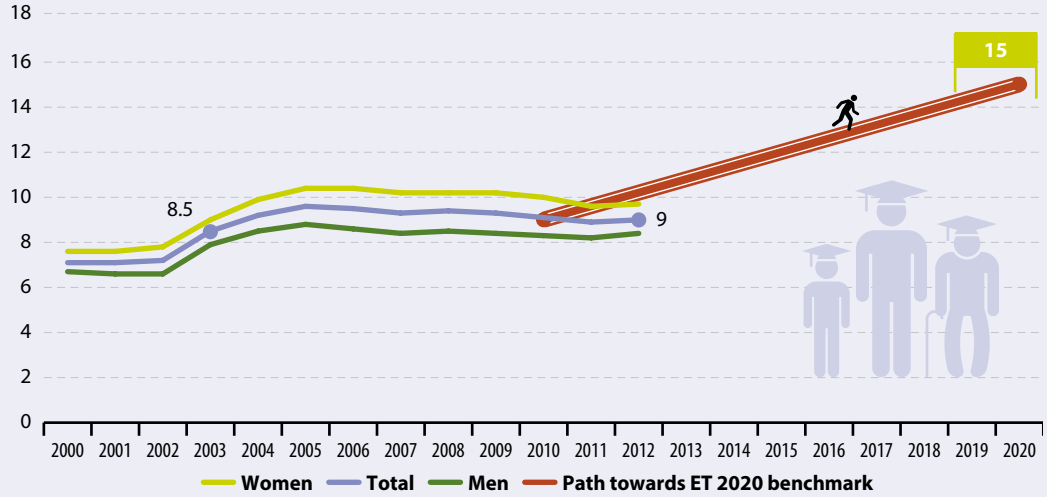
Low educational attainment is regarded as a barrier to personal and professional development and impedes society's ambition of reducing inequalities between individuals or groups. The indicator is linked to the goals of the EU Sustainable Development Strategy and the Europe 2020 strategy to reduce the proportion of early leavers from education and training to less than 10 % by 2020.

The indicator is defined as the share of the population aged 25 to 64 with at most lower secondary education, referring to UNESCO's International Standard Classification of Education (ISCED) levels 0, 1 or 2. There are seven levels of education in ISCED. Level 0 corresponds to pre-primary education, level 1 to primary education and level 2 to lower secondary education.

Lifelong learning

0.5 percentage points increase in participation in lifelong learning in the EU between 2003 and 2012. No improvement observable since 2005, putting into question the achievement of the 2020 benchmark of at least 15 % of adults participating in lifelong learning

Figure 3.22: Lifelong learning, EU-27
(% of population aged 25 to 64)



NB: 2000 and 2001 data are estimates, break in series in 2003.

Source: Eurostat (online data code: tsdsc440)

Between 2003 and 2005 the share of the adult working population participating in continued education and training increased from 8.5 % to 9.6 %. Since then, however, the rate has not made further progress towards the benchmark set in the EU's Strategic Framework for Education and Training (ET 2020) ([37]), which aims to increase the share of adults participating in lifelong learning to at least 15 % by 2020.

Concerning differences between Member States, the Nordic countries showed the highest participation rates in 2012, reaching between 20 % and 30 %. The Netherlands, Slovenia, Austria, Luxembourg, Spain, and Estonia had participation rates between 10 % and 20 %. Bulgaria, Greece and Romania have had little or no progress in improving their low levels of involvement in lifelong learning. Estonia and Luxembourg managed to increase their rates substantially ([38]).

Women participate more in lifelong learning

In 2012, the share of women participating in lifelong learning was higher than men (9.7 % as opposed to 8.4 %). This gender difference is observable for the whole period 2000 to 2012. The lower participation of men may be related to a higher preference for non-formal job-related learning that is not covered by this indicator.

([37]) As part of the strategic framework for European cooperation in education and training (ET 2020), the EU has set eight benchmarks for 2020. One of these addresses lifelong learning.
([38]) European Commission, *Progress towards the common European objectives in education and training, Indicators and benchmarks*, 2010/2011, (p.35).

Similarly, higher educated people are more likely to participate in lifelong learning activities than those with medium or lower educational attainment. In 2012, only 3.9 % of adults with at most lower secondary education were engaged in lifelong learning, compared with 16.1 % of adults with tertiary education.

Migrants also tend to be slightly more involved in lifelong learning, which may be due to participation in targeted learning activities such as language courses. In 2011, the share of migrants participating in lifelong learning was 9.9 % ([39]).

Box 3.5: EU initiatives to promote lifelong learning

The Europe 2020 flagship initiative 'Agenda for new skills and jobs' ([40]) presents concrete actions aimed at helping the EU reach its employment target of having 75 % of the working-age population (20 to 64 years) in work by 2020. One of these actions — 'Equipping people with the right skills for the jobs of today and tomorrow' — is directly linked with lifelong learning.

The Europe 2020 flagship initiative 'Youth on the move' ([41]) also supports lifelong learning as one of its four main lines of action, to develop key competences and quality learning outcomes, in line with labour market needs; this also means tackling the high level of early school leaving.

In 2009, EU Member States and the European Commission have strengthened cooperation with a strategic framework for European cooperation in education and training (ET 2020) ([42]). According to this framework, lifelong learning needs to be a priority, as it is key to employment, economic success and full participation in society. One of the eight benchmarks for 2020 addresses lifelong learning: 'An average of at least 15 % of adults (age group 25–64) should participate in lifelong learning'.

The EU has also set up a number of initiatives to promote mobility in higher education under the Lifelong Learning Programme ([43]), including Erasmus for study exchanges and placements ([44]), Erasmus Mundus for postgraduate studies ([45]), Leonardo Da Vinci for vocational education and training ([46]), Marie Curie for research fellowships ([47]) and Grundtvig for adult education ([48]).

What lies beneath this indicator?

Lifelong learning encompasses all purposeful learning activities, whether formal, non-formal or informal, that are undertaken on an ongoing basis with the aim of improving knowledge, skills and competence. Lifelong learning is indispensable for improving and developing skills, advancing careers, adapting to technological development and returning to the labour market.

The indicator lifelong learning refers to people between 25 and 64 who stated that they received education and training in the four weeks before the survey (numerator) compared to the total population of the same age group (denominator). People who did not answer the question 'participation to education and training' are excluded from the reference population. In contrast to the concept of lifelong learning, lifelong learning statistics do not cover informal learning such as self-learning through the use of printed material, computer-based learning/training, online internet-based web education, or visiting libraries.

([39]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Luxembourg: Publications Office of the European Union, 2012 (p. 49).
([40]) European Commission, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM(2010) 682 final, Strasbourg, 2010.
([41]) European Commission, *Youth on the Move: An initiative to unleash the potential of young people to achieve smart, sustainable and inclusive growth in the European Union*, COM(2010) 477 final, Brussels, 2010.
([42]) Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020') (2009/C 119/02), Official Journal of the European Union, 28.5.2009.
([43]) See http://ec.europa.eu/education/lifelong-learning-programme/index_en.htm.
([44]) See http://ec.europa.eu/education/erasmus/students_en.htm.
([45]) See http://eacea.ec.europa.eu/erasmus_mundus/results_compendia/selected_projects_action_1_master_courses_en.php.
([46]) See http://ec.europa.eu/education/lifelong-learning-programme/ldv_en.htm.
([47]) See http://ec.europa.eu/research/mariecurieactions/about-mca/actions.
([48]) See http://ec.europa.eu/research/mariecurieactions/.

4

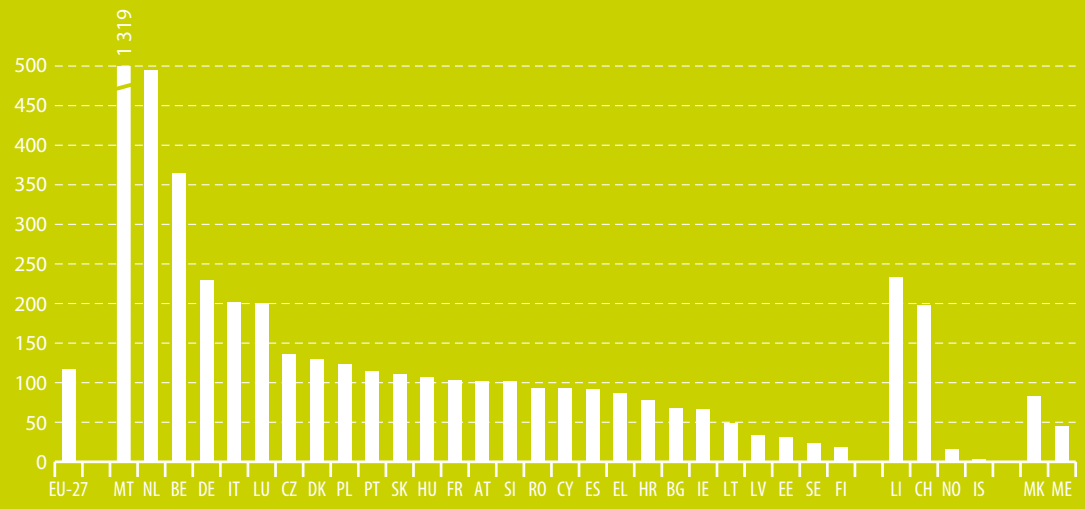
Demographic changes

Demographic changes seen through the lens of the Green Economy

Space is a finite resource — but not in all countries

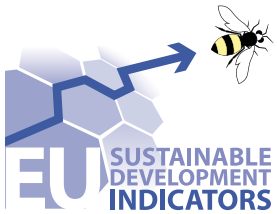
Scandinavia and the Baltic countries offer the most space for their inhabitants. With less than 50 inhabitants per km² (2011 figures), these countries were much more scarcely populated than the EU as a whole. At the other end of the scale, the island of Malta was the most 'crowded' place to live in the EU, with more than 1 300 people having to share one km². The Netherlands and Belgium followed at some distance, with population densities of 495 and 365 inhabitants per km² respectively. Despite their size, Germany and Italy also show population densities higher than in most other EU countries.

Population density, by country, 2011
(inhabitants per km²)



NB: EU-27 data are estimates.

Source: **Eurostat (online data code: tps00003)**



Overview of main changes

Trends in the sub-theme 'demography' have been favourable, albeit to varying degrees. The fertility rate and life expectancy of women have increased very marginally, by less than 1 % per year. Substantial progress has been made in the employment rate of older workers, which is also reflected in a slight increase in the duration of working life. However, the employment rate of older workers has remained well below the employment levels of younger age groups. The income level of elderly people has developed favourably, even though this might be linked to economic factors other than real gains in pensions. As a persisting effect of the recession, public debt levels rose to an average of 85 % in the EU by 2012.

Table 4.1: Evaluation of changes in the demographic changes theme (EU-27, from 2000) ([1])

Level 1	Level 2	Level 3
Employment rate of older workers ([2])	**Demography**	
	Life expectancy at age 65 (men's) (*)	Fertility rate (*)
	Life expectancy at age 65 (women's) (*)	: Migration
	Old-age income adequacy	
	Income level of over 65s compared to before	
	Public finance sustainability	
	Public debt	Retirement

(*) From 2002 (**) From 2005

([1]) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.
([2]) Due to a change in the methodology, the evaluation of the indicator is not comparable with previous editions of the Monitoring Report: so far, the employment rate of older workers has been evaluated against the 50 % target set out in the Lisbon strategy and the EU Sustainable Development Strategy, to be reached by 2010. Since the validity of the target has expired, and in the absence of a new target for older workers in the Europe 2020 strategy or in a revised EU SDS, the evaluation in this 2013 edition is only based on the trend over time, which results in a drastic change of the weather symbol to "clearly favourable" despite the fact that the original target has still not been met.

Demographic changes seen through the lens of Quality of Life

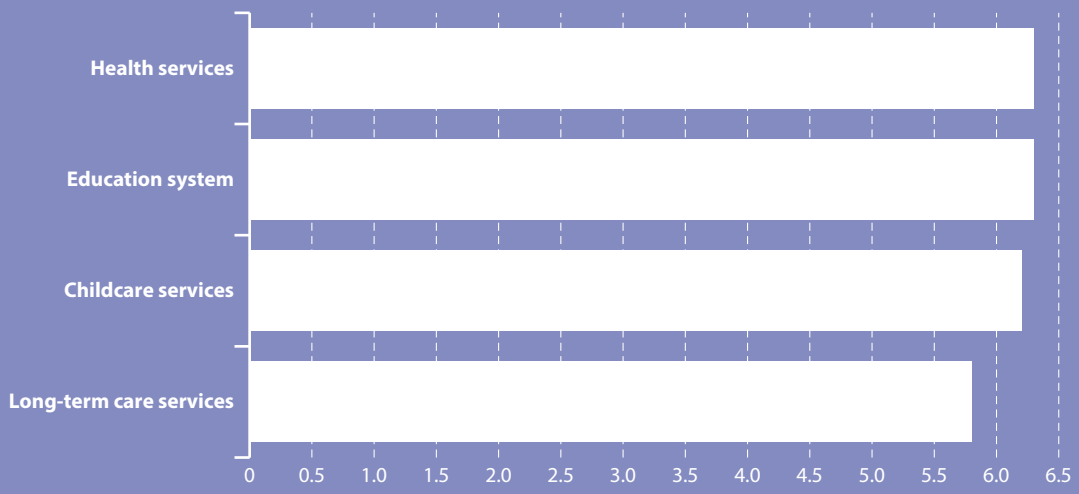
Europeans are more satisfied with their education system, health and childcare services than with long-term care

Access to high quality services of general interest such as healthcare, education, child and long-term care, are fundamental for ensuring quality of life in the EU. Public services are estimated to contribute to almost a quarter of EU's GDP. The health and social care sectors are among the largest, and their importance is growing continuously and at a fast pace due to population ageing and rising demand for personalised care and professional social service.

In general, Europeans are more satisfied with health services, education services and childcare as compared to long-term care. However, the perceived quality of public services tends to vary greatly between different subgroups of the population. Older people and those in the highest income quartiles tend to give higher ratings to health services than the younger and those in the lowest quartiles. The education system is rated highest by people in higher income quartiles and the younger. Overall, lower income households give a higher rating to childcare services and satisfaction of women tends to be higher than for men. Long-term care services are on average rated highest by people in the highest age group (60 and over) and those with lower income levels.

There also exist large variations in the ratings of public services between Member States. Health care system is rated highest in Austria (8.0) and lowest in Bulgaria (4.5). Both education system and childcare services ratings are highest in Finland (8.1 and 7.7, respectively) and lowest in Greece (4.6 and 4.9). Ratings of the quality of long-term care services range from 7.6 in Luxembourg to 3.8 in Bulgaria.

Perceived quality of public services, 2012
(mean of scores, scale 1–10)



Source: European Quality of Life Survey

Why do we deal with demographic change?

Demographic change is an important driver for current challenges in social policy and will probably be even more so in the future. While the global population is predicted to increase significantly, Europe's share is shrinking. Because the average number of children born per woman in the EU is far below the number of children needed to maintain the current population, the EU population is continually decreasing. A relevant factor in this context is the net migration rate, showing the ratio of people leaving to those entering the EU. From 2015 onwards positive net migration is expected to be the only population growth factor in the EU. Economically productive migrants contribute to the economy in terms of labour and taxes. Furthermore, migrant workers may also increasingly be needed to maintain the sustainability of pension systems. The EU Sustainable Development Strategy recognises the contribution of positive net migration to meeting the challenge of demographic change.

Beside fertility and migration, population change is influenced by life expectancy. Because people live longer and births are declining, the EU's population will grow older. The shrinking proportion of working-age population combined with the increasing number of retirees increasingly puts pressure on public finances. Therefore, there is a need for a closer look at the balance between these two groups. This issue is particularly important in the future EU demographic context, because the very old population group (80+) is expected to grow faster than any other age group over the following decades. Furthermore there is no clear empirical conclusion about whether the health of the older population will continue to improve ([3]).

Issues dealt with in the demographic changes theme are interlinked with topics analysed in other chapters in multiple ways. People in good health are more likely to work until the official retirement age (or longer) than people with physical or mental problems. Thus, public health influences employment rates of older workers and the duration of working life. High educational levels and life-long learning also affect labour market integration of older workers, reducing their risk of poverty. Furthermore, raising the employment rate of older workers and the duration of working life is becoming increasingly important for economic growth and sustainability of pension systems. The same is true for public debt, which is an important factor in view of ensuring the sustainability of Europe's welfare. It is therefore strongly linked to economic development, employment and social protection but also to the capacity of a country to innovate.

([3]) European Commission and Economic Policy Committee, *The 2012 Ageing Report: Economic and budgetary projections for the EU-27 Member States (2010–2060)*, 2012, p. 162.

How does the EU tackle demographic change?

The EU Sustainable Development Strategy (EU SDS) ([4]) dedicates one of its seven key challenges to demographic change, with the overall objective 'To create a socially inclusive society by taking into account solidarity between and within generations and to secure and increase the quality of life of citizens as a precondition for lasting individual well-being'.

The EU SDS operational objectives and targets:

- Supporting the Member States in their efforts to restructure social protection in view of demographic changes.
- Significantly increasing the labour market participation of older workers.
- Encouraging a more pro-active environment for female participation in the labour market.
- Attracting the participation and integration of migrants into the workforce.

Even though demographic change is not one of the main topics of the Europe 2020 strategy ([5]), two of the flagship initiatives under the sustainable growth priority refer to this issue:

- **Agenda for new skills and jobs**: No specific targets for older workers are set in the Europe 2020 strategy. To reach the objective of an employment rate of 75 % for women and men aged 20–64, labour market integration of underrepresented categories (such as older workers) has to be improved.
- **European platform against poverty and social exclusion**: The Europe 2020 strategy has set a target to lift at least 20 million people out of being at risk of poverty or social exclusion by 2020. The income level of pensioners is an indicator of the demographic change theme that is affected by this poverty target.

Further reading on demographic change

DG Employment, Social Affairs and Inclusion/Eurostat, *Demography Report 2010*, 2011.

Commission of the European Communities, *The demographic future of Europe — from challenge to opportunity*, 2006.

European Foundation for the Improvement of Living and Working Conditions, *Employment trends and policies for older workers in the recession*, 2013.

European Commission and Economic Policy Committee, *The 2012 Ageing Report: Economic and budgetary projections for the EU-27 Member States* (2010–2060), 2012.

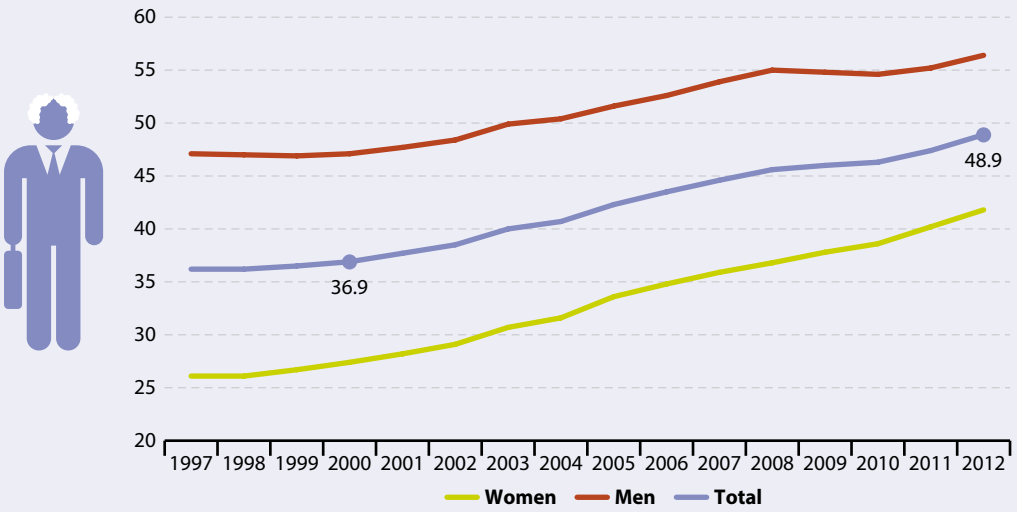
Eurostat, *Figures for the future*, 2012.

([4]) Council of the European Union, Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy, 10917/06, Brussels, 2006.
([5]) European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010.

Employment rate of older workers

12 percentage points increase in the proportion of 55 to 64 year olds in employment in the EU between 2000 and 2012. The economic crisis has not had an impact on the trend so far

Figure 4.1: Employment rate of older workers, EU-27
(%)



Source: Eurostat (online data code: tsdde100)

In 2012, 48.9 % of 55 to 64 year olds in the EU had been in employment compared with 36.9 % in 2000. This positive trend has persisted over the years for both men and women. The employment rate for older women increased steadily from 27.4 % in 2000 to 41.8 % in 2012. Over the same period, the rate of working men aged between 55 to 64 years increased from 47.1 % to 56.4 %.

Strong increase in the employment rate of 55 to 64 year old women

While the employment rate of women remained lower than that of men, the increase in that age group was clearly higher for women, at 14.4 percentage points since 2000, compared with 9.3 percentage points for men. Due to the strong increase in the employment rate of older women, the gap between men and women has closed over time.

Despite a significant increase, the employment rate of older workers in 2012 remained well below other groups. While less than 50 % of older workers were employed in 2012, the employment rate of prime-aged workers (aged 30 to 54) was 78.3 %. Increasing employment rates of older workers is a focus of policy actions, because this is seen as a promising answer to the demographic challenge of structural longevity ([6]).

([6]) European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2012*, Luxembourg: Publications Office of the European Union, 2012 (p. 57).

Box 4.1: Labour market participation of older workers in the EU SDS and the Europe 2020 strategy

Concerns about insufficient participation of older workers in the labour market were previously identified at the Lisbon European Council in 2000. The EU Sustainable Development Strategy also set the operational objective to 'increase the average EU employment rate among older women and men (55 to 64) to 50 % by 2010'.

There are no specific targets for older workers in the Europe 2020 strategy. Instead the group is mentioned in a more general way. To reach the target of an employment rate of 75 % for working population, labour market integration of older workers also has to be improved. Although the employment rate for older workers has grown significantly, it is still considerably below the level of other age groups. Hence people aged 55 to 64, especially women, are in the focus for progressing towards the Europe 2020 strategy's employment target ([7]).

Box 4.2: Policy reforms to maintain older workers in employment

Reform of pension systems may help to increase the proportion of older workers in employment. Reforms often focus on incentives to extend working lives and on penalties for early labour market withdrawal. Later retirement ages were introduced or planned in many Member States. Some of the measures with a direct age management focus are ([8]):

- Financial incentives to employers to keep older-aged workers in employment.
- Financial incentives to employers to assist the re-entry of older workers into the workforce.
- Financial incentives to employees to stay in employment longer.
- Gradual/phased/partial retirement schemes.
- Other options for flexible working for older workers.
- Awareness and information campaigns to promote a change of attitude towards older workers including government-sponsored 'age management best practice' company prizes.

Why did the economic crisis not affect older workers?

At the EU-27 level, the recession has not yet affected the proportion of older people in employment. An increase in the share of older workers in employment stopped temporarily during the period following the crisis. While the year-on-year increase was one percentage point or above between 2005 and 2008, it was only 0.4 percentage points in 2009 and 0.3 percentage points in 2010. In 2012 the rate of older workers increased again at a higher level of 1.5 percentage points per year.

Experience and better integration into the labour market may be a reason why older workers have been more resistant to the crisis. Older workers are also more likely to be on open-ended contracts. Still there is a risk that this positive trend could weaken in the future. Because older workers often tend to work in the public administration, health and education sectors, their jobs could be in danger due to future public spending cuts ([9]). This seems already be the case in Greece where since 2010 the employment rate of older workers has fallen to below the 2000 level.

([7]) European Commission, *Europe 2020 targets: employment rate target*
([8]) Eurofound, *Employment trends and policies for older workers in the recession*, 2012, p. 1 & 7.
([9]) Eurofound, *Employment trends and policies for older workers in the recession*, 2012, p. 1.

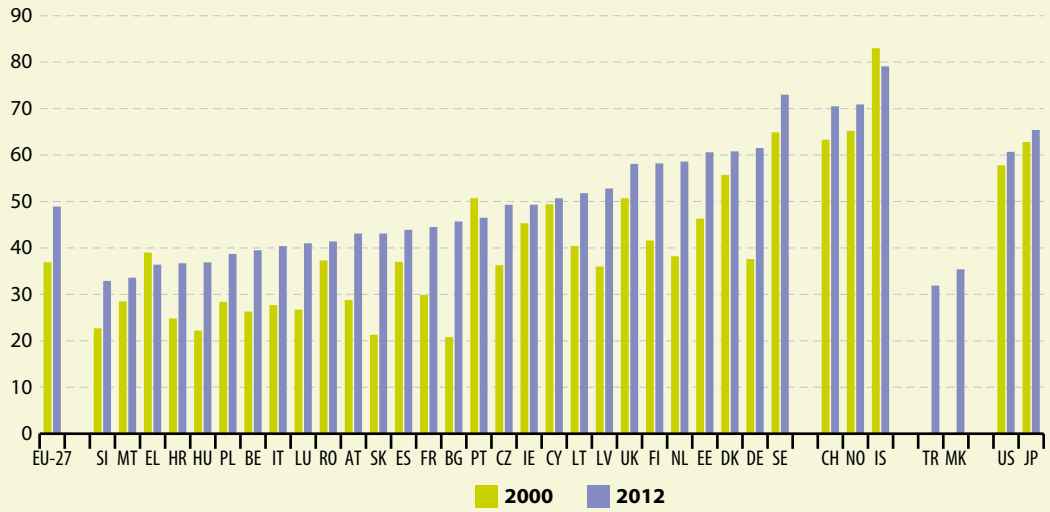
How the employment rate of older workers varies between Member States

Across EU Member States, employment rates of older workers have slightly converged since 2000. In 2012, they ranged from 32.9 % in Slovenia to 73.0 % in Sweden. Compared to the year 2000, with country rates between 20.8 % (Bulgaria) and 64.9 % (Sweden), the spread has fallen by four percentage points.

In 2012, 10 countries had an employment rate of older workers of 50 % or more. The other Member States, with less than half of their older workers in employment, still have yet to reach the EU SDS target of 2010. Countries with the largest percentage point increase on 2000 levels include Bulgaria, Germany and Slovakia. Between 2000 and 2012 employment rates of older workers fell in only two countries: Portugal and Greece.

This discrepancy between countries is the result of several factors such as different employment sectors, retirement ages and policy initiatives ([10]). Variations in policy reforms may also help to explain the differences. Incentives to work longer, the retirement age, opportunities for early and partial retirement and retention of older workers are some of the impacts explaining the different employment rates of older workers between countries. Furthermore, many Member States focused on continuous skills development (employability) and provided incentives to employees and employers to ensure lifelong learning ([11]).

Figure 4.2: Employment rate of older workers, by country
(%)



NB: 2002 data for RO and HR (instead of 2000), 2003 data for IS (instead of 2000); break in series for IT and AT (2004), DE, ES and SE (2005), IE and CY (2009), LT, NL, PL and CH (2010), BG, CZ, LV, PT and SK (2011)

Source: Eurostat (online date code: tsdde100)

EU trends in employment rate of older workers compared with other countries in the world

Compared with other countries, the EU-27 average employment rate of older workers is clearly lower than in the two G7 countries United States (US) and Japan. In 2012 the employment rate of older workers was 60.7 % in the US and 65.4 % in Japan. In both countries the rate was already higher in 2000 with 57.8 % in US and 62.8 % in Japan compared to the EU-27 average of 36.9 %. Among the Member States, seven countries (Germany, Denmark, Estonia, Finland, the Netherlands, Sweden and the United Kingdom) had similar employment rates of older workers to the US and Japan in 2012.

([10]) Hartlapp, M. and Schmid, G., *Employment risks and opportunities for an ageing workforce in the EU*, Berlin, Wissenschaftszentrum Berlin für Sozialforschung (WZB), Discussion Paper SP, 2008, 105.
([11]) Eurofound, *Employment trends and policies for older workers in the recession*, 2012, p. 8–9.

What lies beneath this indicator?

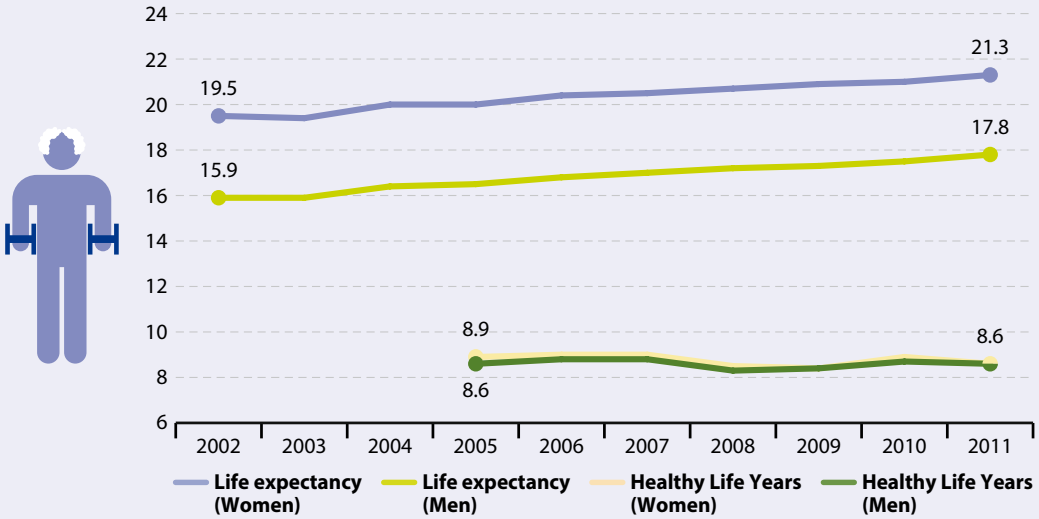
Participation of older people in the labour market indicates the adaptability of the EU labour market to population ageing. It also addresses in part how to provide adequate pensions and social protection systems to the elderly while guaranteeing healthy public finances. Either people will need to retire later in life and pension contributions will need to be increased, or pensions will need to be indexed with a demographic correction factor, which reduces the amount of pensions accordingly. Strategies to encourage a higher exit age from employment include life-long learning schemes providing workers with new skills demanded by the labour market.

The employment rate of older workers measures the proportion of persons in the 55 to 64 age group who were in employment. The employed population consists of those persons who, during the reference week, did any work for pay or profit for at least one hour, or were not working but had jobs from which they were temporarily absent.

Life expectancy at age 65

9 % increase in the life expectancy at age 65 for women and 12 % increase for men in the EU between 2002 and 2011. However, these improvements did not lead to a longer healthy life

Figure 4.3: Life expectancy and healthy life years at age 65, by sex, EU-27 (years)



NB: break in series in 2010; life expectancy: 2010 data are provisional, 2011 data are estimates; healthy life years: data for 2005, 2006 and 2011 are estimates

Source: Eurostat (online data codes: tsdde210 and tsdph220)

The expected number of years left to live at the age of 65 increased for men and women between 2002 and 2011. For women life expectancy at age 65 increased only slightly, but continuously, from 19.5 to 21.3 years. Life expectancy for men started from a lower level of 15.9 years in 2002 and reached 17.8 in 2011. The gap between men and women has been gradually reduced by 3 %. As the annual increase rate for women between 2002 and 2011 has gradually fallen to below 1 % it is unclear whether this positive trend will persist in the future. The rate of increase for men over the same period was 1.3 % per year.

Longer life but not in good health, especially for women

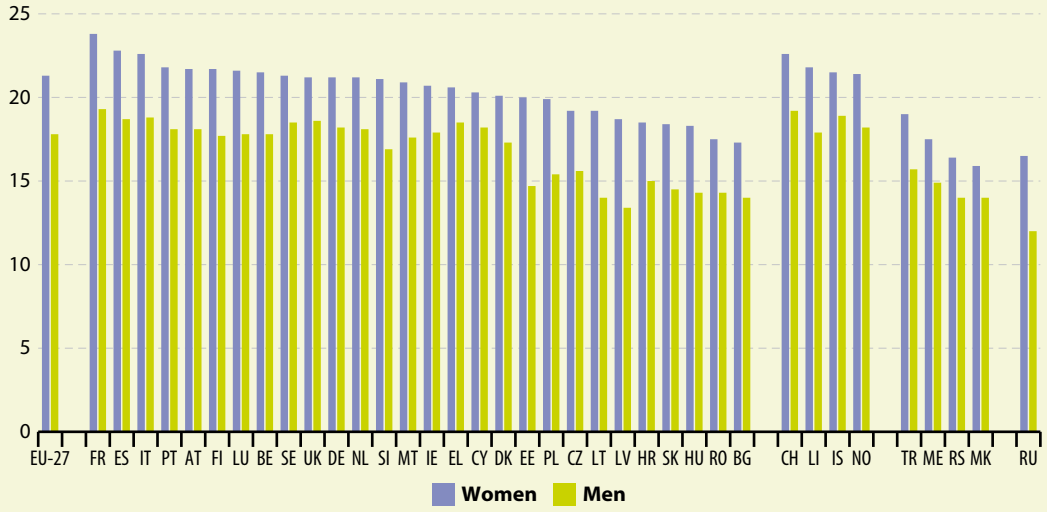
In spite of the increase in life expectancies, disability- or disease-free life expectancies have not improved. The number of 'healthy life years' remained stable for men and even decreased for women, by 0.3 years between 2005 and 2011.

In 2011 women at the age of 65 could expect to live another 21.3 years on average, 8.6 of which in good health. On average women spend the majority of the remaining years at the age of 65 with a disability or disease. Improvements in overall life expectancy did thus not lead to a higher number of healthy life years but to a higher number of years with a disability or disease.

How life expectancy at age 65 varies between Member States

Life expectancy at the age of 65 has diverged between Member States for both sexes. The rather lower levels of life expectancy in Eastern European countries have persisted up to 2011. In fact, the range between the lowest and the highest life expectancy at age 65 among the EU-27 has even increased, especially for men. Between 2002 and 2011 the range for women increased by 14 % and for men by 31 %. In 2011 the expected years to live for women ranged from 17.3 years in Bulgaria to 23.8 years in France. For men the lowest level was in Latvia with 13.4 years to live and the highest was in France with 19.3 years.

Figure 4.4: Life expectancy at age 65, by country, 2011
(years)



NB: 2009 data for RU; estimated data for EU-27, BE and IT, provisional data for RO.

Source: Eurostat (online data code: tsdde210)

Longer life expectancy and public spending

Medical progress and socioeconomic factors have reduced mortality in the past decades and are expected do so in the future. The impact of falling mortality rates of older people on the costs of public health depends on their health status. If longer life expectancy at age 65 is linked to an increasing number of healthy life years, longevity does not automatically lead to higher public spending. Also older people are not simply recipients of pensions, but provide a large proportion of care for other elderly people (for example spouses and relatives) ([12]).

What lies beneath this indicator?

The EU Sustainable Development Strategy encourages active and healthy ageing strategies as part of the actions to respond to 'social inclusion, demography and migration' challenges. Thus the indicator reflects improvements on wealth, nutrition and health care for older people.

It also reflects challenges for the sustainability of public finances as a result of ageing populations. Increased life expectancy — without a change in retirement age — implies more demand for pensions and health and long-term care.

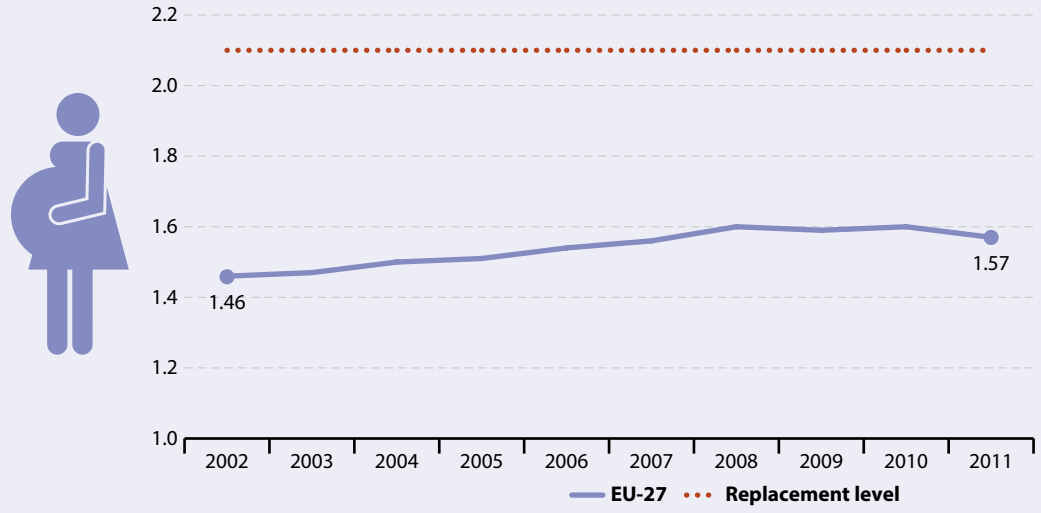
Life expectancy at age 65 is defined as the average number of years still to be lived by a woman or a man who has reached the age of 65, based on current mortality conditions (age-specific probabilities of dying).

([12]) Rechel, B., Y. Doyle, E. Grundy and M. McKe, *How can health systems respond to population ageing?*, Health Systems and Policy Analysis, WHO Regional Office for Europe and European Observatory on Health Systems and Policies, Policy Brief 10, p. 8.

Fertility rate

8 % increase in fertility rate in the EU between 2002 and 2011. Nevertheless after stabilising between 2008 and 2010 at 1.6 children per woman, the average number of births decreased slightly in 2011

Figure 4.5: Total fertility rate, EU-27
(number of children per woman)



NB: Break in series in 2010 and 2011; 2011 data are provisional.

Source: Eurostat (online data code: tsdde220)

The average fertility rate in the EU increased from 1.45 children per woman in 2002 to 1.57 in 2011. Despite the positive overall trend, the rate decreased slightly by about 2 % from 2010 to 2011. Whether this most recent development is a turnaround or just a temporary dip has to be observed in the future. Possibly uncertainty over future prospects due to the economic crisis have had a negative influence on individual decisions to bear children.

How fertility rates vary between Member States

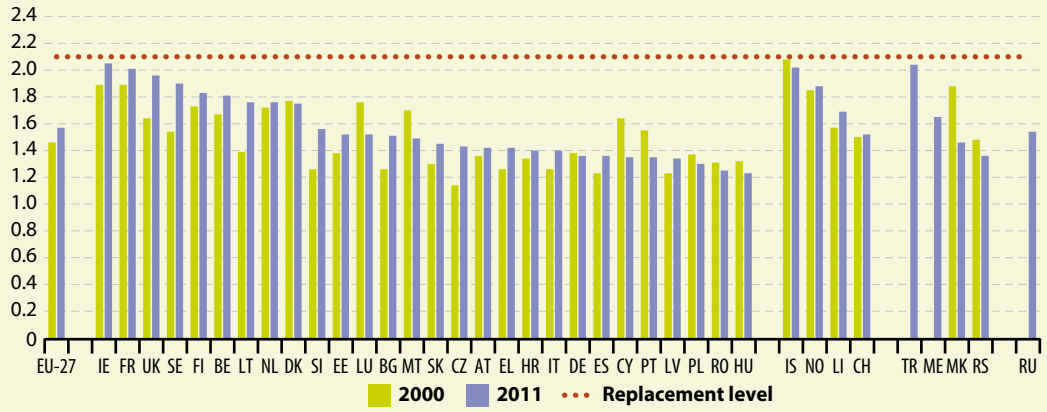
In 2011 Ireland (2.05), France (2.01) and the United Kingdom (1.96) had the highest fertility rates, which were very close to the replacement level of 2.1 children per woman. The lowest fertility rates were in the eastern countries Hungary (1.23), Romania (1.25) and Poland (1.3). Overall 19 Member States had a fertility rate below the EU average.

The fertility rate might be affected in various ways by the economic crisis. The impacts of the crisis on individual childbearing decisions may be softened by government interventions and therefore vary across Member States. Other factors such as education, migrant status and employment status may also mean some population groups feel the impacts of the crisis more strongly than others ([13]).

*To maintain the current population size, a fertility rate of 2.1 children per woman would be needed in the EU. This so-called **'replacement level'** necessary for population renewal has never been reached in the average of the EU-27 countries.*

([13]) Eurostat, *Towards a 'baby recession' in Europe? Differential fertility trends during the economic crisis*, 2013, p. 1.

Figure 4.6: Total fertility rate, by country
(number of children per woman)



NB: 2002 data (instead of 2000) for EU-27, HR and LV; 2009 data (instead of 2011) for RU, 2010 data (instead of 2011) for TR

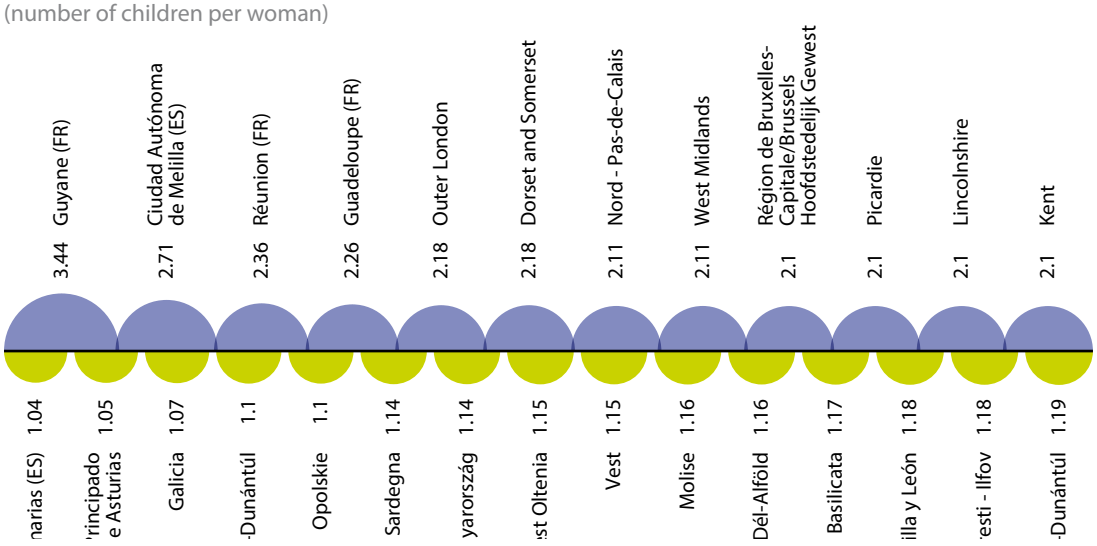
Source: Eurostat (online data code: tsdde220)

Regional disparities in fertility rates

The French overseas departments Guyane, Réunion and Guadeloupe as well as Pas-de-Calais and Picardie in northern France were among the European regions with the highest fertility rate. Among the same top 10 group were five regions of the United Kingdom, as well as the Spanish region Ciudad Autónoma de Melilla (located at the north coast of Morocco) and the capital region of Belgium, Région de Bruxelles-Capitale. The regions with the lowest fertility rates were in Eastern and Southern European Member States (Hungary, Romania, Poland, Spain and Italy).

The dispersion of fertility rates within countries is very low in some Member States, especially in countries with a small number of regions, such as Ireland and Croatia. Larger countries such as Greece, Spain, France and Italy show the highest regional dispersion of fertility rates among the EU-27.

Figure 4.7: Total fertility rate, by NUTS 2 regions
(number of children per woman)



NB: 2009 data for all regions in BE, 2010 data for all regions in IT, UK and TR

Source: Eurostat (online data code: demo_r_frate2)

More children due to changing family models?

Due to changing family models, the linkage between the birth of a child and marriage is weakening. The possibility of flexible and less traditional family-forming seems to have a positive impact on individual child-bearing decisions ([14]). An increasing number of children were born to unmarried women. Live births outside marriage increased from 27.4 % of total live births in 2000 to 39.5 % in 2011. Countries with a high rate of extramarital births even tend to have a higher fertility rate than others. For example, in Sweden, France, Denmark, the United Kingdom and Belgium fertility rates above the EU-27 average of 1.57 children per woman were combined with a rate of extramarital births above 45 % in 2011.

Box 4.3: 'Flexicurity' in the Europe 2020 strategy

The Europe 2020 strategy promotes the implementation of 'flexicurity' policies under the theme 'inclusive growth'. These policies focus on flexibility and security to modernise labour markets, enabling people to acquire new skills and adapt to new conditions and potential career shifts. In relation to the situation of families, they also include programmes facilitating the reconciliation of work and family life, such as access to childcare ([15]).

What lies beneath this indicator?

A fertility rate of 2.1 children per woman is considered necessary to maintain the population of developed countries at their existing levels. It is referred to as the replacement level. All other things remaining equal, a fertility rate below the replacement level will lead to a shrinking population and to a relative fall in the size of the working age population. Immigration could be an additional answer to a low fertility rate. On the other hand, a fertility rate above the replacement level would provide a potential solution to the expected future unsustainability of pensions, health and long-term care expenditure. However, high fertility rates may lead to over-population and place additional pressures on the environment and resource base.

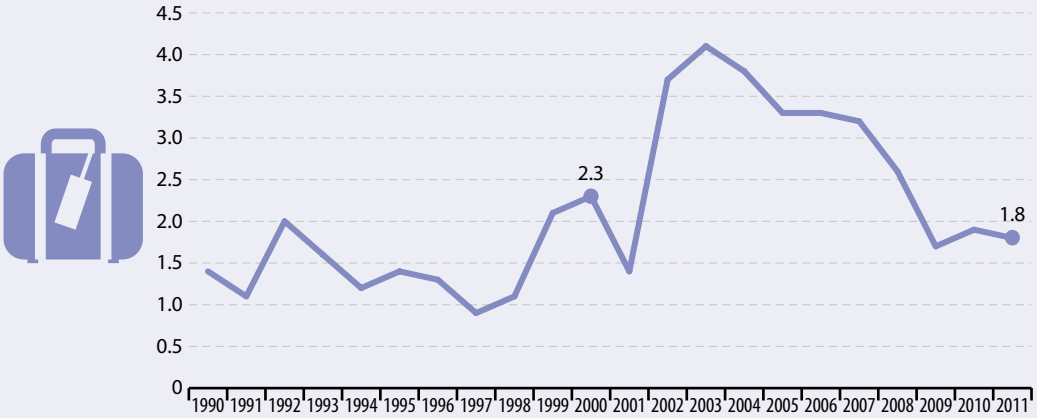
The indicator is defined as the mean number of children that would be born alive to a woman during her lifetime, if she were to pass through her childbearing years conforming to the fertility rates by age of a given year. This rate is, therefore, the completed fertility of a hypothetical generation, computed by adding the fertility rates by age for women in a given year.

([14]) DG Employment, Social Affairs and Inclusion/Eurostat, *Demography Report 2010: Older, more numerous and diverse Europeans*, 2011, p. 70.
([15]) European Commission, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM(2010) 682 final.

Migration

One quarter decrease in net rate of migration in the EU between 2000 and 2011. It is unclear whether the downward trend due to the economic crises has already drawn to a halt

Figure 4.8: Crude rate of net migration plus adjustment, EU-27
(per 1 000 inhabitants)



NB: break in series in 1998, 2007, 2010 and 2011; data for 2001–2011 are provisional.

Source: Eurostat (online data code: tsdde230)

The difference between immigration and emigration has decreased from a level of 2.3 migrants per thousand inhabitants in 2000 to 1.8 in 2011. After increasing steeply between 2001 and 2003, the rate has been falling since 2004, with a short interruption in 2010. The economic crisis, by reducing the number of job offers in the EU, was probably the driver behind this downward trend. Because many people move to the EU for work, the lack of labour demand influences the amount of people entering the Member States.

Not all Member States had decreasing net migration rates. Cyprus and Luxembourg even had a very high rate of 21.3 and 21.2 migrants per 1 000 persons in 2011. Because these two countries have a very small population size, migration flows are relatively large compared with the total population. In nine Member States (Bulgaria, Estonia, Croatia, Ireland, Lithuania, Latvia, Poland, Portugal and Romania) emigration was higher than immigration in 2011.

What lies beneath this indicator?

The EU Sustainable Development Strategy recognises the contribution that positive net migration makes to meeting the challenge of demographic change. It also emphasises the need for migration policies that attract skilled foreign workers, strengthens integration and facilitate access to the labour market for migrants and their families.

Migrants who are economically productive contribute to the economy in terms of labour and taxes, but there is a risk in relying too heavily on migrant workers to attain public finance sustainability. Through the direction of the Stockholm Programme, the EU Member States have agreed to a set of guidelines to converge country variations through policies, including cooperation to satisfy labour market demands, and to work more closely with non-EU countries to organise migration flows ([16]).

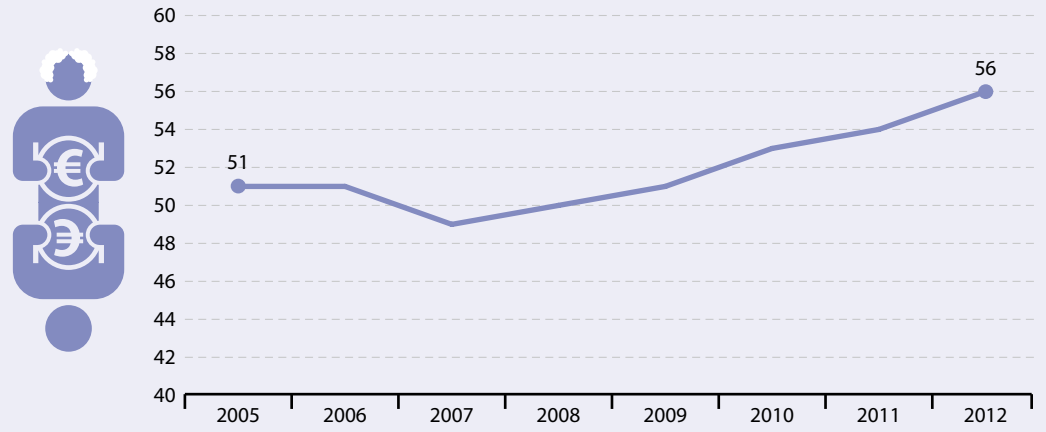
The indicator is defined as the ratio of net migration during the year to the average population in that year, expressed per 1 000 inhabitants. The crude rate of net migration is the difference between the crude rate of increase and the crude rate of natural increase — that is, net migration is considered the part of the total population change that is not attributable to births and deaths.

([16]) European Council, *The Stockholm Programme: An Open and Secure Europe Serving the Citizen*, Official Journal of the European Union, C 115, 4 May 2010.

Income level of over-65s compared to before

10 % increase in the ratio of income levels from pensions of elderly people relative to the income level from earnings of those aged 50 to 59 between 2005 and 2012. Since 2007 the ratio has been rising steadily

Figure 4.9: Aggregate replacement ratio, EU-27
(%)



NB: 2005, 2006 and 2012 data are estimates.

Source: Eurostat (online data code: tsdde310)

The aggregate replacement ratio — the median income level of pensioners aged between 65 and 74 compared with the income of the working population in their 50s — has increased from 51 % in 2005 to 56 % in 2012. During this period there was only a slight dip to 49 % in 2007.

Over the past decade some Member States have reformed their pension systems to prevent pension expenditure increasing as a share of GDP ([17]). Facing the pressure on pension funds due to demographic change and the economic crisis, it is very unlikely that elderly people would in fact receive higher pensions. The increase in the replacement ratio might rather depend on the lower incomes of the working population due to the recession.

Older people aged 65 and above are less at risk of poverty

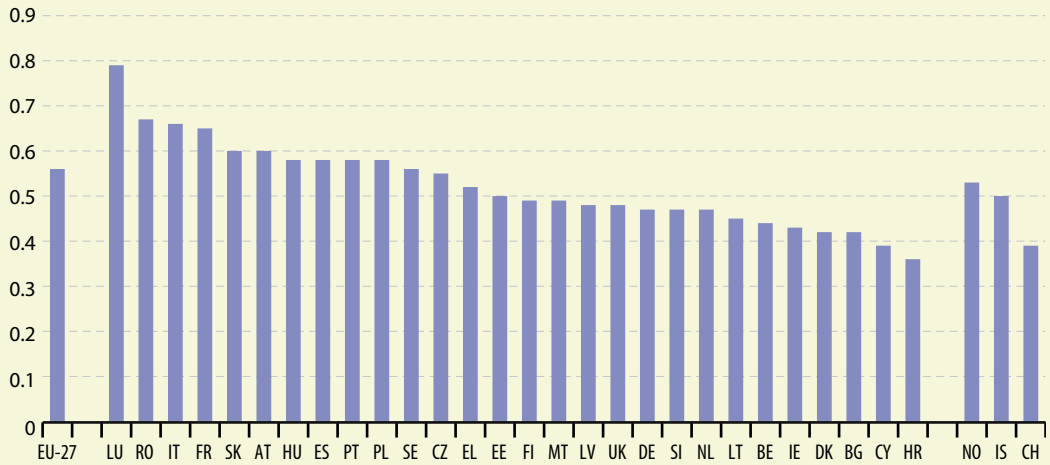
Despite the economic crisis, the share of people at risk of poverty or social exclusion among older people aged 65 and above has fallen continuously since 2005. Compared with other age groups, in 2012 older people showed lower poverty or social exclusion rates, at a level of 19.5 % (16.3 % for men and 22.0 % for women). In contrast, young people aged 18 to 24 have been increasingly affected by the risk of poverty and social exclusion. Thus, the age gap has widened over the past years.

How income level of over-65s compared to before varies between Member States

In 2012, the replacement ratio in the 27 EU Member States ranged from 39 % in Cyprus to 79 % in Luxembourg. Compared to the year 2005, when country rates were between 29 % (Cyprus) and 68 % (Austria), disparities across the EU have increased slightly, by one percentage point. In 2012, Luxembourg, Romania (67 % each) and Italy (66 %) had the highest relative income levels of the over-65s, while Denmark, Bulgaria and Cyprus (42 %, 42 % and 39 % respectively) had the lowest.

([17]) Joint Report on Pensions: Progress and key challenges in the delivery of adequate and sustainable pensions in Europe, *European Economy*, Occasional Papers 71, November 2010.

Figure 4.10: Aggregate replacement ratio by sex, by country, 2012
(%)



NB: 2011 data for BE, IE, AT, UK and CH; data are estimates (EU-27) or provisional (IT).

Source: Eurostat (online data code: tsdde310)

What lies beneath this indicator?

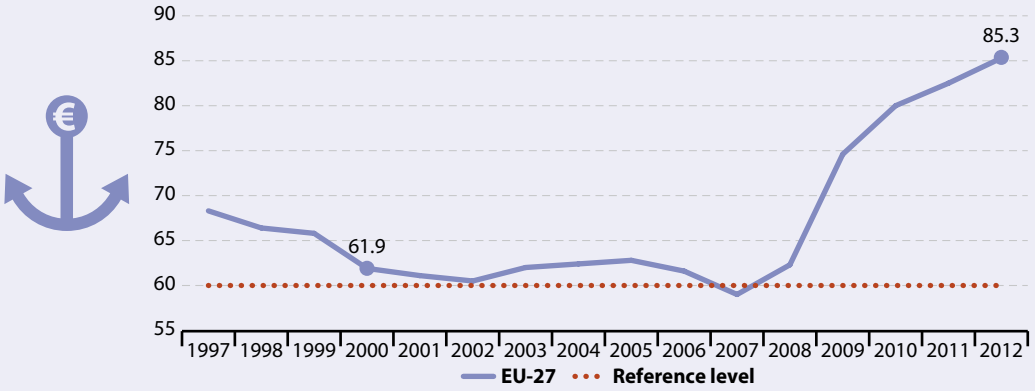
The EU Sustainable Development Strategy underlines the importance of the adequacy of pensions in the framework of social inclusion. Thus the indicator is linked to the overall objective of securing and increasing the quality of life of citizens as a precondition for lasting individual well-being. The Europe 2020 strategy has set a target to lift at least 20 million people out of the risk of poverty and social exclusion by 2020. The income level of pensioners is one of the factors that determine their risk of poverty and social exclusion. In this regard the aggregate replacement ratio is an important indicator to monitor these risks for the older population living on their pension.

The indicator compares pensioner incomes with the work earnings of people in the decade before retirement. It is defined as the ratio of the median individual gross pensions of 65 to 74 year olds relative to median individual gross earnings of 50 to 59 year olds. Other social benefits are excluded. EU aggregate figures represent the average of the national values, weighted by their population.

Public debt

More than a one third increase in public debt in the EU between 2000 and 2012. No recovery since the onset of the economic crisis

Figure 4.11: General government gross debt, EU-27
(% of GDP)



Source: Eurostat (online data code: tsdde410)

Between 2000 and 2007 public debt in the EU was close to the reference level of 60 % of GDP, reaching its lowest point of 59 % at the end of this period. With the emergence of the economic crisis, a distinctive turnaround took place. Between 2007 and 2012 public debt increased considerably by 26.3 percentage points, reaching 85.3 %.

To combat the recession, many Member States adopted expansionary and counter-cyclical fiscal policies. Banks and other sectors were temporarily, and sometimes considerably, supported with state aid, which led to immense public spending. Because high levels of public debt are not sustainable in the long term, the Europe 2020 strategy calls for a coordinated exit from the state aid framework (see Box 4.4).

Box 4.4: Europe 2020 — Defining a credible exit strategy

Referring to the high levels of public debt and the sustainable development of public finance, a coordinated strategy to exit from the temporary state aid framework is formulated in Europe 2020. Such a coordinated approach would need to rely on the following principles ([18]):

- The withdrawal of the fiscal stimulus should begin as soon as the recovery is on a firm footing. However, the timing may have to differ from country to country, hence the need for a high degree of coordination at European level.
- Short-term unemployment support should only start to be phased out once a turning point in GDP growth can be regarded as firmly established and thus employment, with its usual lag, will have started to grow.
- Sectoral support schemes should be phased out early as they carry large budget costs, are considered to have by and large achieved their objectives, and due to their possible distorting effects on the single market.
- Access-to-finance support should continue until there are clear signs that financing conditions for business have broadly returned to normal.
- Withdrawal of support to the financial sector, starting with government guarantee schemes, will depend on the state of the economy overall and of the stability of the financial system in particular.

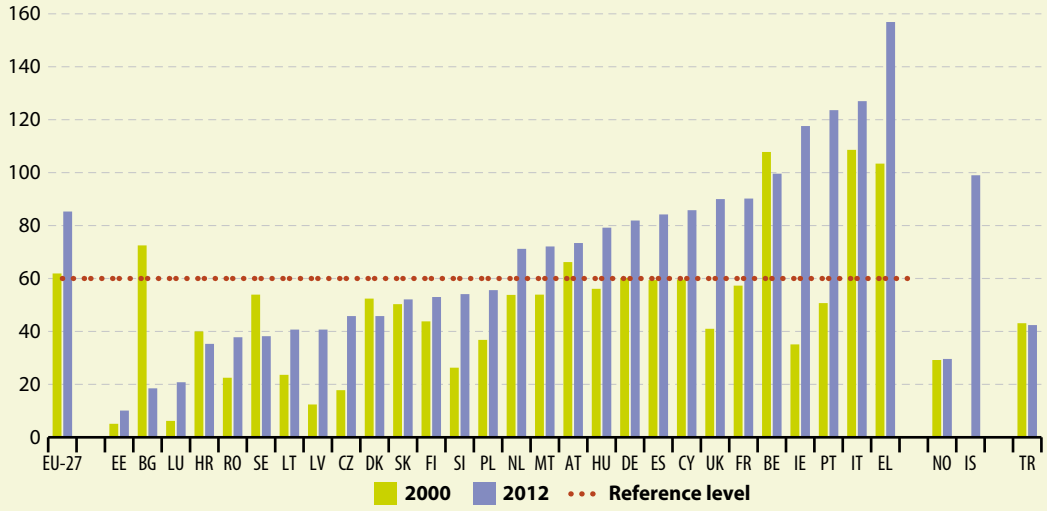
([18]) European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010 (p. 25).

How public debt varies between Member States

General government debt-to-GDP ratios within Member States in 2012 ranged from 10.1 % in Estonia to 156.9 % in Greece. Compared to 2000, the range between the lowest and the highest level has increased by more than 40 %. Fourteen Member States (Belgium, Germany, Ireland, Greece, Spain, France, Italy, Cyprus, Hungary, Malta, Netherlands, Austria, Portugal, United Kingdom) also remained above the 60 % eurozone reference line in 2012. In the years running up to the financial crisis, those countries that faced the greatest deterioration in public finances had a mixture of external imbalances along with booming credit and domestic demand, while the countries that experienced the smallest had shown stable or falling macroeconomic risks ([19]).

Over the period 2000 to 2012, general government debt-to-GDP ratios rose in more than 80 % of the Member States. Of the countries that were able to reduce their public debt, Bulgaria had the most pronounced decline with 54 percentage points over the period.

Figure 4.12: General government gross debt, by country
(% of GDP)



NB: 2001 data (instead of 2000) for NO, 2002 data (instead of 2000) and 2009 data (instead of 2012) for HR, 2010 data (instead of 2012) for TR.

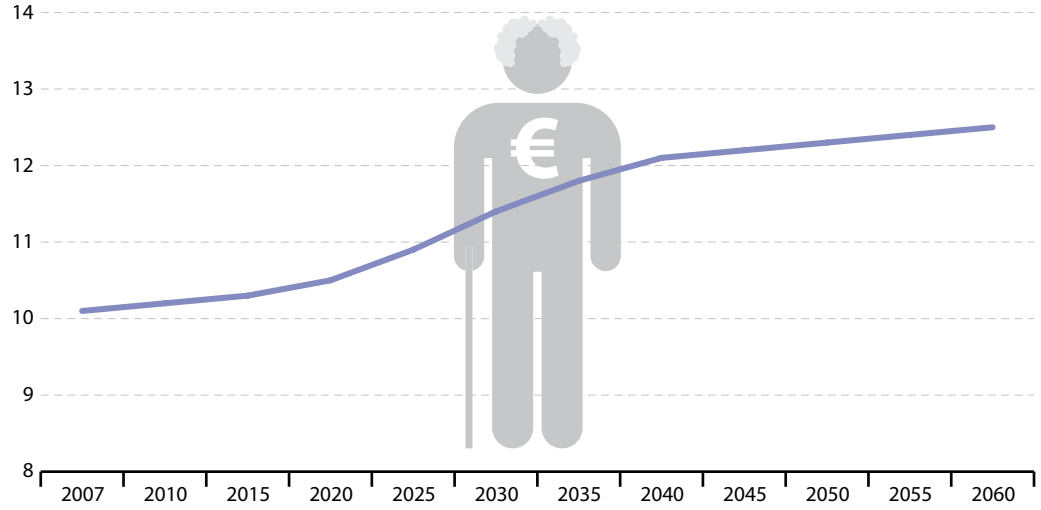
Source: Eurostat (online data code tsdde410)

Pension expenditure in the EU is projected to rise over the next decades

An important factor of age-related public spending is the expenditure on pension systems. With the ratio of elderly people to the working age population in the EU projected to increase, pension expenditure will probably have an even stronger impact on total public expenditure of the EU and, consequently, on public debt in the future. Over the period 2007 to 2060 public expenditure on pensions is projected to increase from 10.1 % of GDP to 12.5 % of GDP.

([19]) European Commission, *Public Finances in EMU-2010*, European Economy. No 4/2010.

Figure 4.13: Pension expenditure projections (baseline scenario), EU-27
(% of GDP)

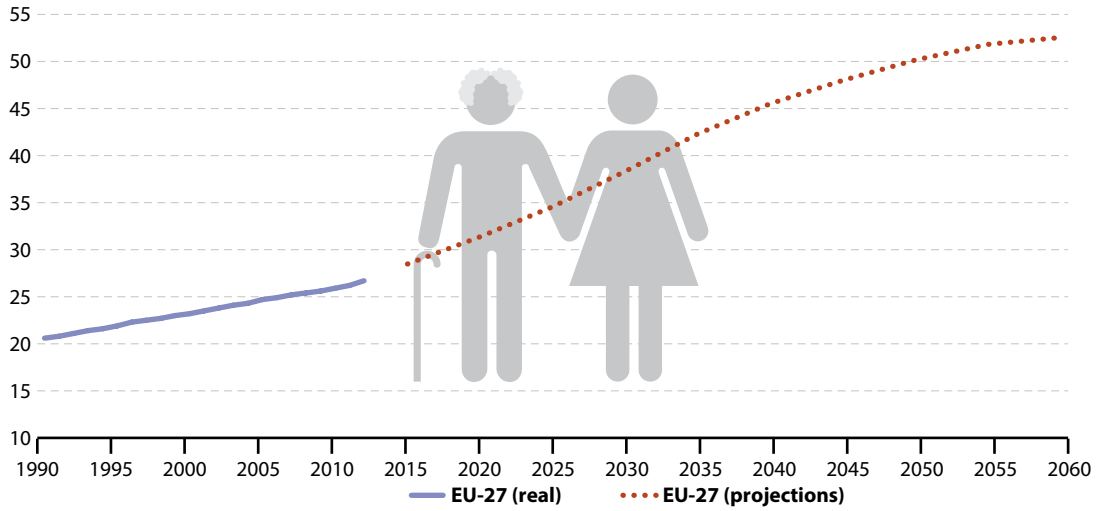


Source: Economic Policy Committee (online data code: tsdde520)

Old-age dependency expected to keep rising until 2050

Population ageing is a major driver of the expected increase in pension expenditure. The trend towards a growing share of older people aged 65 and above in the population and a shrinking working-age population (15 to 64 years) has long been observed, and is expected to accelerate in the future. The ratio of elderly people to the working age population in the EU has steadily increased from 24.5 % in 2000 to 25.8 % in 2012. Projections indicate that the old-age dependency ratio will continue to increase, reaching 51.8 % in 2055, or about double the level of 2012. The share of people aged 65 and above in the total population is projected to increase from 17.5 % in 2011 to 29.5 % by 2060.

Figure 4.14: Old-age-dependency ratio, EU-27
(%)



NB: Data for 2015–2060 are projections based on EUROPOP 2010 convergence scenario.

Source: Eurostat (online data codes: tsdde510 and tsdde511)

What lies beneath this indicator?

The indicator monitors progress towards the EU reference value for public debt of 60 % of GDP. Public debt should be brought below this level by raising employment rates and productivity, and reforming health and long-term care systems, without compromising welfare expenditure. The EU Sustainable Development Strategy supports Member States' efforts to modernise social protection systems and ensure their sustainability. General government debt as a percentage of GDP reflects the health of public finances. This is essential to meet the increasing needs of ageing populations and to promote economic growth. It is also essential to prevent debt being handed down to future generations, other nations' taxpayers or to expropriate bondholders through sovereign default.

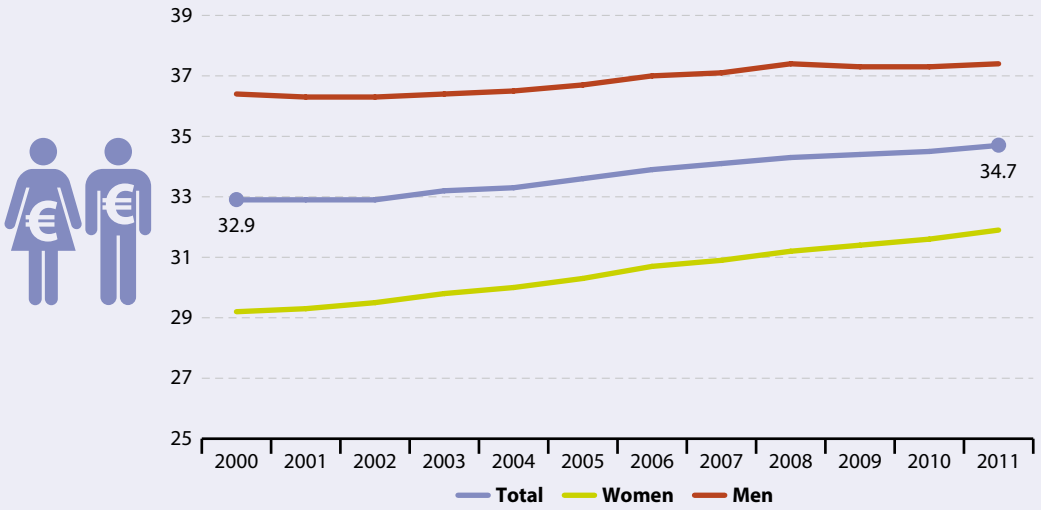
The indicator is defined (in the Maastricht Treaty ([20])) as general government gross debt as a percentage of GDP at current market prices. Gross debt refers to the stock of amounts borrowed by the general government (state, local government and social security funds) to support its financing requirements. The general government sector comprises the subsectors of central government, state government, local government and social security funds. Basic data are expressed in national currencies, converted into EUR using end-year exchange rates. Not all public debt is observable because some countries have transferred debt to public entities — such as state-owned railways, airlines, motorways, banks — established under private law.

([20]) The Maastricht Treaty, 1992.

Retirement

1.8 years increase in duration of working life in the EU between 2000 and 2011. Women have been slowly but continuously catching up with men

Figure 4.15: Duration of working life, by sex, EU-27
(years)



NB: Data calculated with probabilistic model combining demographic data and labour market data.

Source: Eurostat (online data code: tsdde420)

The number of years a person is expected to be active in the labour market throughout their life slightly increased between 2000 and 2011 for men and women.

Working life of women catching up to that of men

For women the duration of working life continuously increased from 29.2 to 31.9 years between 2000 and 2011. The expected working life for men started from a higher level of 36.4 years in 2000 and slightly increased to 37.4 years in 2011. A convergence in the duration of working life between the two sexes is visible over the time. The gap between men and women has been reduced by 1.7 years.

Narrowing the gap in working life of women between Member States

For women, the duration of working life has also converged between Member States. Since 2000, the range of female working lives between the countries has decreased by 2.2 years. In comparison the range for men remained stable over the same period. In 2011 the expected working life of women ranged from 22.3 years in Malta to 39 years in Sweden. For men the lowest level was in Hungary with 31.8 years and the highest was in the Netherlands with 41.7 years. In seven countries (Greece, Ireland, Italy, Lithuania, Malta, Portugal, Romania) the duration of working life for men decreased between 2000 and 2011. Romania is the only Member State where the expected years to work for women has decreased as well (by 5.1 years).

What lies beneath this indicator?

The EU Sustainable Development Strategy stresses the importance of 'solidarity between and within generations' to the overall objective of addressing the 'social inclusion, demography and migration' challenge. The average exit from the labour market reflects whether the EU is shifting towards longer working lives, which are essential to ensure the sustainability and adequacy of pension systems and health and long-term care.

The duration of working life indicator measures the number of years a person aged 15 is expected to be active in the labour market throughout his or her life.

5

Public health

Public health seen through the lens of Quality of Life

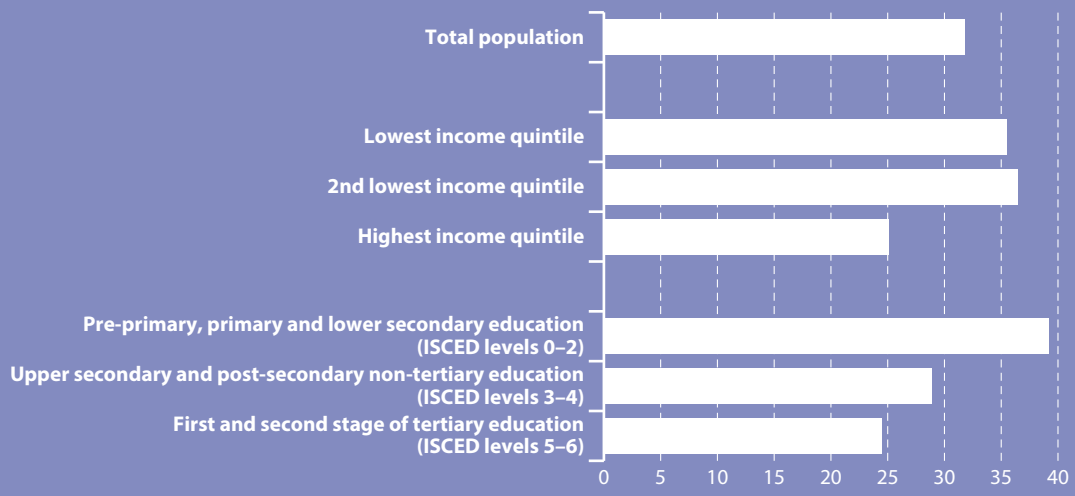
Long-standing illnesses — gender, income and education matter

Healthy life is fundamental for well-being and for full participation in society. Being intrinsically important, health is also a factor for social cohesion and economic development through improving work participation and productivity.

In 2011, 31.7 % of the European population was suffering from a long-standing illness or health problem; about one percentage point higher than in 2005. The highest incidence of long-term health problems was observed in Finland (45.1 %) and Estonia (44.7 %) and the lowest in Bulgaria (18.1 %), Romania (20.8 %) and Luxemburg (20.8 %).

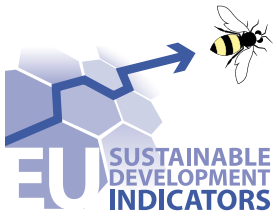
The health status of the population varies by income, gender and education. The proportion of the European population having a long-standing health problem is highest for the lowest two income quintiles (35.6 % for the first and 36.4 % for the second quintile in 2011) and lowest for the top income quintile (25.1 %). Long-term health problems in the EU are much more common among women (33.8 %) than men (29.4 %) and among those with pre-primary, primary and lower secondary education (39.4 %) as compared to those with upper-secondary (28.9 %) and tertiary education (24.6 %).

People having a long-standing illness or health problem, EU-27, 2011
(% of population)



NB: Estimated data.

Source: Eurostat (online data codes: hlth_silc_05 and hlth_silc_11)



Overview of main changes

Public health indicators are strongly linked to economic activity. The nature of this interlinkage depends on the respective indicator group. The headline indicators of life expectancy and healthy life years as well as the sub-indicators on health and health inequalities improve with economic growth. This can be observed over time, during economic crises and across countries. In general life expectancy is increasing over time and improvements in the reduction of deaths due to chronic diseases, suicides and access to health care since 2000 are visible. During the current economic crisis a reversal of the downward trend can be observed for the suicide death rate and the number of people reporting problems of access to health care. Furthermore the sub-indicators production of toxic chemicals, exposure to air pollution by particulate matter and ozone, being negative determinants of health, can increase with economic activity or production growth respectively. This implies that economic growth can have both positive and negative effects on public health and points out to the importance of the sustainability of economic growth.

Table 5.1: Evaluation of changes in the public health theme (EU-27, from 2000) (1)

Level 1	Level 2	Level 3
	Health and health inequalities	
Life expectancy and healthy life years (*)	Deaths due to chronic diseases	Suicides
		: Unmet needs for healthcare
	Determinants of health	
	Production of toxic chemicals (**)	Exposure to air pollution by particulate matter
		Exposure to air pollution by ozone

(*) From 2004. (**) From 2002.

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.

Why do we deal with public health?

Healthy people represent added value for the economy and social development since they are more productive and can contribute to cohesive ways of living together in society. Thus, sustainable development cannot be ensured in societies affected by widespread disease.

There are different public health threats or challenges faced by countries in different levels of their development. While "traditional health threats" are associated with lack of development, "modern health threats" are associated with rapid development that lacks health and environmental safeguards and unsustainable consumption of natural resources. Modern hazards include, for example, water and air pollution, intense industry and agriculture, hazardous waste accumulation, chemical and radiation hazards, emerging and re-emerging infectious diseases as well as chronic diseases ([2]) but also social conditions such as income inequality, unemployment, bad education or social isolation.

One of the major challenges about modern health threats for policy makers is that a long period may pass before the effects on health manifest themselves. For example, a cancer-causing chemical released into the environment today may not reach a person until it has passed through the food chain for months or years. Therefore for modern environmental and social health hazards, understanding the pathways through which the hazards move is particularly important.

There is a strong linkage between health and other sustainable development related issues. As outlined above, health is affected by environmental issues related to climate change and energy (such as greenhouse gas emissions), sustainable transport (for example people killed in road accidents), sustainable production and consumption (for example atmospheric emissions) and the management of natural resources. Secondly socioeconomic development and social cohesion, leading to improved living conditions and reduction of inequalities, also greatly contribute towards better health. For poorer people cost may be an obstacle to gaining access to health services and leading a healthy lifestyle. In general socially included people benefit from the support of their environment and finally economic activity or employment is often a prerequisite for mental health stability. These issues are addressed in the EU Sustainable Development Strategy's key challenges of 'social inclusion, demography and migration' and 'fighting global poverty'.

How does the EU tackle public health?

The protection from health threats is an explicit objective in the EU Sustainable Development Strategy (EU SDS) ([3]). 'Public health' is one of seven key challenges of the strategy, with the overall objective to 'promote good public health on equal conditions and improve protection against health threats'. At the global level, the Agenda 21 adopted at the 1992 Rio Earth Summit ([4]) has been one of the most significant points in establishing an international policy framework for health in sustainable development.

Promoting good health is furthermore an integral part of Europe 2020 ([5]), being particularly important for the strategy's priorities of smart and inclusive growth. It is specifically addressed through the European Innovation Partnership on Active and Healthy Ageing ([6]). This pilot scheme aims to increase the average healthy lifespan of Europeans by two years by 2020.

Additionally, the EU health strategy 'Together for Health' ([7]) supports the overall Europe 2020 strategy. The EU health strategy is based on the four core principles (i) shared health values, (ii) health is the greatest wealth, (iii) health in all policies, (iv) strengthening the EU's voice in global health and puts forth the following three main objectives:

- Fostering good health in an aging Europe.
- Protecting citizens from health threats.
- Supporting dynamic health systems and new technologies.

([2]) Corvalán et al., *Health, environment and sustainable development: identifying links and indicators to promote action*, Epidemiology 1999, 10: 656–660.
([3]) Council of the European Union, *2009 Review of the EU Sustainable Development Strategy — Presidency report*, 16818/09.
([4]) United Nations, *Agenda 21: The United Nations Programme of Action from Rio*, New York, United Nations, 1992.
([5]) Commission Communication, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final.
([6]) http://ec.europa.eu/health/ageing/innovation/index_en.htm.
([7]) http://ec.europa.eu/health/strategy/policy/index_en.htm.

Further reading on public health

Colombo, F. et al., *Help Wanted Providing and Paying for long-term Care, OECD Health Policy Studies*, OECD Publishing, 2011.

European Commission, *Solidarity in health: reducing health inequalities in the EU*, COM(2009) 567 final.

European Commission, *Report on Health Inequalities in the European Union*, SWD(2013) 328 final.

OECD, *Health at a glance: Europe 2012*, OECD Publishing, 2012.

Seke et al., *Sustainable development and public health: rating European countries*. BMC Public health 2013, 13:77.

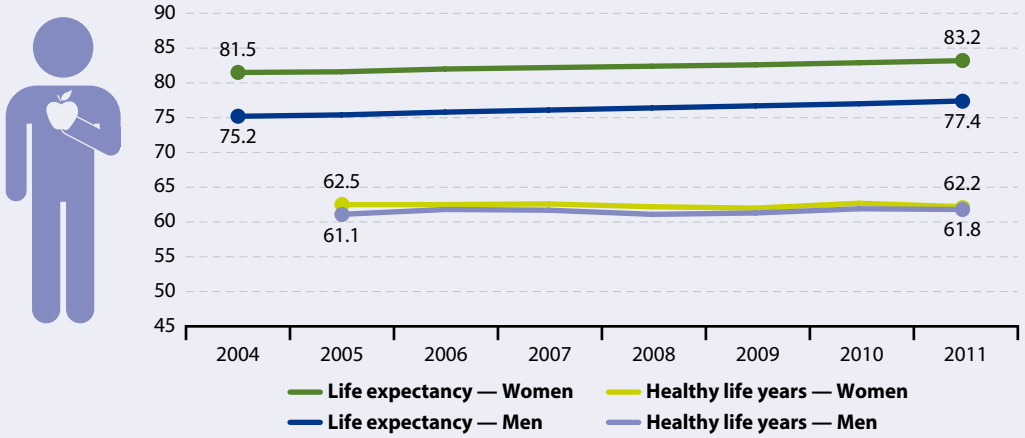
WHO, *Health and Sustainable Development. Key health trends*, 2002.

Corvalán et al., *Health, environment and sustainable development: identifying links and indicators to promote action*. Epidemiology 1999, 10: 656-660.

Life expectancy and healthy life years

1.7 years (women) and 2.2 years (men) increase in life expectancy in the EU between 2004 and 2011. However, people do not necessarily live longer in good health

Figure 5.1: Life expectancy and healthy life years at birth, by sex, EU-27 (years)



NB: Life expectancy: break in series in 2010, 2010 data are provisional, 2011 data are estimates; Healthy life years: data for 2005, 2006 and 2011 are estimates.

Source: Eurostat (online data code: tsdph100)

In 2004 the average number of years women could expect to live at their birth in the EU was 81.5. This was 6.3 more years than men could expect. Between 2004 and 2011 life expectancy for both women and men increased moderately. The increase was slightly stronger for men with an annual growth rate of 0.4 % compared to 0.3 % for women. This development indicates that the gap in life expectancy between women and men is closing over time.

Women live longer than men but spend more of their life with a disability or disease

In contrast to overall life expectancy, the disability- or disease-free life expectancy, which is measured by the number of healthy life years, does not show the gap between women and men. In 2011 women could expect to spend 62.2 healthy years in their life. The expectancy of healthy life years for men was with 61.8 years not much smaller. Consequently, as women's overall life expectancy is considerably longer than men's and the disability- or disease-free life expectancy of women and men are almost the same, women spend a greater share of their lives with a disability or a disease.

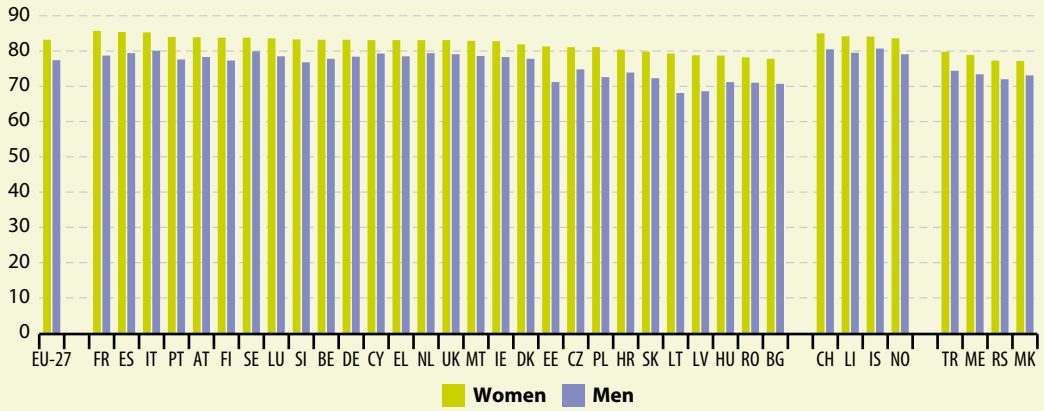
The number of healthy life years did not experience any improvement for women and only a slight one for men. The average annual percentage change was –0.1 % for women and 0.2 % for men. With higher growth rates in overall life expectancy and lower growth rates in healthy life years, this means that people on average do not spend all of the additionally gained life years in good health but with some kind of disability or disease.

How life expectancy and healthy life years vary between Member States

Women had the highest life expectancy in France (85.7) where they became on average 2.5 years older than the EU average and almost eight years older than in Bulgaria, which is the country in Europe with the lowest life expectancy. In 2011 there were nine Member States from Eastern Europe where the life expectancy of women was still lower than the EU average of 2004.

For men, the disparities in life expectancy between countries are even larger. In 2011 men lived the longest in Italy (80.1 years) and were on average 2.7 years older than the EU average and 12 years older than in the country with the lowest life expectancy for men, which is Lithuania with 68.1 years. In the same nine Eastern European countries as above the life expectancies for men in 2011 were still lower than the EU average of 2004. The reasons for the lower life expectancies in these Eastern European countries are mostly poorer socioeconomic conditions combining with poorer nutrition, worse health literacy or stress as well as higher unemployment rates that may for example be associated with high risk alcohol consumption.

Figure 5.2: Life expectancy at birth, by sex, by country, 2011
(years)

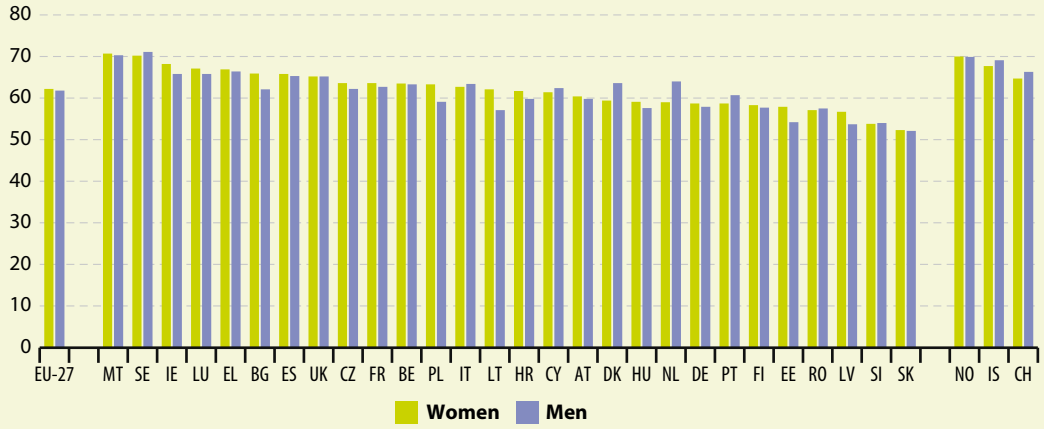


NB: Data for EU-27, BE, IT are estimates; data for RO are provisional; 2009 data for TR and RU.

Source: Eurostat (online data code: tsdph100)

Disparities between the EU countries are even higher with respect to healthy life years ([8]). The country with the highest number of healthy life years is Malta; in this country, women and men can expect to spend 8.5 more years of their lives in good health than on average in the EU. On the other end of the scale, people in Slovakia spend about 10 fewer years in good health than people do on average in the EU. Hence comparing the first and the last country reveals a county gap in healthy life years across the EU of over 18 years.

Figure 5.3: Healthy life years at birth, by sex, by country, 2011
(years)



NB: Data for EU-27, BE, IT and NO are estimates.

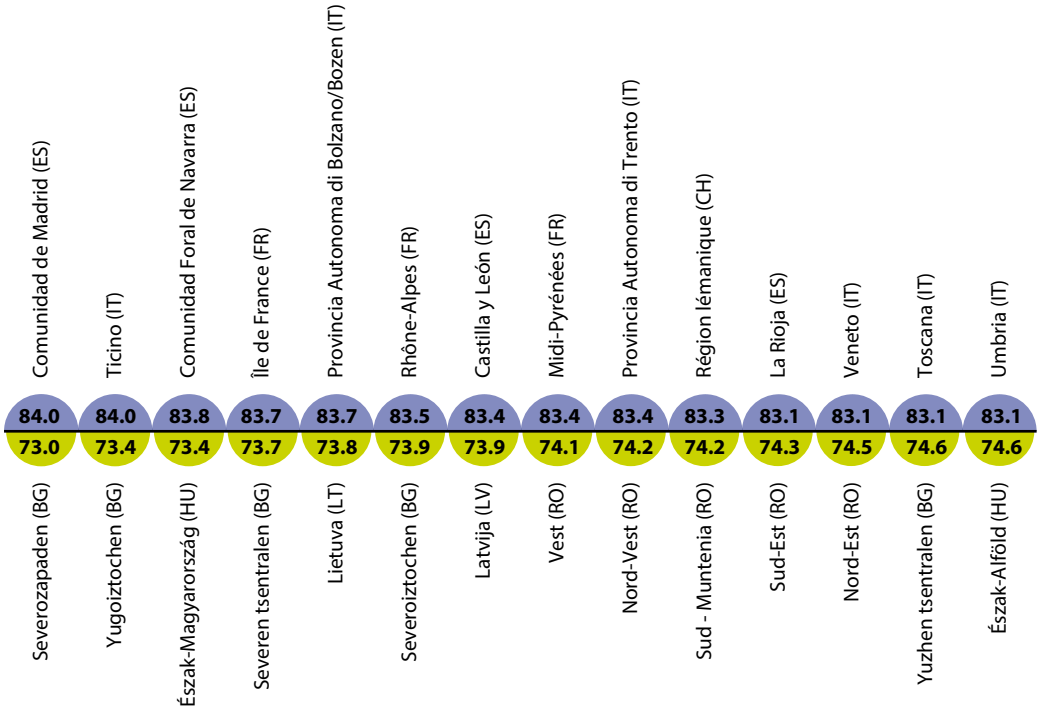
Source: Eurostat (online data code: tsdph100)

([8]) The county breakdown of the indicator healthy life years must be handled with care as treatment and use of medical care as well as mortality registration methods may vary across countries,

Regional disparities in life expectancy

The top 10 EU regions with respect to life expectancy are all located in countries heading the life-expectancy-list (France, Spain, Italy) and are either urban regions like the greater cities of Madrid and Paris (Île de France) or wine-growing districts. The bottom 10 regions are located in Bulgaria (the wheat-growing northern regions of Severozapaden, Severna and Yugoiztochna Bulgaria, Severen tsentralen and Severoiztochen and the southeastern district Yugoiztochen), Latvia, Lithuania, Romania (Vest, Sud-Muntenia,Sud-Est, Nord-vest, Macroregiunea doi, Macroregiunea patru) and Hungary (the north and north-eastern districts of Alföld és Észak, Észak-Magyarország and Észak-Alföld) where life expectancies at the national level are the lowest within Europe.

Figure 5.4: Life expectancy at birth, by region, 2011
(years)



NB: 2010 data for all regions in IT.

Source: Eurostat (online data code: demo_r_mlifexp)

The dispersion of life-expectancy within countries across regions is relatively low. In most countries it lies between 0 % and 4 %. In six countries however (Belgium, Spain, France, Poland, Portugal and the UK) some regions have life-expectancies that are 6 % higher than other regions in the same country. Interestingly, France, Spain and Portugal — having the highest life expectancies at the national level — belong to these high-dispersion-countries. However regions where life-expectancy is especially low in these countries are geographically remote regions like the Azores or Madeira in Portugal, the autonomic cities Ceuta and Melilla of Spain (situated in North Africa) and the French overseas territory Guiana.

Health inequalities in the EU

Over the last years the gap in male life expectancy at birth between Member States has narrowed by about 17 % — from 14.2 years in 2007 to 11.8 years in 2011. For the period 2006-2011 the female gap has also improved by about 4 % (from 8.2 to 7.9 years). The Gini coefficient for differences in life expectancy at birth also points to an overall reduction in health inequalities between Member States — it has reduced by 3.5 % for males and 10.4 % for females ([9]).

Health inequalities between groups of people are a result of social and economic differences that affect a wide range of health factors such as living and working conditions, health-related behaviour such as smoking, drinking and diet, and access to and quality of healthcare. In general, economic conditions, as measured by GDP, tend to be more strongly associated with health outcomes in less prosperous countries and regions. However, higher levels of GDP do not necessarily result in better health due to the importance of other factors such as income distribution, consumption, services and impact of public policies on health. Both at Member State and regional level social gradient in health exists across educational, income and occupational groups, where those at the lower levels tend to have lower life expectancy and higher incidence of health problems. For example, in 2010 the gap in life expectancy at 30 years of age between males with basic lower or secondary education and those with higher level education ranged from three to 17 years across the EU. For females the gap varied from one to nine years. Similarly, the level of poor health, long-term illness and restrictions on daily living activities are about twice as high (or higher) among the lowest educational and income groups compared to the highest income and education categories ([10]).

What lies beneath this indicators?

An improvement in healthy life years is considered as one of the main health goals for the EU: the European Innovation Partnership on Active and Healthy Ageing aims to increase the average healthy lifespan of Europeans by two years by 2020 ([11]). While life expectancy constitutes a conventional and solid indicator to reflect general health and health care conditions in different countries, the indicator of healthy life years is increasingly used to add the concept of quality of life to it. The indicator combines information on both the quality and length of life. Therefore, it reflects that the emphasis has shifted from seeing health simply in terms of longevity to also considering well-being in terms of the absence of morbidity.

Life expectancy is defined as the mean number of years still to be lived by a person at birth or a certain exact age, if subjected throughout the rest of his or her life to the current mortality conditions.

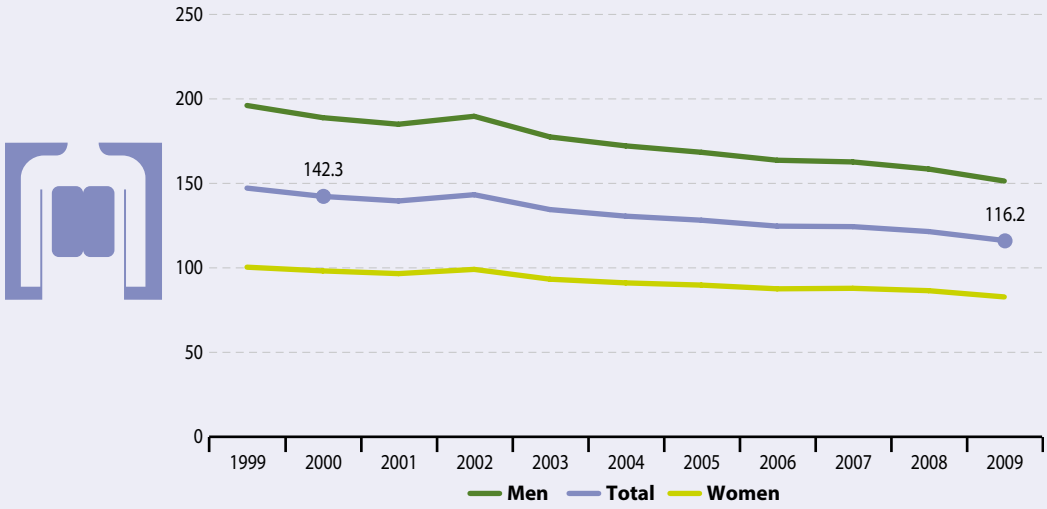
Healthy life years is defined as the number of years that a person is still expected to live in a healthy condition. It is compiled separately for males and females, at birth. The indicator combines information on mortality and morbidity. It is based on age-specific prevalence (proportions) of the population in healthy and unhealthy conditions and age-specific mortality information (age-specific probabilities of dying). A healthy condition is defined by the absence of limitations in functioning/disability.

([9]) The Gini coefficient is used as an indicator of inequality. Although it is mainly used to measure income inequality, it can also be applied to health. It can take values from 0 (perfect equality) to +1 (perfect inequality). For details on the method of calculation, see Regidor E, 'Measures of health inequalities: part 1', Journal of Epidemiology and Community Health 2004; 58: pp. 858–861; also see European Commission, *Report on Health Inequalities in the European Union*. Commission Staff Working Document, SWD(2013) 328 final, p. 3.
([10]) European Commission, *Report on Health Inequalities in the European Union*, SWD(2013) 328 final.
([11]) See http://ec.europa.eu/health/ageing/innovation/index_en.htm.

Deaths due to chronic diseases

18 % drop in the death rate due to chronic diseases in the EU between 2000 and 2009. However, chronic diseases remain the most frequent cause of death among people aged under 65

Figure 5.5: Death rate due to chronic diseases, by gender, population aged under 65, EU-27 (per 100 000 persons)



NB: 2000-2009 data are provisional.

Source: Eurostat (online data code: tsdph210)

Deaths due to chronic diseases occurring when people are less than 65 years old can be considered as premature. They are the most frequent causes of death among this age-group in high- and middle income countries. In fact, almost 60 % of all cases of deaths of the less than 65 year olds are due to chronic diseases.

Women are much less likely to die due to a chronic disease than men

The number of people dying due to a chronic disease at an age less than 65 decreased over time, namely by 2.2 % on average per year between 2000 and 2009. While in 2000 142 out of 100 000 people aged less than 65 died due to chronic diseases, the number was at 116 in 2009. Men are substantially more likely to die of a chronic disease than women.

In 2009 about 80 out of 100 000 women and about 150 out of 100 000 men aged less than 65 died of a chronic disease, which is almost twice as much. However the average decrease per year was considerably higher for men (2.4 %) than for women (1.9 %) suggesting a gender-convergence of the death rates.

The fall in deaths due to chronic diseases is partly a result of the declining overall death rate

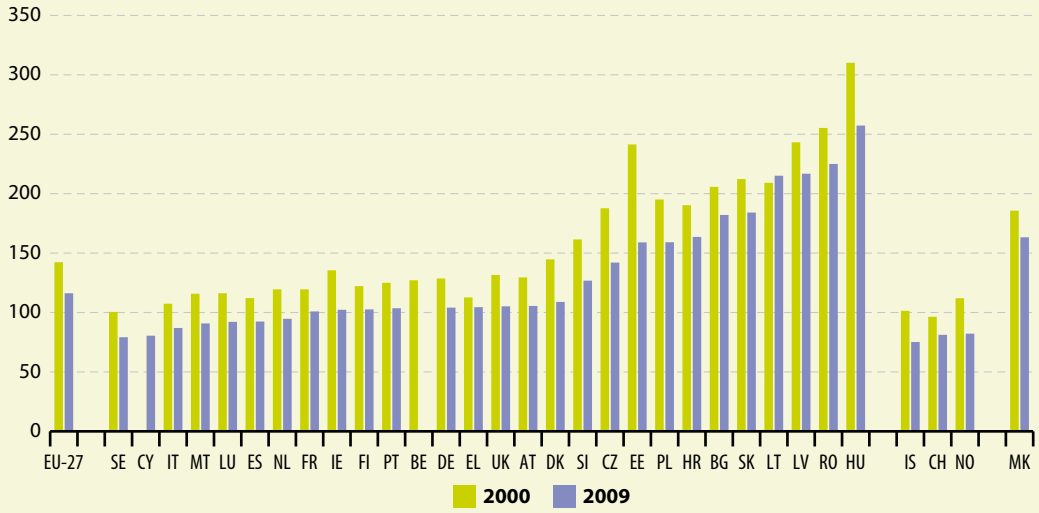
Explanations for the downward trend of the death rate due to chronic diseases are twofold. On the one hand reasons for the improvement could be the increased public awareness for healthier lifestyles, such as healthy eating, regular exercise, better managing stress and combating risk factors such as smoking and excessive alcohol consumption. These are assisted by national and EU level awareness initiatives as well as increasing efforts in implementing chronic disease management programmes in primary care. On the other hand the ratio of deaths due to chronic diseases in all deaths remained more or less stable over time, with only a marginal decrease of 0.2 % per year on average. This suggests that the decrease of the death rate due to chronic diseases is at least in part a result of the declining overall death rate.

How deaths due to chronic disease vary between Member States

Wide disparities of death rates due to chronic disease exist across the 27 EU Member countries. While in 2009 in Sweden about 80 people per 100 000 inhabitants died due to chronic diseases, the same number amounted to more than 250 in Hungary, which is more than three times as high. Overall, in nine countries the chronic disease death rates lie above the EU-27 average and still above 140 per 100 000 inhabitants. All of these nine countries are lower-income countries, but in five of these countries the ratios of chronic disease deaths on all deaths figure among the lowest in the whole EU (around 46 % to 52 % of all deaths in these countries are due to chronic diseases). This suggests that high chronic disease death rates are a result of the overall high death rates which in return are associated with lower development statuses in these countries.

In all countries except for Lithuania the chronic disease death rates decreased between 2000 and 2009. Countries that experienced especially high improvements were Estonia, Denmark, Ireland and the Czech Republic.

Figure 5.6: Death rate due to chronic diseases, population aged under 65, by country
(per 100 000 persons)



NB: 1999 data for BE (instead of 2000); 2007 data for CH, 2008 data for IT and FR (instead of 2009); data for EU-27 are provisional.

Source: Eurostat (online data code: tsdph210)

What lies beneath this indicator?

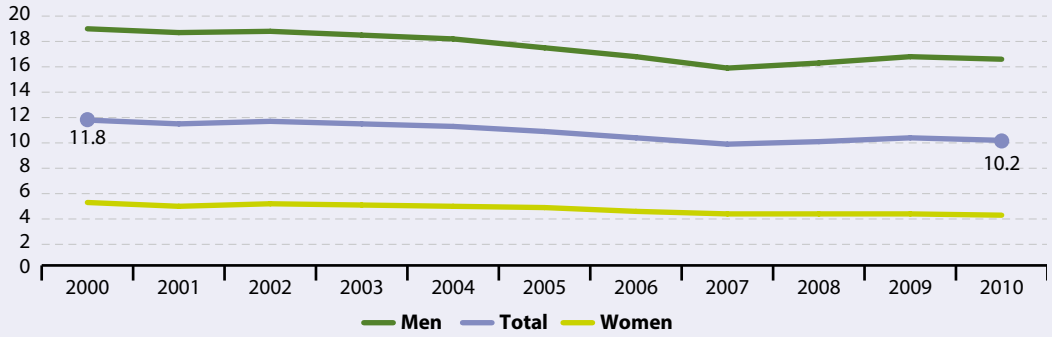
In many cases chronic diseases are caused or exacerbated by a number of risk factors: smoking, obesity, lack of physical activity, poor diet, and alcohol consumption. Particulate air pollution is also associated with premature mortality from cardiovascular disease and certain cancers. The high mortality of chronic diseases, combined with the fact that many cases of these diseases are preventable, has led to increasing efforts to reduce their incidence by preventing lifestyle-related risk factors.

The death rate due to chronic diseases is defined as the standardised death rate of certain chronic diseases for persons aged less than 65 years. This means it is calculated by dividing the number of people under 65 dying due to a chronic disease by the total population under 65. Chronic diseases that are included in the indicator are malignant neoplasms, diabetes mellitus, ischaemic heart diseases, cerebrovascular diseases, chronic lower respiratory diseases and chronic liver diseases.

Suicides

14 % drop in the suicide rate in the EU between 2000 and 2010. However, the decline has stopped since the onset of the economic crisis, in particular among men

Figure 5.7: Suicide death rate, by gender (standardised death rate), EU-27
(per 100 000 persons)



NB: Provisional data.

Source: Eurostat (online data code: hlth_cd_asdr)

Has the economic crisis taken its toll on suicide rates?

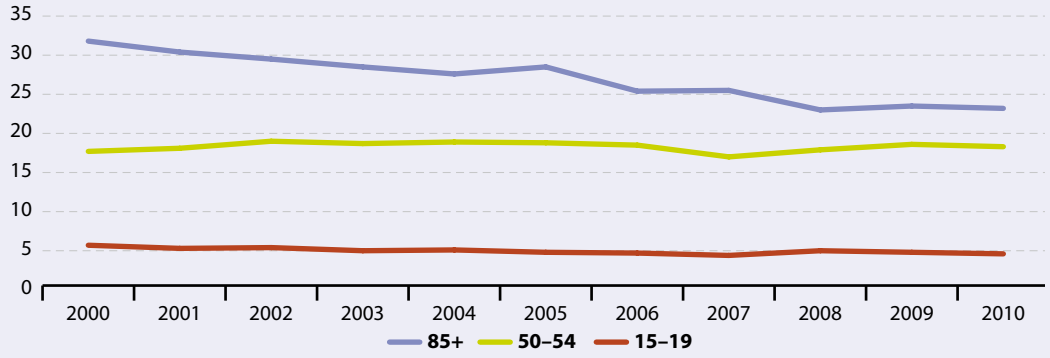
About 10 out of 100 000 people committed suicide in 2010 ([12]). Between 2000 and 2010 the suicide death rate recorded an overall average decrease of 1.4 %. However, most of this decrease took place in the period 2000 to 2007, when it fell by an annual average of 2.5 %. The suicide death rate started to increase after 2007, by 2 % in 2007 and 3 % in 2008 compared with the respective previous year. This trend coincides with the onset of the economic crisis and its negative impacts on unemployment starting in 2007 ([13]).

Women are less prone to suicide than men but the gap is closing

There are large gender differences. Suicide is nearly four times more common among men than among women. The gap between men and women is slowly closing. The closing of the gap especially took place between 2000 and 2007, a period of decline of the death rate among men. After 2007 however the suicide death rate among men started to increase again. Part of the explanation for the gender differences in suicide death rates may be due to men utilising more violent and lethal suicide methods ([14]). Sex differences also exist in fulfilled and attempted suicides. Women have a higher rate of attempted suicides than men, which is likely to be a result of differences in psychological responses to pain and anguish and emotional cope mechanisms. While an attempted suicide shows a belief that 'there is still hope that things might improve with involvement from others', male suicides seem to be grounded 'in the conviction that nobody can help and that there are no alternatives other than to die' ([15]). The high number of suicides among men has also been associated with undiagnosed depression, which might have very different symptoms than those normally prescribed among women. Not only do men commit suicide at higher rates than women at all ages, but also the number of male suicides increases significantly with age, unlike for women. A range of socioeconomic factors influences the suicide rate of men aged above 70, including men's retirement, being single, widowed or ill-health. Evidence suggests that the economic prosperity of a country is negatively related to suicide rate for men, but not for women. However, the roots of this phenomenon are still not very well researched ([16]).

([12]) Figures should be interpreted with care as suicide registration methods vary between countries and over time. Moreover, the figures do not include deaths from events of undetermined intent (part of which should be considered as suicides)
([13]) See Platt S, Hawton K, *Suicidal behaviour and the labour market. The International Handbook of Suicide and Attempted Suicide*, 2000 (pp. 309–383) for an analysis of the relationship between suicides and the labour market.
([14]) Tsuang et al., *Epidemiology of Suicide*. International Review of Psychiatry, Vol. 4 (1992): 117–29.
([15]) European Commission, *The State of Men's Health in Europe*, 2011 (pp. 320).
([16]) European Commission, *The State of Men's Health in Europe*, 2011 (p. 318).

Figure 5.8: Suicide death rate, by age group (crude death rate), EU-27
(per 100 000 persons)



NB: Provisional data.

Source: Eurostat (online data code: tsdph240)

Box 5.1: Suicides as an indicator of mental health

The rate of deaths due to suicide can generally be considered as an indicator of mental health. Mental disorders (such as depression, personality disorder, alcohol dependence, or schizophrenia) are considered as one of the key risk factors to suicide ([17]). Furthermore, the WHO defines mental health as one of the main constituents of human health: 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' ([18]). The WHO-five well-being index is an important tool for monitoring a person's state of mental well-being and detecting depression. It includes five short self-report statements regarding an individual mental state over the last two weeks ([19]).

Suicides more common in older age groups

The suicide death rates also vary with respect to age, with deaths due to suicide more common in older age groups. However the gap between the oldest and the youngest group is closing over time. In the year 2000 among people aged 85 and older almost 32 people per 100 000 committed suicide with a fatal outcome, while among the youngest age group (people aged 15 to 19) only about six out of 100 000 people died due to suicide. Until 2010 the suicide death rate among people aged 85 and over substantially reduced down to about 23 people per 100 000. One possible explanation for the observed age gap is a higher probability of survival for young people attempting to commit suicide. Also the decline of the suicide death rate among old people could be explained by an increasing probability of survival over time ([20]).

What lies beneath this indicator?

Suicide is the major cause of death after chronic diseases and transport accidents. Suicide death rate is an indicator of mental health as suicides are an (rare and extreme) outcome of mental illness. Especially for young people suicides are leading to life years lost which generates a potential lost to society.

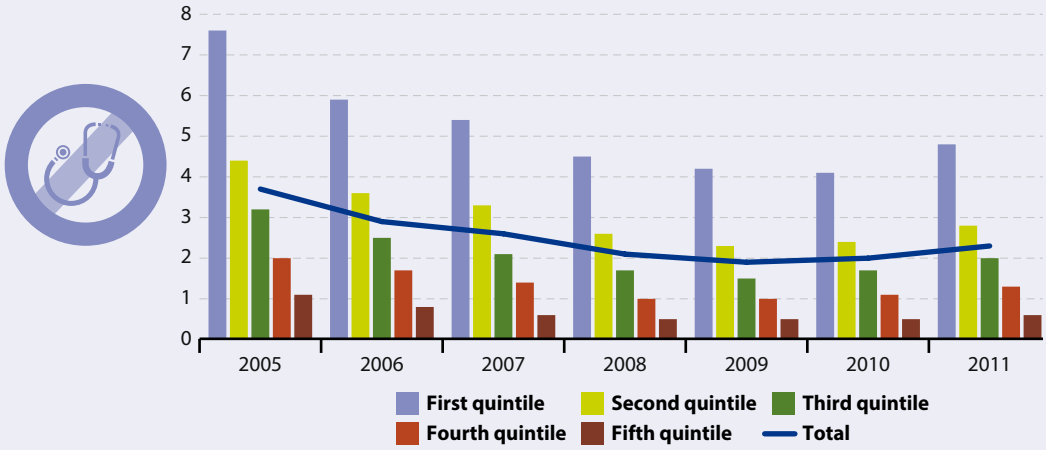
The suicide death rate is defined as the crude death rate from suicide and intentional self-harm. The crude death rate describes mortality in relation to the total population. Expressed in deaths per 100 000 inhabitants, it is calculated as the number of deaths recorded in the population for a given period divided by the population in the same period and then multiplied by 100 000.

([17]) See http://www.who.int/topics/suicide/en/.
([18]) See definition at http://www.who.int/features/factfiles/mental_health/en/.
([19]) For more information see Psychiatric Research Unit, WHO Collaborating Center for Mental Health, Frederiksborg General Hospital, *WHO (Five) Well-Being Index* (1998 version).
([20]) Antonio Preti, *Trends in suicide case fatality in Italy*, 1983–2007, Psychiatry Research 196 (2012): 255–260.

Unmet needs for medical health care

1.4 percentage point drop in the share of people perceiving unmet needs for medical health care in the EU between 2005 and 2011. However, since the onset of the economic crisis more people have felt unable to afford medical expenses. Differences between income groups persist

Figure 5.9: Self-reported unmet need for medical examination or treatment, by income quintile, EU-27
(%)



NB: Data for 2005 and 2006 are estimates.

Source: Eurostat (online data code: tsdph270)

Income quintiles *divide the population into five income groups from lowest income to highest income such that 20 % of the population is in each group. The first income quintile consists of 20 % of the population with the lowest incomes; the fifth quintile of 20 % of the population with the highest income.*

In 2011, 2.3 % of the EU population reported that they were not able to afford medical treatment or examination in the last 12 months ([21]). Between 2005 and 2009 this share had fallen continuously, by 1.8 percentage points. After 2009, however, the trend experienced a turnaround, growing slightly by 0.4 percentage points until 2011. This coincides with the impacts of the economic crisis, showing that increasing economic constraints can lead to less access to medical care.

The more people are economically constrained, the more often they report unmet medical needs

This observation becomes also apparent by means of the differences in perceived access to health care across people from different income quintiles. Only few people from the highest income quintile report unmet needs for medical care; in 2011 this share stood at 0.6 %. With falling income levels, the proportion of those who consider expense as an obstacle to access medical care increases. Among those from the lowest income quintile almost 5 % of the people reported unmet medical needs in 2011.

In the period before the crisis, the proportion of people reporting unmet needs for healthcare did not only fall overall, but for all income groups. This trend was reversed in 2010 when only the lowest income group reported an improvement of some 2 %. Comparing the pre-crisis levels reported in 2008 with 2011, evidence suggests that the crisis has been relatively harsher for the higher and middle income groups. For the three upper quintiles, rates increased between 18 % and 30 % in this period while for the two lowest income groups the relative increase was about 7–8 %. Yet, throughout the period the number of people in the lowest income group was significantly higher than the number in each of the other groups.

([21]) The comparability of the indicator between countries is limited as national questions on self-reported unmet need for medical care are not completely harmonised, differences in national health systems limit the comparability and indicators based on self-reporting incorporate individual subjective cultural effects and perceptions. The indicator should be interpreted carefully.

Are health inequalities within the EU improving?

At the same time the gap between the lowest and the highest income groups decreased, at least in absolute terms. While the gap accounted for 6.5 percentage points in 2005, it was only 3.7 percentage points in 2009 and 3.6 percentage points in 2010. However in relative terms the relation between the richest and the poorest did not improve substantially in the examined period. In 2005 and 2006 the share of people perceiving unmet medical needs among the lowest income group was seven times higher than in the highest income group. In 2008 people reporting unmet needs for healthcare from the lowest income group were 9 times more than those with highest income and in 2011 the proportion was 8 to 1.

Box 5.2: Focus on the reduction of health inequalities within the EU policies

Reducing health inequalities within and between Member States is one of the objectives of the EU Sustainable Development Strategy. The EU envisions achieving this goal by addressing wider determinants of health such as environmental pollution, food and feed quality, animal health and welfare, quality of life, and strengthening and developing health promotion and disease prevention strategies. In designing health related programmes and actions special attention is given to vulnerable groups, especially children ([22]). The European Commission has recently laid down the framework for tackling health inequalities by focusing on reductions of economic and social disparities ([23]). Some of the action plans for addressing health inequalities set out by the Commission include:

- Collaboration with national authorities, regions and other stakeholders.
- Assessment of the impact of EU policies on health inequalities to ensure that they help reduce them where possible.
- Regular statistics and reporting on the size of inequalities in the EU and on successful strategies to reduce them.
- Better information on EU funding to help national authorities and other bodies address the inequalities.

What lies beneath this indicator?

The indicator shows inequalities in access to health care between income quintiles. It is defined as the share of the population reporting that at least once in the previous 12 months they could not afford medical examination or treatment. Income quintiles represent the income of respondents relative to the national population. Income quintiles are recognised as the main indicator of socioeconomic disparities.

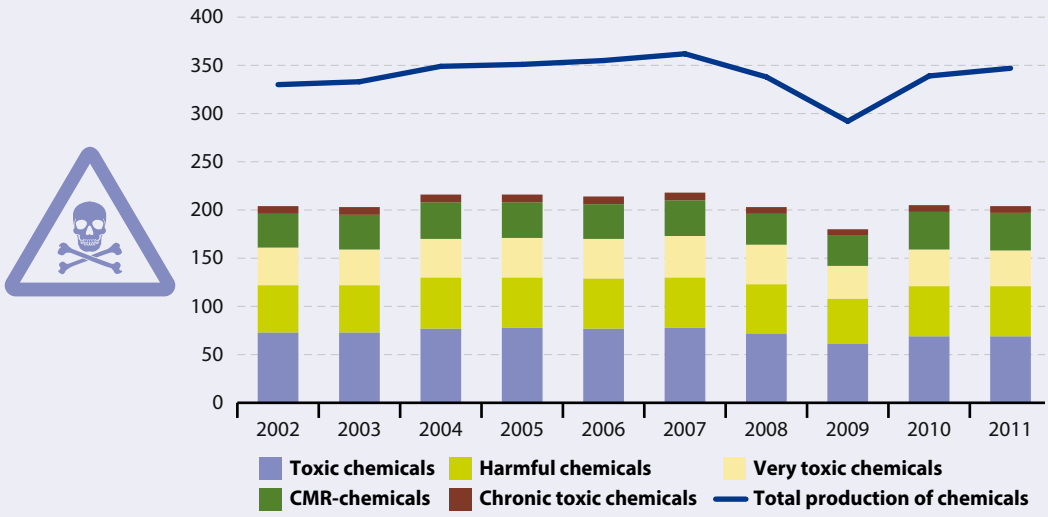
Unequal access to health care leads to inequalities in health which has negative consequences for social cohesion and economic development.

([22]) Council of the European Union, *2009 Review of the EU Sustainable Development Strategy — Presidency report*, 16818/09.
([23]) Commission Communication, *Solidarity in health: Reducing health inequalities in the EU*. COM(2009) 567 and progress report. SWD(2013)328.

Production of toxic chemicals

204 million tonnes of toxic chemicals produced in the EU in 2011. Production reached a low in 2009 but climbed back to pre-crisis levels until 2011

Figure 5.10: Production of toxic chemicals, by toxicity class, EU-27
(million tonnes)



Source: Eurostat (online data code: tsdph320)

In 2011 around 350 million tonnes of chemicals were produced in the EU. This is some 50 million tonnes more than two years before and represents an increase of the production volume of almost 20 % within two years.

The overall share of produced industrial chemicals that are toxic to human health followed a modest downward path over the last ten years. From a peak of 62 % of total chemicals production in 2002, the share of toxic chemicals fell (despite a temporary rise in 2009) to 61 % in 2010 and to 59 % in 2011. The shares of the different types of toxic chemicals shown in Figure 5.10 remained rather stable throughout the whole time period.

Share of toxic chemicals produced fell however their production level has remained largely unchanged in absolute terms

The overall reduction in this share may be attributed to output levels for toxic chemicals remaining largely unchanged between 2002 and 2011 (– 0.5 %), while there was an expansion in the production of non-toxic chemicals (13.9 %). This also underlies the fall in the share of toxic chemicals in 2011. The time series from 2002 to 2011 therefore provides little indication that the production of chemicals toxic to human health and/or harmful to ecosystems has been significantly decoupled from overall chemicals production. Thus the regulation for the registration, evaluation, authorisation and restriction of chemicals (REACH) ([24]) which entered into force in June 2007, does not seem to have contributed to a reduction of the total volume of toxic chemical production ([25]).

([24]) Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency.
([25]) ECHA, Implementing REACH in practice; see http://www.eubusiness.com/topics/chemicals/echa-reach-guide/.

Box 5.3: EU objectives focusing on chemicals including pesticides

Toxic chemicals pose threats to human health and the environment. Therefore, the EU Sustainable Development Strategy includes the objective that by 2020 chemicals, including pesticides, are produced, handled and used in ways that do not pose significant threats to human health and the environment. In this context, the recent adoption of the REACH regulation represents an important milestone. Proposals for a regulation on the placing of plant protection products on the market and for a framework directive on the sustainable use of pesticides were adopted by the Commission in 2006 and came into force in 2009 ([26]). The regulation and the framework directive aim at leading to significant reductions in the risks from pesticide production and use.

What lies beneath this indicator?

The indicator represents the trend in aggregated production volumes of toxic chemicals than can be broken down into five toxicity classes. These classes, starting with the least dangerous, are: harmful chemicals, toxic chemicals, very toxic chemicals, chronic toxic chemicals and CMR chemicals (carcinogenic, mutagenic and reprotoxic).

Box 5.4: European Commission plans to better protect bees from pesticides

The European Commission has adopted a proposal for a regulation ([27]) to restrict the use of three pesticides belonging to the neonicotinoids family (clothianidin, imidacloprid and thiametoxam) for a period of two years. The proposal is a response to the European Food Safety Authority's (EFSA) scientific report ([28]) which identified 'high acute risks' for bees as regards exposure to dust in several crops such as maize, cereals and sunflower, to residue in pollen and nectar in crops like oilseed rape and sunflower and to guttation in maize.

The proposal restricts the use of three neonicotinoids (clothianidin, imidacloprid and thiametoxam) for seed treatment, soil application (granules) and foliar treatment on bee attractive plants and cereals. In addition, the remaining authorised uses are available only to professionals. Exceptions will be limited to the possibility to treat bee-attractive crops in greenhouses, in open-air fields only after flowering. The restrictions will apply from 1 December 2013. As soon as new information is available, and at the latest within two years, the Commission will review the conditions of approval of the three neonicotinoids to take into account relevant scientific and technical developments.

([26]) Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC; Framework Directive on the Sustainable Use of Pesticides: Directive 2009/128/EC, 21 October 2009

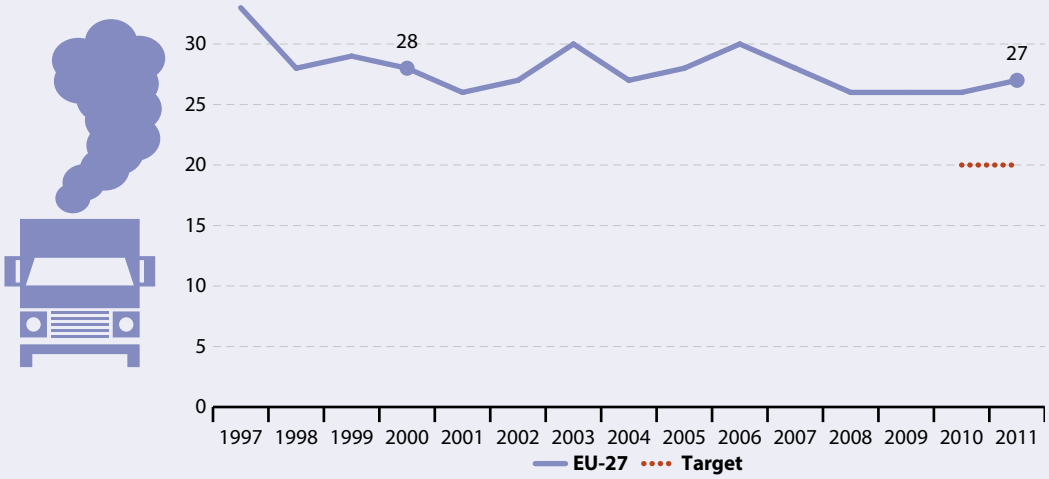
([27]) Regulation (EU) No 485/2013 of 24 May 2013 amending Implementing Regulation (EU) No 540/2011, as regards the conditions of approval of the active substances clothianidin, thiamethoxam and imidacloprid, and prohibiting the use and sale of seeds treated with plant protection products containing those active substances.

([28]) See http://www.efsa.europa.eu/en/press/news/130116.htm.

Exposure to air pollution by particulate matter

One microgram per cubic metre reduction in exposure to air pollution by particulate matter in the EU between 2000 and 2011. The 2010 target has not been met

Figure 5.11: Urban population exposure to air pollution by particulate matter, EU-27
(micrograms per cubic metre)



Source: European Environment Agency, Eurostat (online data code: tsdph370)

Particulate matter *describes tiny pieces of solid or liquid matter in the atmosphere. The main sources in urban areas are diesel-engined road vehicles, industrial, public, commercial and residential combustion. Fine particulate matter (PM_{10}) — less than 10 micrometers in diameter— can be carried deep into the lungs where it can cause inflammation and a worsening of the condition of people with heart and lung diseases.*

Between 2000 and 2011 air pollution by particulate matter decreased by 1 microgram per cubic metre. However, given the substantial year-on-year variations it is difficult to discern any clear trend. The so-called first Daughter Directive ([29]), adopted in 1999, had set annual limit targets for 2005 and 2010 regarding the annual mean concentrations of particulate matter in micrograms per cubic metre. While the 2005 target of 40 micrograms per cubic metre was easily met, the 2010 target of 20 micrograms could not be achieved. In 2010 the emission of particulate matter constituted 26 micrograms per cubic metre, which is 6 micrograms above the target. The increase in 2011 has moved the EU even further away from this target.

The peaks in 2003 and 2006 were partially due to severe heat waves during those summers. The hot, dry conditions led to stagnant air in which pollutants accumulated. In 2003, at least, conditions were exacerbated by the prevalence of wildfires in south-western Europe producing large quantities of particulates which were then transported to the northern and eastern parts of Europe ([30]). Furthermore the 'El Nino' phenomenon might have had an impact on particulate matter concentration and contributed to the peaks in 2003 and 2006.

In addition to sporadic wildfires, the Member States bordering the Mediterranean also suffer from dust blown from North Africa.

([29]) Directive 2008/50/EC on ambient air quality and cleaner air for Europe.
([30]) Hodzic A., Madronich, S., Bohn, B., Masiie, S., Menut, L., and Wiedinmyer, C., *Wildfire particulate matter in Europe during summer 2003: meso-scale modeling of smoke emissions, transport and radiative effects*, Atmospheric Chemistry and Physics, 2007, Vol. 7, pp. 4 705–4 760.

Box 5.5: Objectives on the reduction of particulate matter in the first Daughter Directive and the Thematic Strategy on Air Pollution

In 1996 the Environment Council adopted the Framework Directive on ambient air quality assessment and management ([31]). The first Daughter Directive ([32]) relating to limit values for PM10 and other pollutants in ambient air fixed an annual limit value of 40 micrograms of PM_{10} per cubic meter. More recently, the Directive 2008/50/EC ([33]) set a framework to define and establish objectives for ambient air quality and to harmonise methods and criteria among the Member States.

The Thematic Strategy on Air Pollution ([34]) includes a long-term objective for 2020 that is a 47 % reduction in loss of life expectancy as a result of exposure to particulate matter entailing emission reduction of primary $PM_{2.5}$ by 59 % compared to the year 2000.

What lies beneath this indicator?

According to the recommendations of the World Health Organisation the annual mean concentration is the best indicator for PM-related health effects.

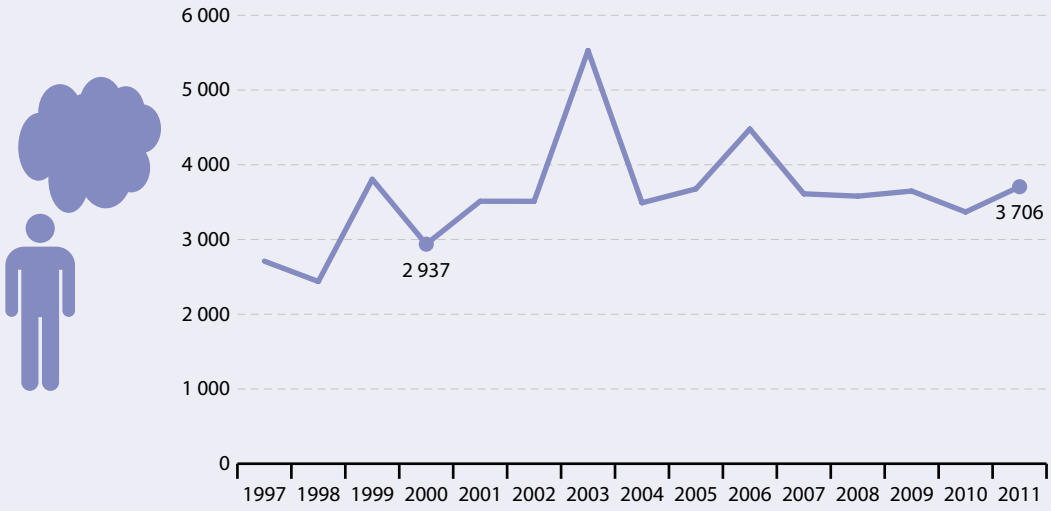
The indicator shows the population-weighted concentration of PM_{10} to which the urban population is potentially exposed.

([31]) Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management.
([32]) Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air.
([33]) Council Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe.
([34]) European Commission, Thematic Strategy on air pollution, COM(2005) 446 final.

Exposure to air pollution by ozone

About 770 micrograms per cubic metre day increase in exposure to air pollution by ozone in the EU between 2000 and 2011. Changing weather patterns contribute to yearly and regional differences in ozone concentrations

Figure 5.12: Urban population exposure to air pollution by ozone, EU-27
(micrograms per cubic metre day)



Source: European Environment Agency, Eurostat (online data code: tsdph380)

***Ozone** is not emitted directly into the air, but is formed by gases called nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that in the presence of heat and sunlight react to form ozone. Ground-level ozone forms readily in the atmosphere, usually during hot weather. NO_x is emitted from motor vehicles, power plants and other sources of combustion. VOCs are emitted from a variety of sources, including motor vehicles, chemical plants, refineries, factories, consumer and commercial products and other industrial sources.*

Overall exposure to air pollution by ozone rose at an annual average rate of 1.7 % between 2000 and 2011. However the development was very volatile. The high exposure in the year 2003 is related to the heat wave in that summer ([35]). A smaller peak also occurred in 2006 for similar reasons.

Urban exposure to ozone widely varied between countries, partly due to differences in climate and vegetation. In general, southern countries with higher summer temperatures show higher exposure levels than the cooler northern countries. Nevertheless, peaks occurred throughout the EU in 2003 and 2006 due to exceptionally high temperatures in those years. This increase was most pronounced in the northern countries, which showed higher relative increases compared to the southern countries.

What lies beneath this indicator?

Ozone causes serious health problems and damage to the ecosystem, agricultural crops and materials. When inhaled even at very low levels, ozone can cause acute respiratory problems, asthma, inflammation of lung tissue; impair the body's immune system defences, making people more susceptible to respiratory illnesses, including bronchitis and pneumonia.

The indicator shows the concentration of ozone to which the urban population is potentially exposed. It is population-weighted meaning that it represents the average annual exposure level of the average resident to ozone.

([35]) Johnson H., Kovats S., McGregor, G., Stedman, J., Gibbs, M., and Walton, H., *The impact of the 2003 heatwave on daily mortality in England and Wales and the use of rapid weekly mortality estimates*, Euro Surveillance, 2005, Vol. 10, pp. 168-171.

Box 5.6: Objectives on the reduction of ozone in the first Daughter Directive and the Thematic Strategy on Air Pollution

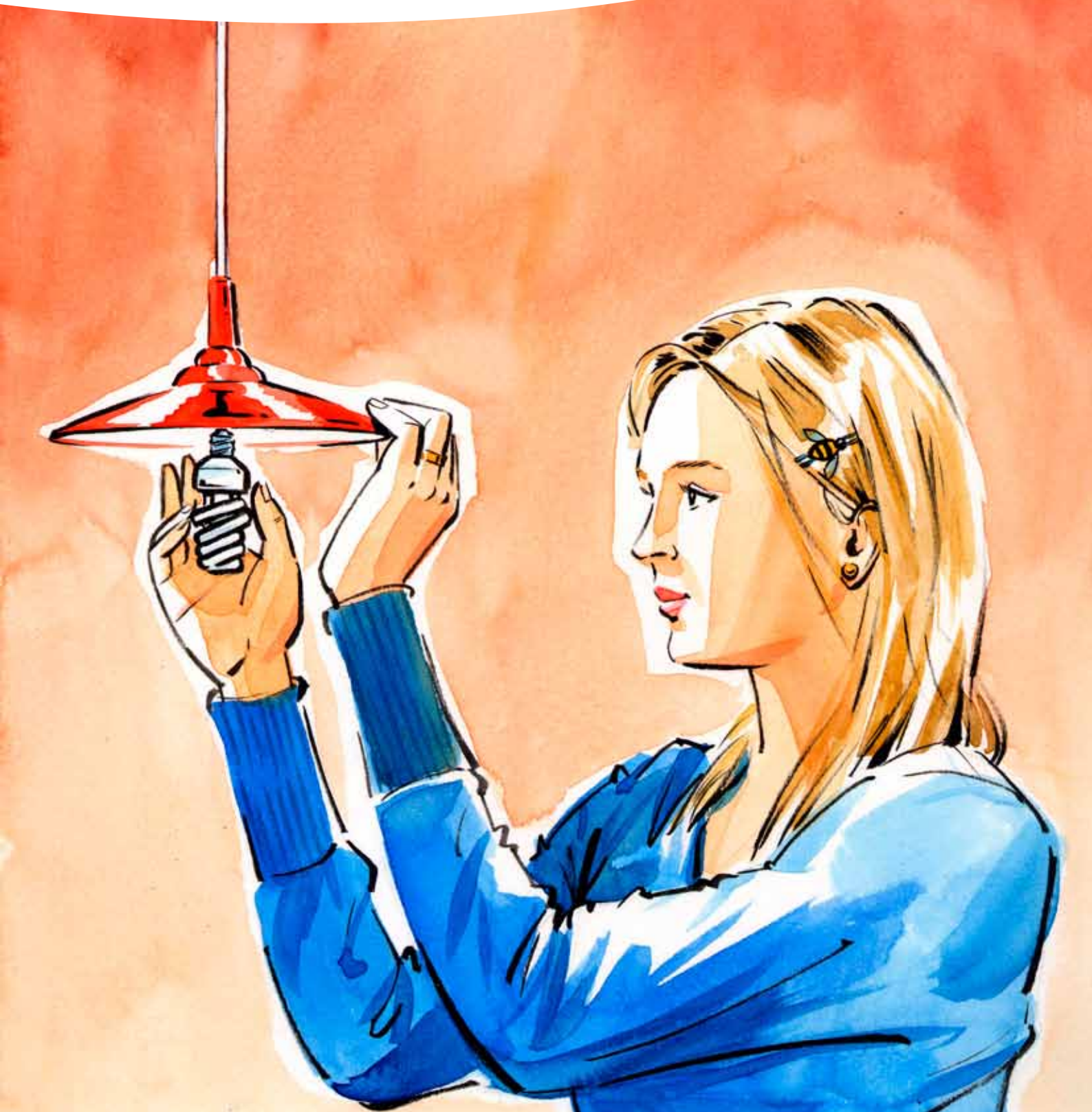
In 1996, the Environment Council adopted the Framework Directive ([36]) on ambient air quality assessment and management. The third Daughter Directive ([37]) relating to ozone was adopted on 12 February 2002 with a long-term objective of 120 micrograms of ozone per cubic meter as a maximum daily eight-hour mean within a calendar year. More recently, the Directive 2008/50/EC ([38]) set a framework to define and establish objectives for ambient air quality and to harmonise methods and criteria among the Member States.

The Thematic Strategy on Air Pollution ([39]) includes a long-term ozone reduction objective for 2020, namely a 10 % reduction in acute mortalities from exposure to ozone. This entails the following emissions reductions: nitrogen oxides by 60 %, volatile organic compounds by 51 % compared to the year 2000.

([36]) Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management.
([37]) Council Directive 2002/3/EC of 12 February 2002 relating to ozone in ambient air.
([38]) Council Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe.
([39]) European Commission, *Thematic Strategy on air pollution*, COM(2005) 446 final.

6

Climate change and energy



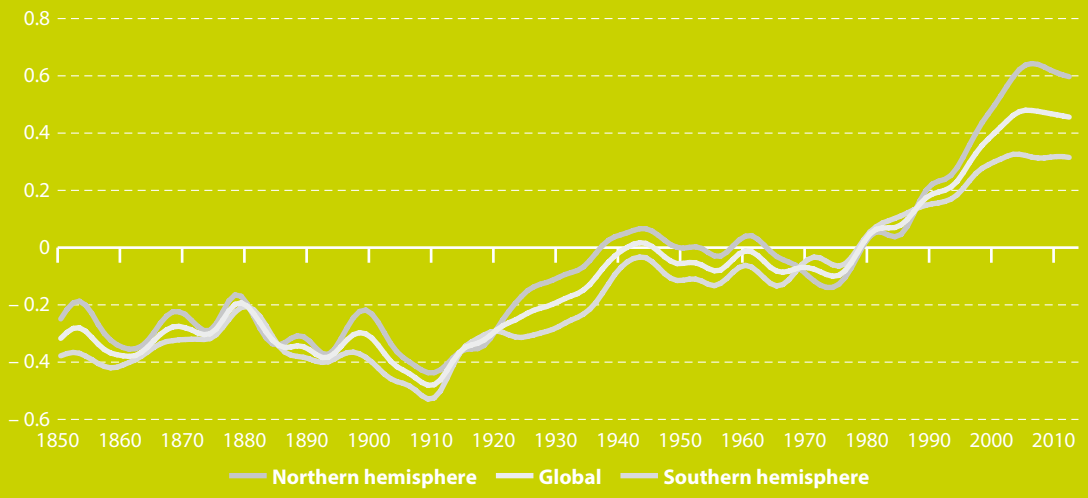
Climate change and energy seen through the lens of Green Economy

Our planet is warming — and Europe even more

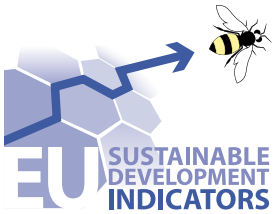
Recordings of the combined global land and marine surface temperature show a clear upward trend. 2012 was the ninth warmest year on record, and all years between 2001 and 2012 were among the top 13 warmest. Warming is stronger over land and thus temperatures have risen more in the northern hemisphere than in the southern part of the world.

For Europe, the average temperature in the last decade (2003-2012) was 1.3°C above the pre-industrial level, making it the warmest on record. As a result of this warming, extremes of cold have become less frequent, while the frequency of warm extremes has increased. According to simulations, temperatures in Europe will continue to increase by more than global average during the 21st century.

Global annual mean temperature deviations
(temperature deviation in °C, compared to 1961–1990 average)



Source: UK Met Office Hadley Centre



Overview of main changes

At first glance, the EU has made substantial progress towards achieving its energy and climate objectives. Greenhouse gas (GHG) emissions and primary energy demand are approaching the 2020 targets. However, an analysis of the driving forces behind these positive trends leads to a more cautious assessment. The lowered industrial production, transport volumes and energy demand during the economic crisis and its aftermath caused a strong drop in energy consumption and GHG emissions between 2007 and 2011 (with the exception of an increase in emissions from 2009 to 2010). A mild winter in 2010/2011 further pushed down energy demand. The most recent reductions are thus at least in parts linked to low economic performance, rather than reflecting a thorough transformation of the EU energy sector. By contrast, the fast expansion of renewable energies is a clearly favourable trend, particularly in the electricity sector.

Table 6.1: Evaluation of changes in the climate change and energy theme (EU-27, from 2000) (1)

Level 1	Level 2	Level 3
	Climate change	
Greenhouse gas emissions		
Consumption of renewables (*)	**Energy**	
Energy efficiency	Energy dependence	Electricity generated from renewables

(*) From 2004

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.

Why do we deal with climate change and energy?

Climate change is a threat to sustainable development. Higher temperatures, rising sea levels and more frequent weather extremes are already observed in the EU and globally. After years of extensive research, the scientific community agrees that man-made greenhouse gas (GHG) emissions are the dominant cause of increases in the average temperature of the Earth over the last 250 years ([2]). The recent Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) projects that, depending on future levels of GHG emissions, global mean surface temperature could increase by 0.3 °C to 4.8 °C by the end of the 21st century relative to 1986–2005 ([3]). Rapid climate change puts many coastal communities, food security, human health and ecosystems at risk. To avoid such negative consequences, the international community has committed itself to limit mean global temperature rise to 2 °C above pre-industrial levels ([4]).

Man-made GHG emissions are a by-product of burning of fossil fuels in power plants, cars or homes. Farming, forest clearing and waste are also sources of GHG emissions, but in the EU energy consumption is by far the largest emitter. Therefore, measures to transform the sector are at the heart of climate change mitigation efforts.

Two main measures for building a sustainable energy sector are replacing fossil fuels by renewable energy sources and reducing energy consumption ([5]). These measures can also help reduce the EU's dependence on energy imports which exposes the EU to increasingly volatile world market prices for fossil fuels.

The push towards a climate-friendly economy holds many opportunities for Europe: the demand for better green technologies can spur innovation and create jobs. By mastering new technologies such as smart grids, energy storage or electric vehicles, the EU can strengthen its exports in a growing global market. At the same time, more efficient energy use also lowers production costs, thereby increasing competiveness of EU businesses.

The climate change and energy theme is linked to other areas of sustainable development in many ways. Since energy is used in virtually every economic activity, climate change and energy policies have an impact on a wide range of economic activities. A more sustainable energy sector can thus have synergies with actions covered in the areas of sustainable consumption and production and transport. For example, lower transport volumes, a modal shift to trains and public transport or lower material consumption help reduce energy consumption and thus GHG emissions. Climate change also plays a key role in development assistance since it is already affecting many developing countries.

([2]) Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013, *The Physical Science Basis Summary for Policymakers, Intergovernmental Panel on Climate Change*, 2013, p. SPM-12.
([3]) Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013, *The Physical Science Basis Summary for Policymakers, Intergovernmental Panel on Climate Change*, 2013, p. SPM-15.
([4]) United Nations Framework Convention on Climate Change, *Copenhagen Accord*, Copenhagen: United Nations, 2009.
([5]) Commission communication, *A roadmap for moving to a competitive low carbon economy in 2050*, COM(2011) 112.

How does the EU tackle climate change and energy?

The EU Sustainable Development Strategy (EU SDS) ([6]) dedicates one of its seven key challenges to climate change and energy. This has the overall objective to "limit climate change and its costs and negative effects to society and the environment". The operational objectives in the EU SDS relating to climate change and energy are:

- Kyoto Protocol commitments for the EU-15 of reducing GHG emissions by 2008–12 by 8 % compared to 1990 levels. Aiming for global surface average temperature not to rise more than 2 °C compared with the pre-industrial level.
- Energy policy should be consistent with the objectives of security of supply, competitiveness and environmental sustainability. Energy policy is crucial when tackling the challenges of climate change.
- Adaptation to, and mitigation of, climate change should be integrated into all relevant EU policies.

The Europe 2020 strategy ([7]) sets three headline targets for climate and energy policy, to be reached by 2020:

- Reducing GHG emissions by 20 % compared to 1990 levels.
- Increasing the share of renewables in final energy consumption to 20 %.
- Moving towards a 20 % increase in energy efficiency.

Additionally, the Europe 2020 strategy points out that the EU is committed to move to a 30 % reduction by 2020 compared to 1990 levels. The condition is that other developed countries commit themselves to comparable emission reductions and that developing countries contribute adequately according to their responsibilities and respective capabilities.

Further reading on climate change and energy

Commission Communication, *A roadmap for moving to a competitive low carbon economy in 2050*, COM(2011) 112.

Ecofys et al., *Renewable energy progress and biofuels sustainability*, London, 2012.

European Commission, *A resource-efficient Europe — flagship initiative under the Europe 2020 Strategy*, Luxembourg, 2011.

European Commission, An EU Strategy on adaptation to climate change, COM(2013) 216.

European Commission, Council, the European Economic and Social Committee and the Committee of The Regions: *Renewable energy progress report*. European Commission, Brussels, 2013.

European Commission, *Europe 2020 targets: climate change and energy*, Brussels, 29 May 2013.

European Commission, Green paper on the insurance of natural and man-made disasters COM(2013) 213.

European Environment Agency, *Annual European Union greenhouse gas inventory 1990–2011 and inventory report 2013*, Publications Office of the European Union, Luxembourg, 2013.

European Environment Agency, *Trends and projections in Europe 2013. Tracking progress towards Europe's climate and energy targets until 2020*, EEA Report No 10/2013, Copenhagen, 2013.

Eurostat, 2011, *Driving forces behind EU-27 greenhouse gas emissions over the decade 1999–2008*, Statistics in Focus 10/2011, Luxembourg.

Eurostat, 2012, *Renewable Energy: Analysis of the latest data from renewable sources*, 44/2012.

Eurostat, *Energy, transport and environment indicators*, 2012 edition, Publications Office of the European Union, Luxembourg, 2013.

International Energy Agency, *World Energy Outlook 2013*, Paris, IEA, 2013.

IPCC, Summary for Policymakers, in: Field, C. B. et al. (eds.), *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working groups I and II of the Intergovernmental Panel on Climate Change*, Cambridge, 2012, p. 3–21.

IPCC Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: *The Physical Science Basis Summary for Policymakers*, Intergovernmental Panel on Climate Change, 2013.

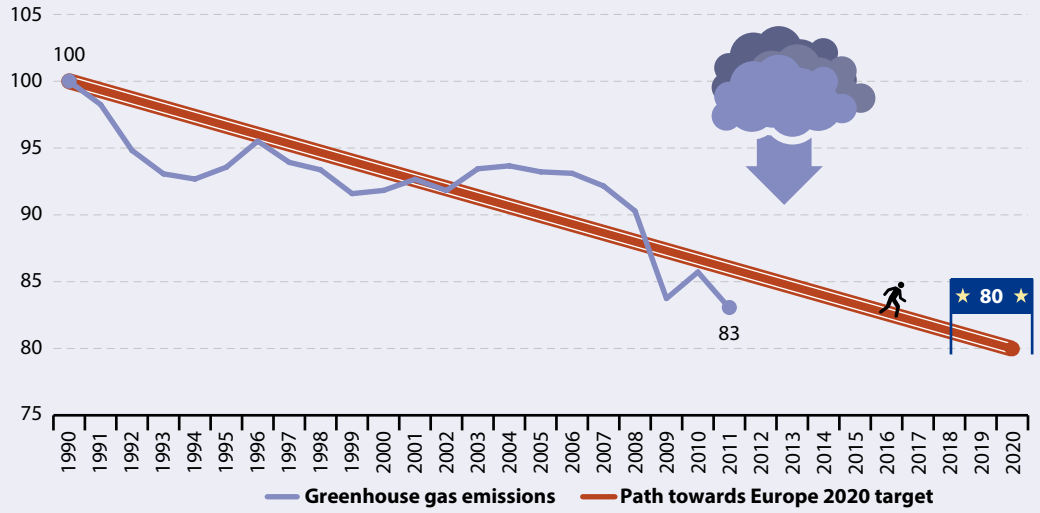
World Meteorological Organization, *The global climate 2001–2010. A decade of climate extremes*, WMO-No. 1119, Geneva, 2013.

([6]) Council of the European Union, *Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy*, 10917/06, Brussels, 2006.
([7]) European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010 (p. 11).

Greenhouse gas emissions

17 % less greenhouse gases (GHGs) have been emitted in 2011 compared to 1990 in the EU. At the current rate of reduction, the EU will overachieve its 2020 target to reduce GHG emissions by 20 %

Figure 6.1: Greenhouse gas emissions, EU-27
(index 1990 = 100)



NB: Total emissions, including international aviation, but excluding emissions from land use, land use change, and forestry (LULUCF). The EEA reports a reduction of 18.4 % in 2011 compared to 1990 level because it focuses on domestic emissions only and thus does not include emissions from international aviation.

Source: European Environment Agency, Eurostat (online data code: tsdcc100)

*The **'Kyoto basket'** encompasses the following six greenhouse gases: carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O), and the so-called F-gases (hydrofluorocarbons and perfluorocarbons) and sulphur hexafluoride (SF_6). Each gas is weighted by its global warming potential and aggregated to give total greenhouse gas emissions in CO_2 equivalents.*

In 2011, greenhouse gas emissions of the EU-27, accounting for the total emissions of the six man-made gases of the 'Kyoto basket', were down by 17 % compared to 1990. In absolute terms, the EU cut its emissions by 958 million tonnes of CO_2 equivalent between 1990 and 2011. This figure includes international aviation. Without it, the reduction is 18.4 %, as reported by the European Environment Agency (EEA) ([8])([9]).

Despite this positive trend, the average annual emission reductions between 2000 and 2011 are not sufficient to put the EU on a pathway to meeting its long-term commitment ([10]) to reduce greenhouse gas emissions by 80-95 % by 2050 compared with 1990 levels.

A large portion of the achieved emission reduction occurred during the early 1990s as a result of economic restructuring in Eastern Europe. In this period, the region experienced a shift from heavy manufacturing industries to more service-based economies. The relatively low emissions reductions achieved between 2000 and 2008 were partly driven by a fuel switch in power generation from coal to natural gas and, to a minor extent, renewable energies. Significant reductions were also made in the waste sector through waste treatment processes with a lower carbon footprint. In the agricultural sector, declining numbers of livestock and less nitrogenous fertilisers helped to cut emissions ([11]).

([8]) EEA, *Annual greenhouse gas inventory 1990–2011 and inventory report 2013*, EEA Report No. 8/2013. Copenhagen 2013 (p. 6).
([9]) According to the latest EEA progress report, GHG emissions in the EU-28 fell by an additional 1 % between 2011 and 2012, to – 18 % (including international aviation). Based on these provisional data, EU-28 emissions were thus close to the Europe 2020 target of reducing GHG emissions by 20 % by 2020, eight years ahead of schedule. The EEA projects that are based on existing policy measures GHG emissions of the EU-28 will go down to 21 % by 2020. With additional policies and measures currently planned by Member States, emissions reduction could even reach 24 % in 2020 (see European Environment Agency, Trends and projections in Europe 2013. *Tracking progress towards Europe's climate and energy targets until 2020*, EEA Report No 10/2013, Copenhagen, 2013 (p. 94)).
([10]) Council of the European Union. Council Conclusions on EU Position for the Copenhagen Climate Conference (7–18 December 2009), Brussels, European Union, 2009 (p. 2).
([11]) Eurostat, *Driving forces behind EU-27 greenhouse gas emissions over the decade 1999–2008*, Statistics in Focus 10/2011, 2011 (p. 2).

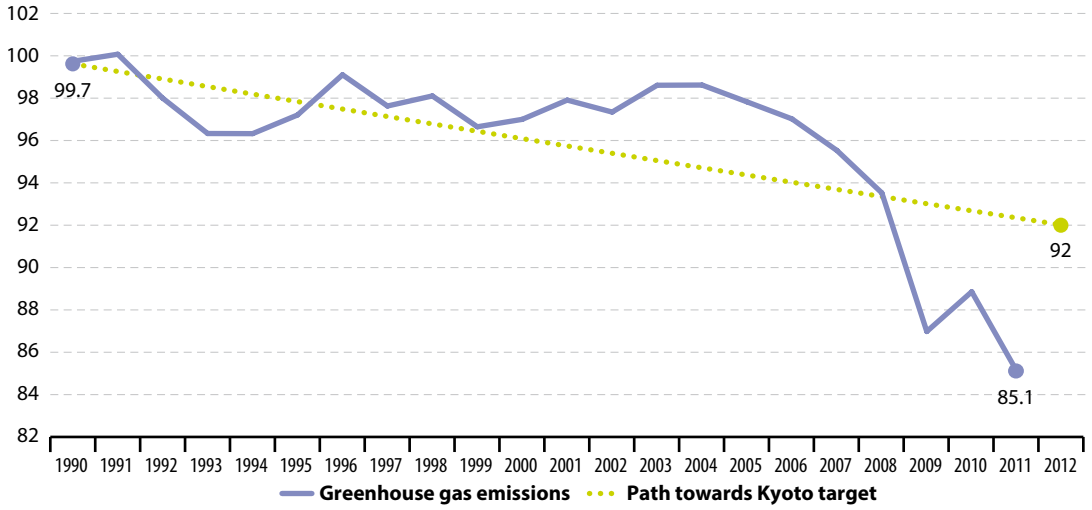
Sharp drop in emissions between 2008 and 2011 can be linked to the economic crisis and mild winter weather

Between 2008 and 2011, GHG emissions dropped sharply. In 2009 alone emissions went down by 7 % compared with the previous year, the largest annual reduction in any one year since reporting began in 1990. The main driving force was the economic crisis. This reduced industrial activity, transport volumes and, as a consequence, energy consumption and emissions. After a rebound in 2010, emissions fell again in 2011. The 3.1 % drop compared to 2010 to a large extent can be explained by mild winter weather in Northern and Western Europe, leading households to use less energy for heating. A higher renewable energy share and lower energy demand due to higher energy prices may also have contributed to emission reductions in some Member States ([12]).

The EU-15 have overachieved their Kyoto target

Under the Kyoto Protocol, the EU-15 committed to cut their combined GHG emissions (without international aviation) by 8 % compared to 1990 levels. This reduction was to be achieved by 2008-2012. In 2011, GHG emissions of the EU-15 were 14.6 % below the base year. The country group thus successfully fulfilled its international commitment ahead of schedule.

Figure 6.2: Greenhouse gas emissions, EU-15
(index Kyoto base year = 100)



NB: Excluding emissions international bunkers and land use, land use change, and forestry (LULUCF)

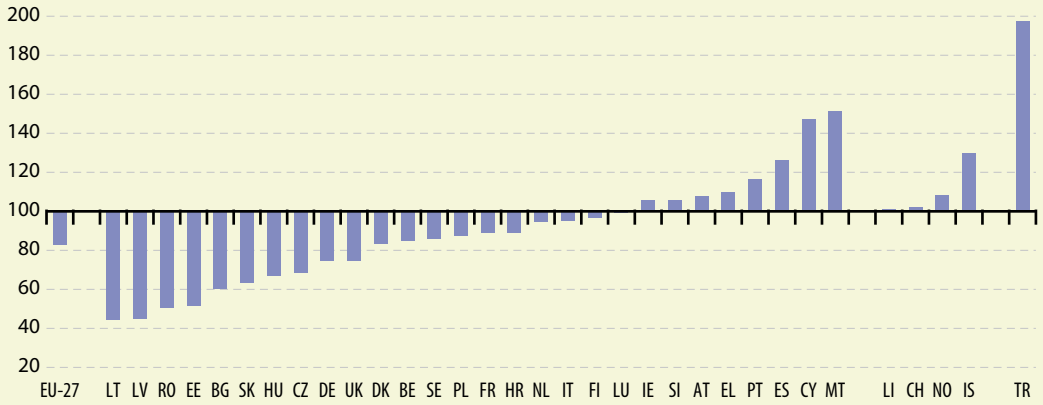
Source: European Environment Agency, Eurostat (online data code: tsdcc100)

([12]) European Environment Agency, *Why did greenhouse gas emissions decrease in the EU in 2011?*, Copenhagen, 2012.

How greenhouse gas emissions vary between Member States

A wide majority of Member States has reduced national GHG emissions between 1990 and 2011. Reductions are highest in Eastern European countries, with Lithuania and Latvia leading with cuts of more than 50 %. By contrast, emissions increased in nine Member States as well as in Liechtenstein, Switzerland, Norway, Iceland and Turkey.

Figure 6.3: Greenhouse gas emissions, by country, 2011
(index 1990 =100)



NB: total emissions, including international aviation, but excluding emissions from land use, land use change, and forestry (LULUCF).

Source: European Environment Agency, Eurostat (online data code: tsdcc100)

European Union Emissions Trading System (EU ETS): *The EU's greenhouse gas reduction target is split into a 21 % reduction in emissions from sectors covered by the (EU ETS) and a reduction of 9.4 % for sectors outside the EU ETS – in both cases relative to 2005 levels. The EU ETS sets a single EU-wide cap for more than 11 000 power stations and industrial plants, and the aviation industry. It allows the economic actors to trade emission allowances among each other. Every year, the cap shrinks so as to reach a 21 % reduction compared to 2005 levels by 2020.*

The EU is on track to achieve its target for the non-ETS sectors

According to the EEA, the EU is making good progress in reducing emissions in sectors not covered under the European Emissions Trading Scheme (EU ETS). Collectively, the EU is on track to achieving its 2020 target of – 9.4 % agreed in the Effort Sharing Decision (ESD). Progress does however vary between Member States. With the exception of Estonia and Luxembourg all countries emitted less than their 2013 interim target in 2012 based on provisional data. But while 14 countries are projected to achieve their 2020 target with existing measures, the other 14 Member States may need to implement additional measures or use flexibility mechanisms to achieve their target ([13]).

Box 6.1: Member States targets under Effort Sharing Decision (ESD)

To achieve the reduction of 9.4 % in sectors not covered by the EU Emissions Trading System (EU ETS) such as transport, buildings, agriculture and waste, each Member State has agreed on a national limit under the Effort Sharing Decision (ESD) ([14]). Member States' targets vary between a 20 % reduction to a 20 % increase in emissions, reflecting differences in starting point and wealth.

Emissions went down in all sectors between 2000 and 2011 with one exception

Of all economic sectors, the manufacturing industries and construction achieved the largest reduction in greenhouse gas emissions between 2000 and 2011. Emissions went down by 142 million tonnes of CO_2 equivalent, equalling a reduction of 20 %. The second largest reduction of 96 million tonnes of CO_2 equivalent or 6 % was achieved in the energy industries, the sector responsible for the largest share of total emissions.

([13]) European Environment Agency, *Trends and projections in Europe 2013. Tracking progress towards Europe's climate and energy targets until 2020*, EEA Report No 10/2013, Copenhagen, 2013 (p. 111–112).
([14]) Decision 2009/406/EC on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse as emission reduction commitments up to 2020.

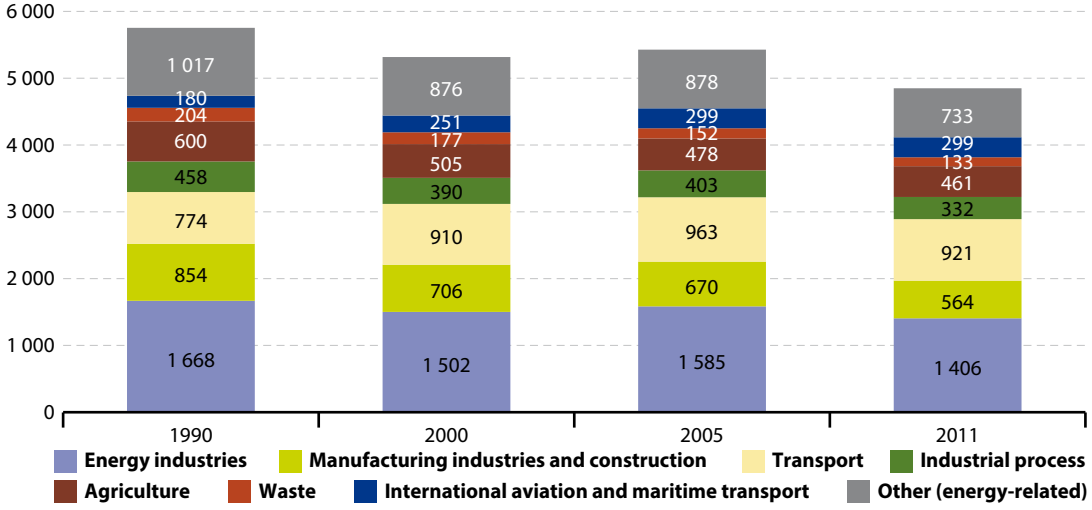
Transport was the exception from the general emissions fall

In contrast, transport emissions were 10 million tonnes above 2000 levels in 2011, an increase of 1.1 %. The sector accounted for 20 % of total EU emissions in 2011, making it the second largest source after the energy industries. Despite the slight increase compared to 2000 levels, the continual upward trend in transport emissions appears to have been broken. After reaching a peak in 2007, emissions went down by 6 % over the following four years. Both the increase between 2000 and 2007 ([15]) as well as the recent decline ([16]) can be linked to corresponding changes in the volume of passenger and freight transport. Causes for the shrinking transport volumes since 2007 may include the economic downturn as well as a hike in fuel prices. In spite of this positive trend, increasing the share of renewable energy and making the transport sector more energy efficient remains crucial to limit the sector's contribution to greenhouse gas emissions, particularly when economic growth picks up again.

Emissions from international bunkers growing fastest

International aviation and maritime transport is the fastest growing source category. Despite a drop during the economic crisis, emissions went up by 19.3 % between 2000 and 2011. Compared to 1990, emissions have increased by 66 % and now amount to 299 million tonnes of CO_2 equivalent, 6.6 % of total emissions.

Figure 6.4: Greenhouse gas emissions by sector, EU-27
(million tonnes of CO_2 equivalent)



NB: Emissions from land use, land use change, and forestry (LULUCF) are excluded.

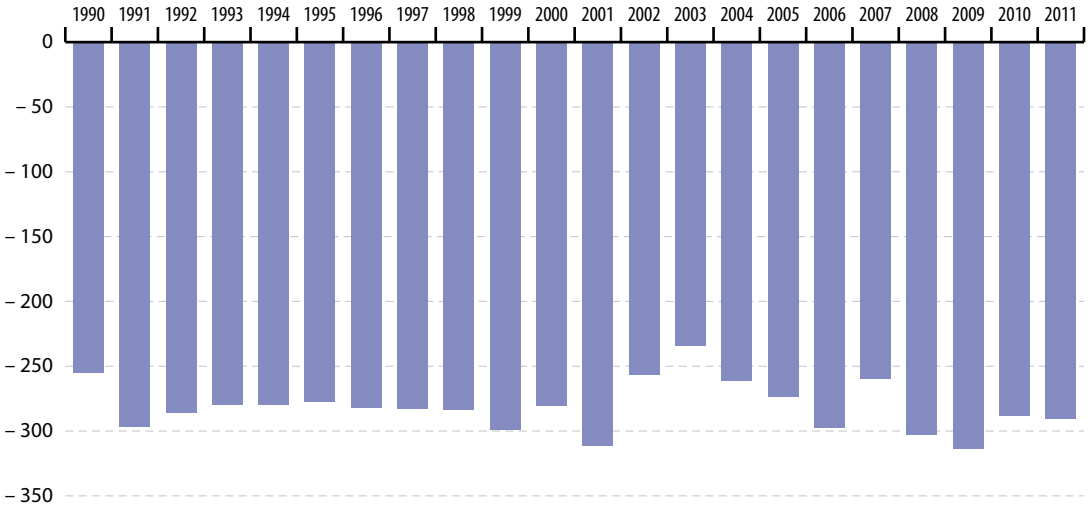
Source: European Environment Agency, Eurostat (online data code: tsdcc210)

Forest management removed CO_2 emissions from the atmosphere between 1990 and 2011

Land use, land use change and forestry (LULUCF) practices can lead to additional greenhouse gas emissions, for example when forests are converted to farmland. In the EU, however, the net effect of LULUCF has been positive between 1990 and 2011. This means that newly planted forests and improved management of existing forests helped to remove GHG emissions from the atmosphere.

([15]) Eurostat, *Driving forces behind EU-27 greenhouse gas emissions over the decade 1999–2008*, Statistics in Focus 10/2011, 2011 (p. 5).
([16]) EEA, *Annual greenhouse gas inventory 1990–2011 and inventory report 2013*, EEA Report No. 8/2013. Copenhagen 2013 (p. 9).

Figure 6.5: Emissions from land use, land use change and forestry (LULUCF), EU-27
(million tonnes of CO_2 equivalent)



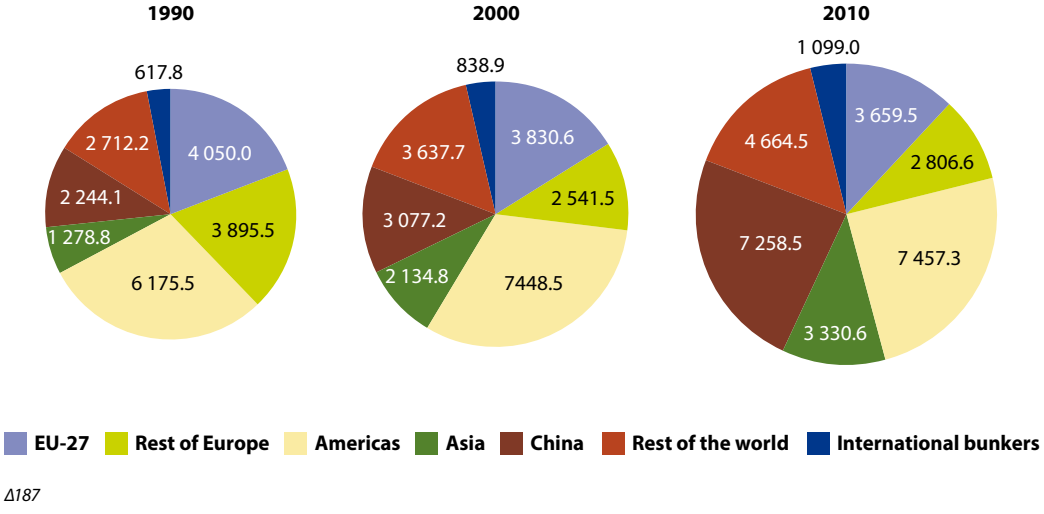
Source: European Environment Agency

CO_2 makes up the largest share of anthropogenic GHG emissions and concentration in the atmosphere. It is the most important single driver of climate change.

EU trends in CO_2 emissions compared with other countries in the world

While emissions in the EU have fallen since 1990, global emissions of CO_2, the most important greenhouse gas ([17]), are going up. Between 1990 and 2010, they rose by 44 %. Most of the increase has taken place in emerging economies. Both in relative and in absolute terms, emission growth was strongest in China. The country's annual CO_2 emissions more than tripled between 1990 and 2010. However, per-capita emissions in China still remained 28 % below EU levels in 2010. Although less important in absolute terms, emissions in the rest of Asia and the rest of the world have also grown significantly in relative terms between 1990 and 2010 (160 % and 72 % respectively). As a result of these trends, the EU's share of global emissions has been shrinking, from almost a fifth in 1990 to 12.1 % in 2010.

Figure 6.6: Global CO_2 emissions from fuel combustion
(million tonnes of CO_2)



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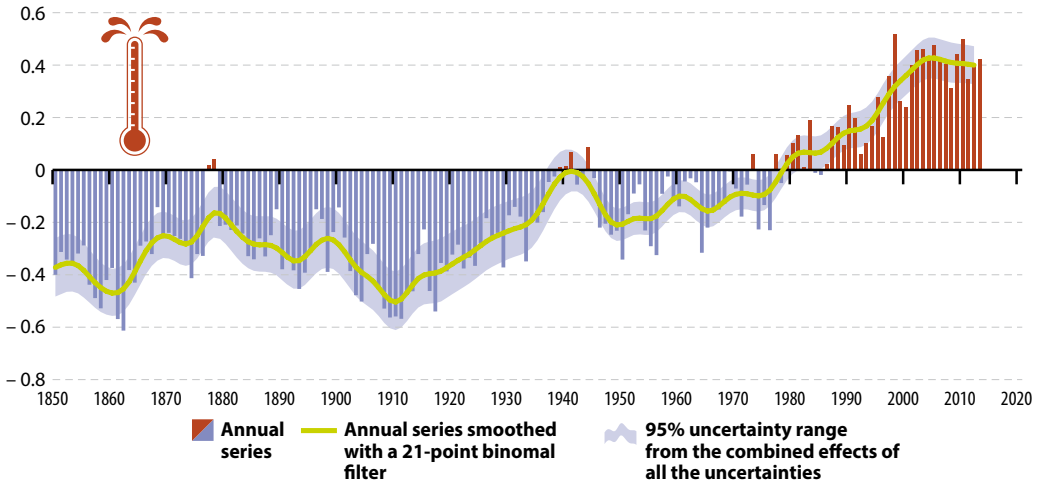
([17]) Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013, *The Physical Science Basis Summary for Policymakers*, Intergovernmental Panel on Climate Change, 2013, fig. SPM-5.

All years between 2001 and 2012 were among the warmest years since records began

Man-made GHG emissions have increased the concentration of greenhouse gases in the atmosphere which in turn has led to a rise in surface temperature. Recordings of the combined global land and marine surface temperature show a clear upward trend. According to the most recent IPCC report, it increased by 0.85 °C between 1880 and 2012 ([18]). The year 2012 was the ninth warmest year on record and all years between 2001 and 2012 were among the top 13 warmest ([19]).

In Europe and globally, the rise in temperature has already led to observable changes in the natural systems and society. Ice sheets in Greenland and Antarctic, the Arctic sea ice and mountain glaciers are shrinking at increasing speed while the sea level rises at a faster rate ([20]). Damage costs from natural disasters have increased and are likely to rise more in the future. Impacts are likely to be spread unevenly across Europe. They threaten to hit regions hardest which already face low economic growth or demographic change ([21]).

Figure 6.7: Global annual mean temperature deviations
(temperature deviation in °C, compared to 1961–1990 average)



Source: Climatic Research Unit, University of East Anglia and the UK Met Office Hadley Centre

What lies beneath this indicator?

The indicator 'greenhouse gas emissions' serves to monitor the EU's contribution to the objective to limit the increase in global average temperature to not more than 2 °C above pre-industrial levels. To achieve this goal, mid- and long-term targets were set for reducing greenhouse gas emissions. The indicator presents annual total emissions as a share of the base year emissions.

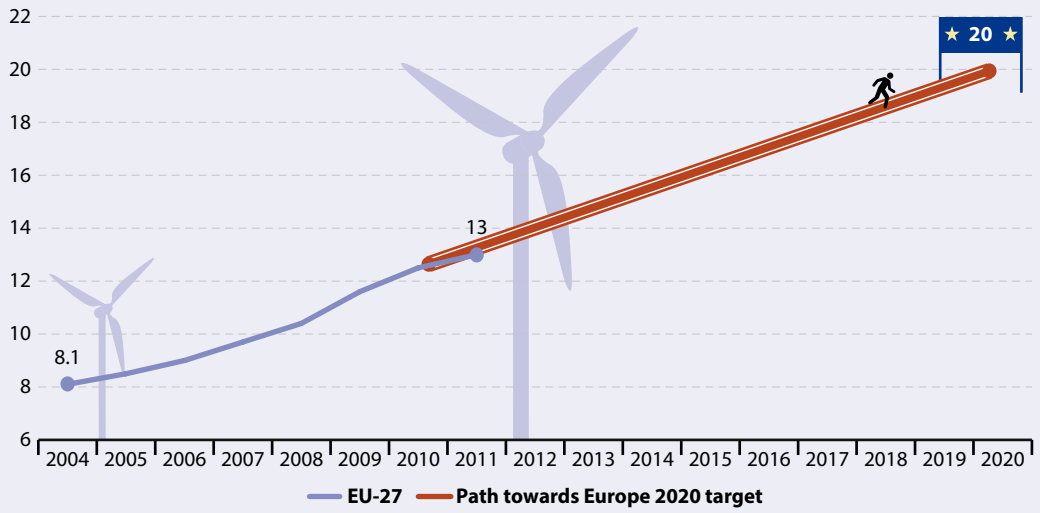
Emissions from international aviation are included, while emissions and sinks related to land use, land-use change and forestry are excluded.

([18]) Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013, *The Physical Science Basis Summary for Policymakers*, Intergovernmental Panel on Climate Change, 2013, p. SPM-3.
([19]) World Meteorological Organization, *WMO statement on the status of the global climate in 2012*, WMO, No 1108, Geneva, 2013, p. 6.
([20]) Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: *The Physical Science Basis Summary for Policymakers,* Intergovernmental Panel on Climate Change, 2013, p. SPM-5-6.
([21]) European Environment Agency, *Climate change, impacts and vulnerability in Europe 2012*, Copenhagen, 2012.

Consumption of renewables

4.9 percentage points increase in the share of renewables in gross final energy consumption in the EU between 2004 and 2011. This favourable trend has put the EU on track to reach its 2020 target

Figure 6.8: Share of renewable energy in gross final energy consumption, EU-27
(%)



Source: Eurostat (online data code: tsdcc110)

The share of renewable energy in gross final energy *consumption indicates how much of the EU's energy demand is covered by wind, solar, biomass and geothermal energy.*

Final energy *is the useful energy supplied to the final consumer for all energy uses (electricity, heating and cooling and transport).*

Between 2004 and 2011, the share of renewable energy had been continuously increasing, reaching a share of 13 % in gross final energy consumption in 2011. There are two main drivers for this increase: support schemes for renewable energy technology and shrinking costs. As a result of policies such as feed-in tariffs, grants, tax credits and quota systems, installed capacity for renewable electricity and heat generation as well as the use of renewable transport fuels has grown steadily over the past decade.

The EU is now the world's biggest renewable energy investor. The scaling up of global production volumes and technological advances have allowed producers to substantially cut costs per unit. Photovoltaic modules have experienced the biggest plunge, with prices falling by 76 % between 2008 and 2012. Onshore wind turbines became 25 % cheaper during the same time period ([22]). Wind and solar installations have started to be economically viable without subsidies, where conditions are favourable.

How consumption of renewables varies between Member States

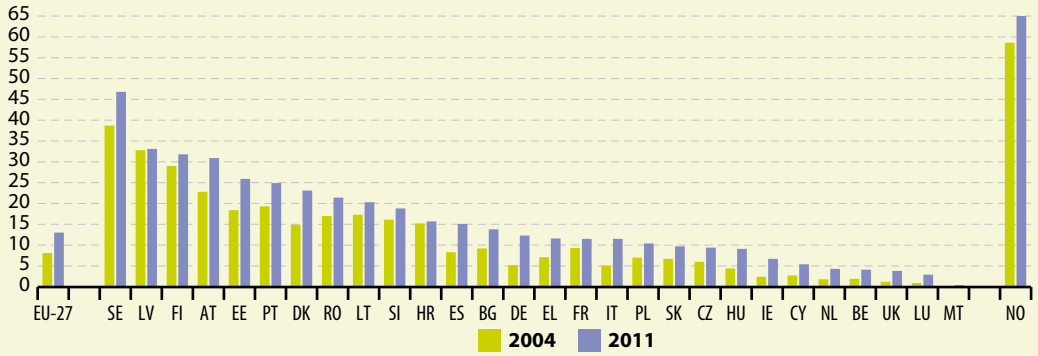
Among Member States the share of renewable energy in gross final energy consumption ranged in 2011 from 46.8 % in Sweden to 0.4 % in Malta. Differences stem from variations in the endowment with natural resources, mostly in the potential for building hydropower plants and in the availability of biomass. All Member States increased their renewable energy share between 2005 and 2011. Eight countries doubled their share, albeit all of them from a small base. Sweden and Bulgaria are the two Member States closest to reaching their target in 2011, closely followed by Romania, Lithuania and Norway. Farthest away from their targets are the UK and France.

([22]) McCrone, Angus et al, *Global Trends in Renewable Energy Investment 2012,* Frankfurt School of Finance and Management, commissioned by UNEP's Division of Technology, Industry and Economics (DTIE) and endorsed by REN21, Frankfurt, 2012 (p. 32).

Box 6.2: Member States targets for renewable energies

The EU target has been broken down into national targets that reflect differences in resource base and wealth. The target for renewables in transport, by contrast, amounts to 10 % for all Member States. To ensure that the renewable energy targets are met, the Renewable Energy Directive ([23]) requires Member States to put in place support schemes and to remove administrative barriers with respect to authorisation, certification and licensing of renewable energy plants. In 2010 all Member States developed national renewable energy action plans (NREAPs), detailing how they plan to achieve their target, including interim targets and trajectories per sector and technology. Based on this planned development they report on their progress to the European Commission every two years. In addition, Member States also report on their national renewable energy targets in the National Reform Programmes under the Europe 2020 strategy.

Figure 6.9: Share of renewable energy in gross final energy consumption, by country
(%)



NB: Data for BE are provisional.

Source: Eurostat (online data code: tsdcc110)

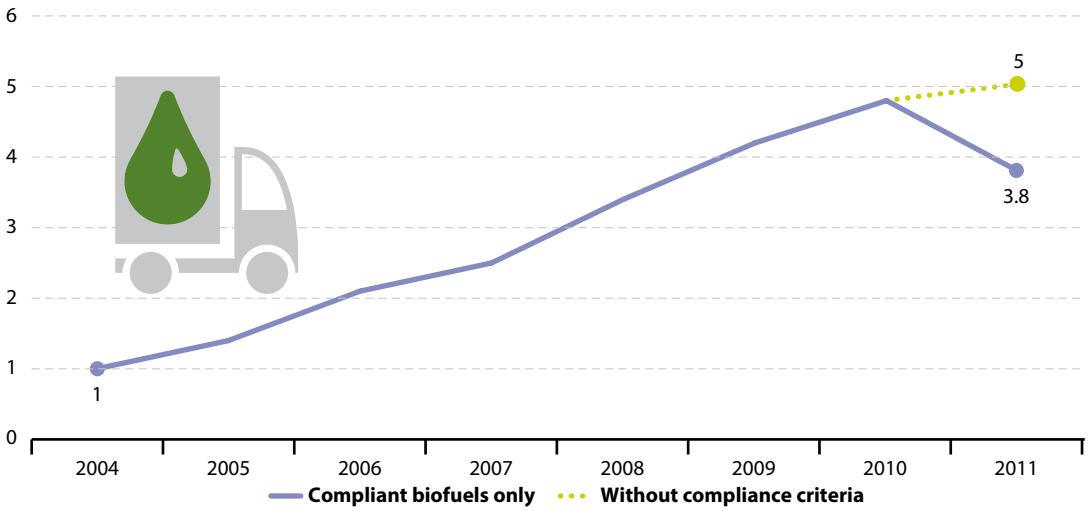
In the transport sector, the positive trend towards more renewable energy use has not continued

While the final energy consumption in the EU transport sector has remained stable since 2004, the share of renewable energy in transport grew steadily from 1 % to about 4.8 % between 2004 and 2010. Nonetheless, the EU failed to reach its interim target of 5.75 % for 2010. In 2011, the share of renewable energy in EU transport went down by about a fifth to 3.8 %. However, this sudden drop reflects statistical adjustments due to the fact that not all Member States have fully transposed the sustainability criteria for liquid biomass laid down in the Renewable Energy Directive, and the fact that Directive 2009/28/EC prescribes that only compliant (sustainable) biofuels can be counted towards the target. If biofuels from countries without full implementation are included, the share of renewable energy in fuel consumption stood at 5 % in 2011.

The increase in renewable energy consumption in transport between 2004 and 2010 was mainly based on the use of biofuels, driven by the widespread introduction of support systems at national level. Member States use tax rebates or biofuel obligations to promote renewable energy consumption in road transport ([24]). Governments have also set national targets as required by the Directive on renewable energy in transport ([25]), some of which are above the minimum 10 % target required for 2020 ([26]).

([23]) Directive 2009/28/EC on the promotion of the use of energy from renewable sources.
([24]) Commission Staff Working Document, *Recent progress in developing renewable energy sources and technical evaluation of the use of biofuels and other renewable fuels in transport*, SEC(2011) 130.
([25]) Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport.
([26]) Geeraerts, K. et. al. *National Legislation and national initiatives and programmes (since 2005) on topics related to climate change.* European Parliament's Temporary Committee on Climate Change. 2007 (p. 41).

Figure 6.10: Share of renewable energy in fuel consumption of transport, EU-27
(%)



Source: Eurostat (online data code: tsdcc340)

Box 6.3: Transport energy sources

Oil counts for over 90 % of the energy consumed in the transport sector. Due to a lack of sufficient oil sources in the EU, the largest fraction is imported, leading to a substantial deficit in the trade balance (see the indicator 'Energy dependence' in this chapter).

With regard to alternative fuels, the European Commission launched a clean fuel strategy to break oil dependency and to grasp the economic opportunities ([27]). The strategy is set to meet the long-term needs of all transport modes and addresses the following priority fields:

- Alternative fuels infrastructure: The underlying proposal aims to provide sufficient infrastructure coverage to ensure economies of scale on the supply side and network effects on the demand side ([28]).
- Common technical specifications for the interface between electric vehicles and recharging points ([29]).
- Consumer acceptance to generate an adequate demand for alternative fuels.
- Research and development priorities for alternative fuels in all transport modes ([30]).

What lies beneath this indicator?

Given that energy consumption is the single largest source of greenhouse gas emissions in the EU, renewable energies that emit low or no greenhouse gas are an important lever to address climate change and reduce the EU's dependence on imported fossil fuels. The indicator measures progress towards the EU target to provide 20 % of final energy consumption from renewable sources by 2020 ([31]).

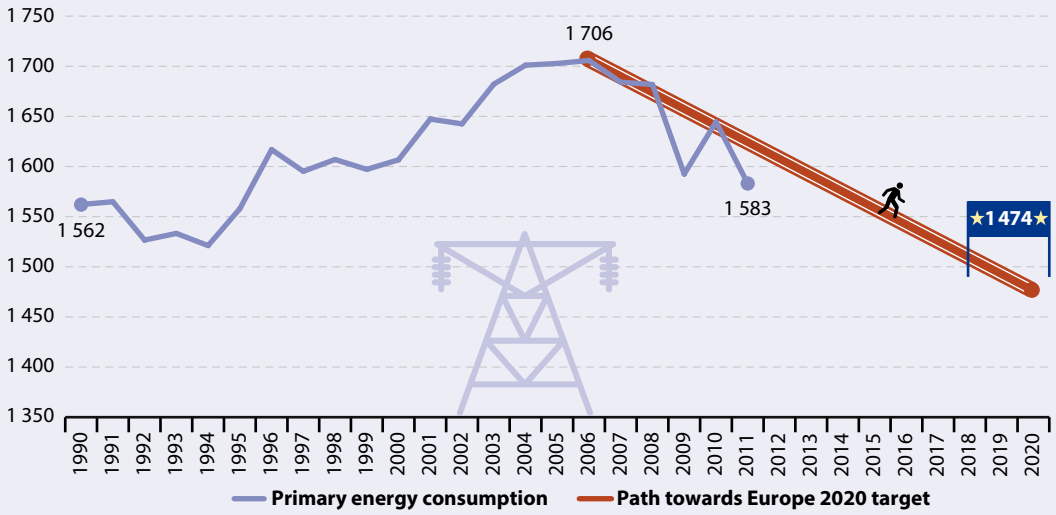
The indicator "Consumption of renewables" is defined as the share of renewables in gross final energy consumption, which refers to the quantity of energy consumed within a country's border. The energy sources taken into account are hydro, geothermal, wind and solar power, and biomass and the biodegradable fraction of waste.

([27]) European Commission, *Clean Power for Transport: A European alternative fuels strategy*, COM(2013) 17 final, Brussels, 24.1.2013.
([28]) European Commission, *Proposal for a Directive on the deployment of alternative fuels infrastructure*, COM(2013) 18 final, Brussels, 24.1.2013.
([29]) European Commission, *CARS 2020: Action Plan for a competitive and sustainable automotive industry in Europe*, COM(2012) 636 final, Brussels, 8.11.2012.
([30]) European Commission, *Research and innovation for Europe's future mobility, developing a European transport-technology strategy*, COM(2012) 501 final, Brussels, 13.9.2012.
([31]) Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

Energy efficiency

1.5 % less primary energy consumed in the EU in 2011 compared to 2000, but the trend is not continuous. The EU is moving towards the 2020 target of improving energy efficiency by 20 %, but sustained efforts are required

Figure 6.11: Primary energy consumption, EU-27
(million tonnes of oil equivalent (Mtoe))



Source: Eurostat (online data code: tsdcc120)

Primary energy consumption, the indicator used to assess progress towards the Europe 2020 strategy's energy efficiency target, showed an upward trend between 1990 and 2006, but fell sharply in 2009 following the economic crisis. It rose again in 2010 with the slight recovery of the EU's economy, but fell again in the next year. In 2011, the EU consumed roughly as much primary energy as it did in 1990 and 7 % less than in 2005, the base year of the EU's headline target to increase energy efficiency by 20 %. In absolute terms, the efficiency target means that by 2020, EU primary energy consumption should be reduced from the projected consumption of 1 842 Mtoe in the reference scenario to 1 474 Mtoe ([32]). If the average annual rate of reduction observed between 2006 and 2011 can be maintained in the future, the EU will achieve its energy efficiency target in 2020.

Reduction in primary energy demand linked to low economic performance

However, it is important to note that the recently achieved reduction in primary energy consumption is only partly due to efficiency improvements. The original projections of 2007 assumed that GDP would grow steadily after 2007. Since GDP growth is one of the key drivers of energy consumption, the low economic performance in the EU partly explains the observed reduction. Structural changes and fuel switches also contributed to lower primary energy consumption ([33]). Finally, with respect to the most recent drop of 3.7 % between 2010 and 2011, a mild winter resulting in lower heating demand also played a role ([34]). The analysis underlines the need to further pursue energy efficiency measures so as to ensure that primary energy consumption will decrease further when growth accelerates again ([35]).

Primary energy consumption *measures the total energy demand of a country. It covers consumption of the energy sector itself, losses during transformation (for example, from oil or gas into electricity) and distribution of energy, and the final consumption by end users. It excludes energy carriers used for non-energy purposes (such as petroleum not used not for combustion but for producing plastics).*

([32]) Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.
([33]) European Environment Agency, *Trends and projections in Europe 2013. Tracking progress towards Europe's climate and energy targets until 2020*, EEA Report No 10/2013, Copenhagen, 2013 (p. 128).
([34]) European Environment Agency, *Why did greenhouse gas emissions decrease in the EU in 2011?*, Copenhagen, 2012.
([35]) Eurostat, *Energy saving statistics explained* (accessed 20 November 2013); European Environment Agency, *Trends and projections in Europe 2013. Tracking progress towards Europe's climate and energy targets until 2020*, EEA Report No 10/2013, Copenhagen, 2013 (p. 128).

How energy efficiency varies between Member States

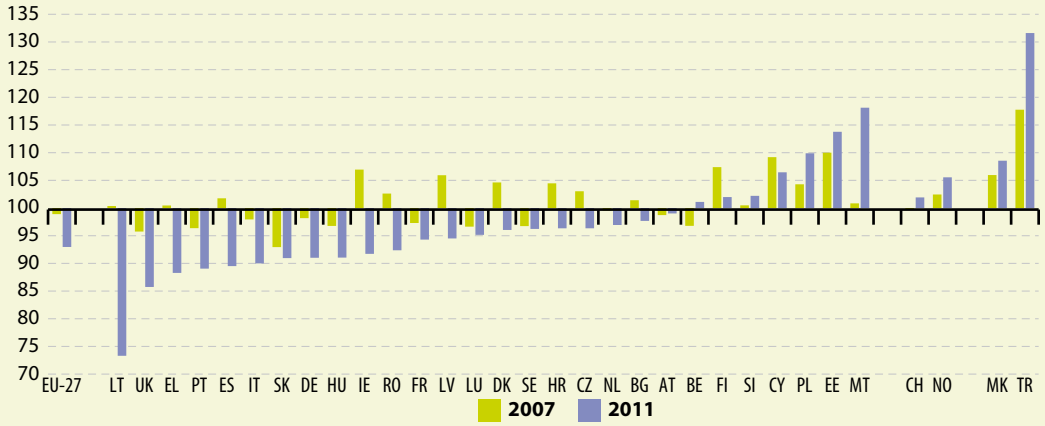
Twenty-one out of the 28 Member States reduced primary energy consumption between 2005 and 2011 by values ranging from 1 % to 27 %. In absolute terms, Germany, France, Spain, Italy and the UK achieved the highest reductions ([36]). In the other seven Member States, primary energy consumption has gone up 1 % to 18 % since 2005, stressing the importance of additional efforts to improve energy efficiency.

All Member States except Estonia and Malta lowered primary energy intensity between 2005 and 2011. This means countries are producing more GDP with every unit of primary energy they consume. Collectively, the EU has lowered primary energy by 30 % between 1990 and 2011 ([37]).

Box 6.4: Member States targets for energy efficiency

In contrast to the Renewable Energy Directive, the EU Energy Efficiency Directive 2012/27/EU does not include an effort sharing agreement. It instead allows Member States to set their own indicative national energy efficiency targets. In doing so, Member States can choose to base their targets on either primary or final energy consumption, primary or final energy savings, or energy intensity ([38]). Member States notified their targets to the European Commission by the end of April 2013 ([39]) and the Commission is now assessing if the individual national targets add up to the savings agreed at EU level. Member States must report their progress on achieving their national energy efficiency targets every year as of 2013.

Figure 6.12: Change in primary energy consumption, by country
(index 2005 = 100)



NB: 2010 data (instead of 2011) for CH.

Source: Eurostat (online data code: tsdcc120)

([36]) European Environment Agency, *Trends and projections in Europe 2013. Tracking progress towards Europe's climate and energy targets until 2020*, EEA Report No 10/2013, Copenhagen, 2013 (p. 128).
([37]) European Environment Agency, *Trends and projections in Europe 2013. Tracking progress towards Europe's climate and energy targets until 2020, EEA Report No 10/2013*, Copenhagen, 2013 (p. 130, 132).
([38]) Directive 2012/27/EU on energy efficiency, Art. 3.
([39]) European Commission, *Europe 2020 targets: climate change and energy* (accessed 29 May 2013).

Reductions in energy consumption have been highest in the industrial sector

Between 1990 and 2011, the agriculture and forestry sector as well as industry reduced final energy consumption by 27.7 % and 21.7 % respectively. In absolute terms, the reduction in the industry sector of 79 million tonnes of oil (Mtoe) to 287 Mtoe in 2011 is the largest. In contrast, energy consumption in the services and transport sectors went up by about a third over the same time period. In 2011, the transport sector consumed 364 Mtoe and the service sector 140 Mtoe.

These changes reflect sector-specific levels of energy efficiency improvement, but also relate to structural changes in the EU economy, particularly a shift away from an energy-intensive industry to a service-based economy. In the case of transport, rising volumes of freight and passenger transport have outweighed efficiency gains. Except for annual fluctuations due to weather changes, the residential sector's consumption remained more or less stable between 1990 and 2011.

Despite recent progress in reducing energy consumption, substantial cost-efficient potential for improvements in energy efficiency remain. A case in point is the refurbishment of residential and commercial buildings. Other areas include transport, green procurement in the public sector, and savings along the energy supply chain from extraction to distribution.

Progress in expanding combined heat and power remains slow

The share of combined heat and power (CHP) in gross electricity generation in the EU reached 11.7 % in 2010, up from 10.5 % in 2004. Even though the data need to be treated with caution due to changes in calculation methods over time, it is notable that progress in expanding CHP technology is relatively slow, reflecting various economic and administrative barriers still facing cogeneration investments.

What lies beneath this indicator?

Energy efficiency means delivering the same service or product with less energy input. It is one of the most cost-effective options for reducing greenhouse gas emissions and enhancing security of energy supply. The measures with the largest potential for cost-effective efficiency improvements are insulation of buildings, energy-efficient vehicles and energy-efficient processes and products in industry ([40]). In addition to environmental benefits, lower energy consumption can bring significant health benefits by reducing air pollution.

The 'Primary energy consumption indicator' encompasses all gross inland consumption except for non-energy use of energy carriers (for example natural gas used not for combustion but for producing chemicals). This quantity is relevant for measuring the true energy consumption and for comparing it to the Europe 2020 targets.

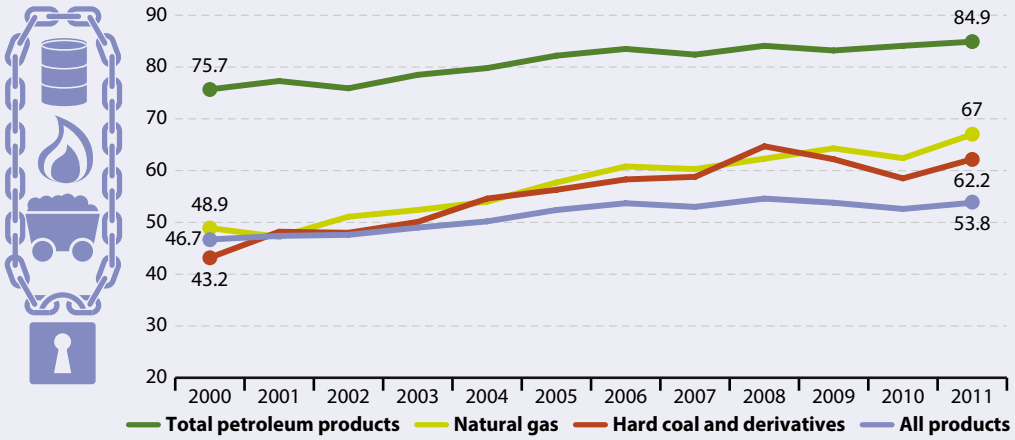
Combined heat and power (CHP): *by recovering and using the heat produced as a by-product, CHP or cogeneration significantly increases the amount of useful heat and electricity produced from each tonne of fuel. CHP plants exist in various scales ranging from micro-CHP used in single family homes to large-scale facilities. The heat delivered may be used for processing or space-heating close to the CHP plant or distributed through district heating networks.*

([40]) Commission communication, *Energy Efficiency Plan 2011*, COM(2011) 109 final.

Energy dependence

Net energy imports into the EU increased by 15 % between 2000 and 2011. However, the upward trend levelled off in 2006 due to lower energy demand in the EU

Figure 6.13: Energy dependence, EU-27
(share of imports in total energy consumption, %)



NB: 'Total' is not the average of the other three fuel categories shown. It also includes other energy sources, such as renewable energy or nuclear energy, which are treated as domestic sources.

Source: Eurostat (online data code: tsdcc310)

The share of total energy needs provided by imports from non-EU countries increased significantly over the past two decades, reaching 53.8 % in 2011. Fossil fuels make up the largest share of total energy imports. Between 2000 and 2011 the level of dependence was highest for petroleum products, but increased most for natural gas followed by hard coal.

Lower EU oil and gas production and higher demand increase energy dependence

The rise in energy imports is driven by the decline of oil and gas production within the EU, mainly in the North Sea. Until 2006, higher overall primary energy demand was an additional cause for rising imports. The reversal of this upward trend since the onset of the economic crisis (see indicator 'Primary energy demand') has also stopped the share of imports in total energy consumption from rising further. The increase in renewable energy consumption might have also played a role (see indicator 'Consumption of renewables').

What lies beneath this indicator?

Being reliant on non-EU energy sources exposes the European economy to a high price volatility, significant costs and the risk of supply shortage. Securing energy supplies is therefore high on the EU's agenda. It is an objective of the EU Sustainable Development Strategy, the EU Climate and Energy Package and the Energy 2020 strategy ([41]). Energy dependence can be lowered by reducing primary energy demand and increasing the share of energy consumption covered by renewables, most of which can be procured from within the EU.

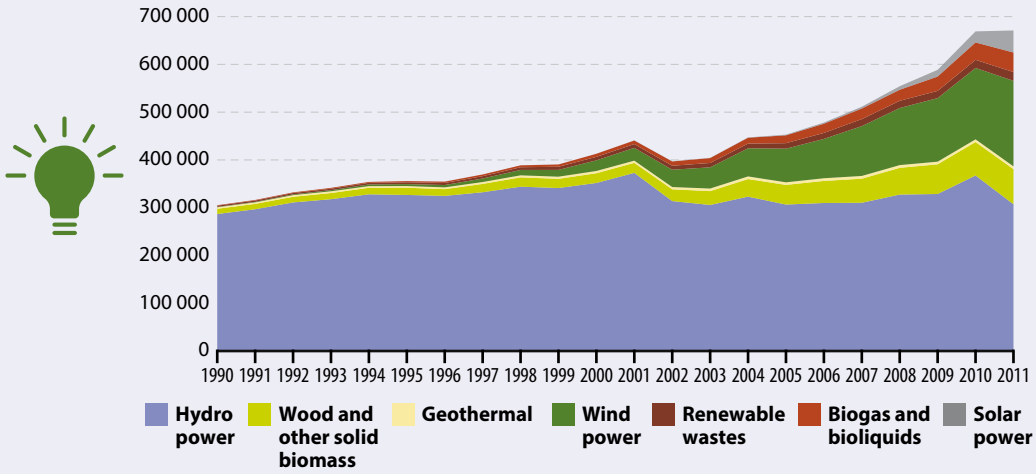
Energy dependence is calculated as net imports divided by the sum of gross inland energy consumption and maritime bunkers. Hence, it describes the extent to which an economy relies on imports to meet its energy needs.

([41]) Commission communication, *Energy 2020: A strategy for competitive, sustainable and secure energy*, COM(2010) 639.

Electricity generation from renewables

About a fifth of EU gross electricity generation came from renewable sources in 2011, up from 13.6 % in 2000. Effective support schemes and lower production costs have enabled the expansion

Figure 6.14: Gross electricity generation from renewable energy sources, EU-27, 1990–2011 (gigawatt hours)



Source: Eurostat (online data code: nrg_105a)

The share of gross electricity from renewable sources went up by 50 % between 2000 and 2011, almost four times as fast than during the 1990s. With a share of renewables of 20.4 % in 2011, the electricity sector contributes to reaching the renewable energy target (see 'consumption of renewables' indicator) ([42]). National promotion policies such as feed-in tariffs, grants, tax credits and quota systems have enabled this expansion.

Hydro power delivers the largest share of all renewable electricity, but wind and solar are growing fastest

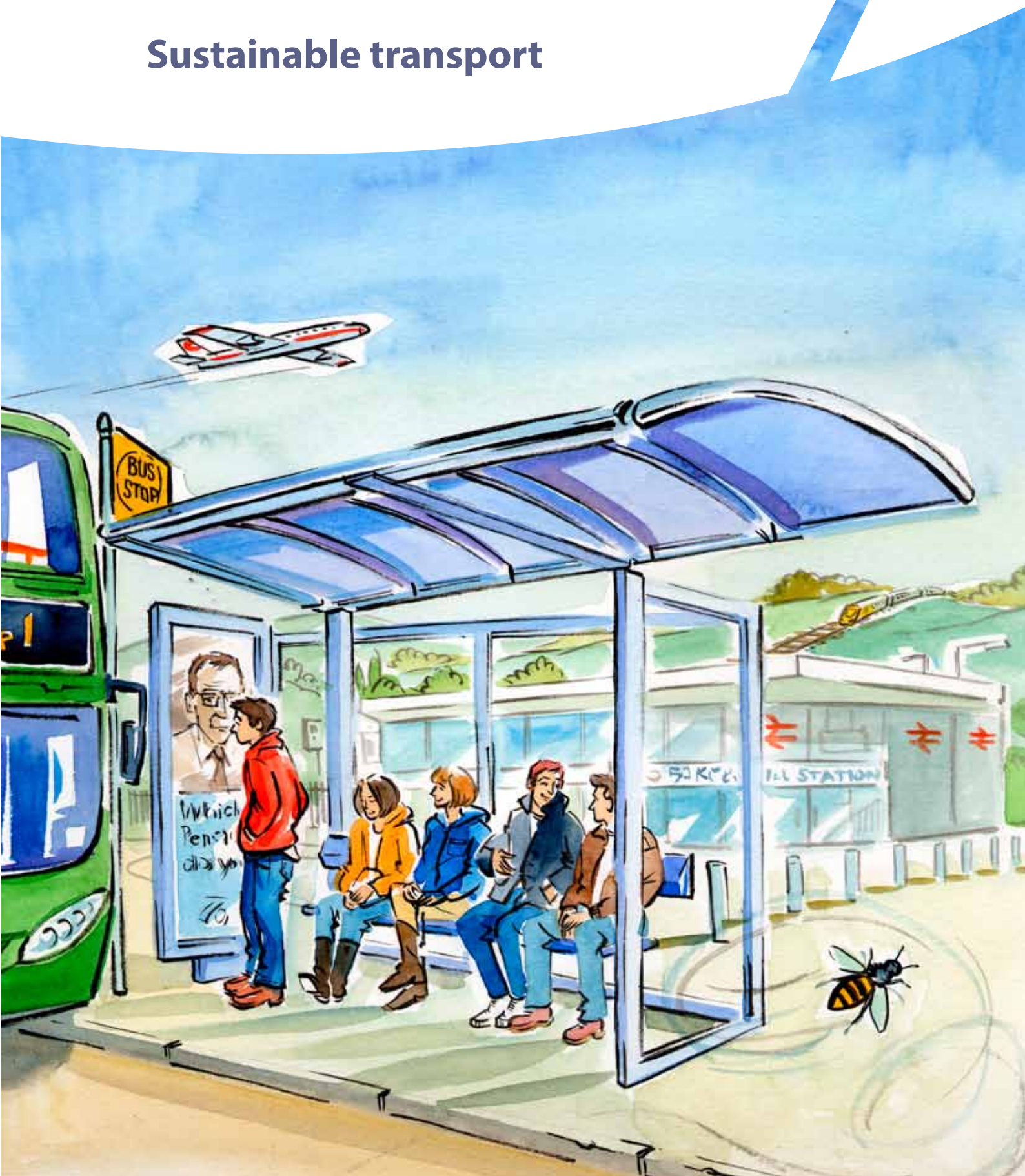
Hydro power delivered slightly less than half of all renewable electricity (45.8 %), wind power a bit more than a quarter (26.7%). The remaining quarter is provided from biomass and biogas (17 %), solar energy (6.9 %), renewable wastes (2.7 %) and a small contribution comes from geothermal energy (0.9 %). Wind and particularly solar energy have grown fastest since 2005. The scaling up of global production volumes and technological advances have allowed producers to substantially cut costs. As a result, wind and solar installations start to be economically viable without subsidies, where weather conditions are favourable.

What lies beneath this indicator?

Renewable energy sources include wind, hydro, solar and geothermal energy as well as biomass. They are considered to produce negligible or zero greenhouse gas emissions. Both the EU Sustainable Development Strategy and the Renewable Energy Directive ([43]) aim to increase power generation from renewable energy sources to reduce greenhouse gas emissions and dependence on energy imports. The indicator is defined as the share of electricity produced from renewables in gross electricity consumption. This equals the domestic electricity production, plus imports and minus exports. Given that the indicator is not calculated according to Directive 2009/28/EC, the data cannot be compared to the data on renewable electricity ('RES-E') reported by the European Commission in its progress report on renewable energies.

([42]) Ecofys et al., *Renewable energy progress and biofuels sustainability*, London, 2012 (p. 38).
([43]) Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

7 Sustainable transport



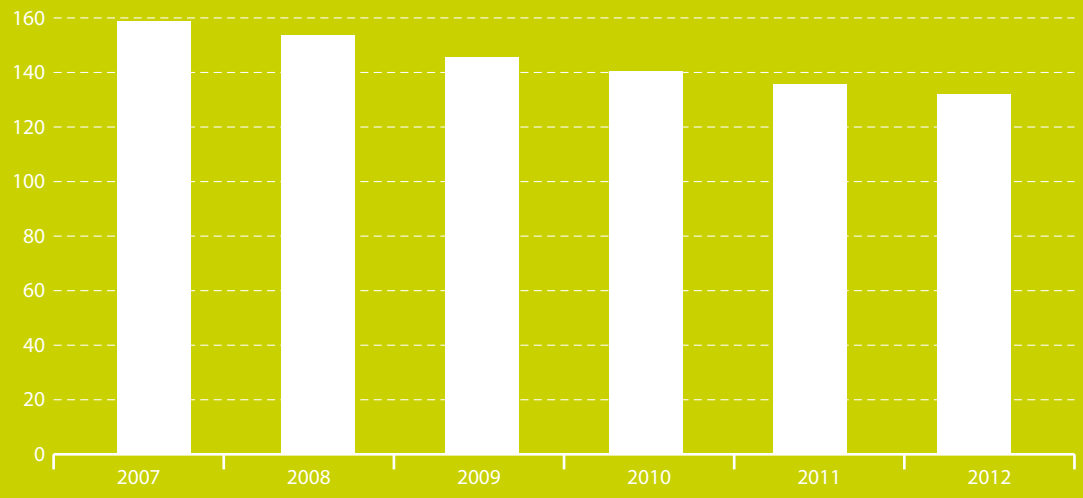
Sustainable transport seen through the lens of the Green Economy

New passenger cars are becoming more and more 'carbon-efficient'

Carbon dioxide (CO_2) emissions of the average car sold in the EU fell by 16.7 % between 2007 and 2012, cutting the EU average to 132.2 grams of CO_2 per kilometre. This is close to the 130 gram target for the average new car sold in 2015.

According to the European Environment Agency, based on emission levels recorded in vehicle tests, all major car manufacturers ([1]) have met their targets for their fleet in 2012. However, most will need to sell increasingly efficient vehicles to meet targets in 2015 and beyond. Each manufacturer has a different target, based on the average mass of their fleet, which is gradually phased in, meaning that in 2012 only 65 % of each manufacturer's fleet needed to meet the target, increasing to 100 % of cars in 2015. By 2020, the average car sold in the EU must not emit more than 95 grams of CO_2 per km ([2]).

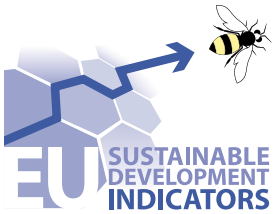
Average carbon dioxide emissions per km from new passenger cars, EU-27
(gram of CO_2 per km)



NB: 2012 data are provisional.

Source: **Eurostat (online data code: tsdtr450)**

([1]) 'Large car manufacturers' are defined as the 20 companies selling more than 100 000 cars in 2012.
([2]) European Environment Agency, *All larger carmakers met CO_2 targets in 2012* (accessed 4 December 2013).



Overview of main changes

Transport volumes as well as energy consumption and greenhouse gas emissions from transport are all strongly dependent on economic activity. In the aftermath of the economic and financial crisis, EU economies are still confronted with challenging conditions. This means the evaluation results of the transport indicators should be interpreted carefully. The economic downturn has led to decreasing transport volumes, and as a consequence has also substantially reduced energy consumption and greenhouse gases. These tendencies have lowered the pressure of transport's environmental impacts. Only time will tell whether this is a temporary or long-term trend and whether economic recovery will affect transport's performance.

Table 7.1: Evaluation of changes in the sustainable transport theme (EU-27, from 2000) (1)

Level 1	Level 2	Level 3
	Transport and mobility	
	Modal split of freight transport	
	Modal split of passenger transport	
Energy consumption of transport relative to GDP		
	Transport impacts	
	Greenhouse gas emissions from transport	
	People killed in road accidents (*)	

(*) From 2001

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.

Why do we deal with sustainable transport?

Transport plays an essential role in modern society. It is an economic driver, and allows people to commute and to travel. Therefore, transport matters. And more than ever, companies and individuals in the EU are taking advantage of these huge benefits. However, the EU's transport system is not yet sustainable. Growing transport activities put more and more pressure on natural resources and on society. Emissions of greenhouse gases, air pollutants or noise from transport affect the climate, the environment and human beings. Rising energy consumption requires more resources, and transport infrastructure fragments landscapes and ecosystems on a large scale. Increased transport activities and fatal accidents cause social costs and time losses due to congestion. Addressing these challenges also means taking a global look at developments in the transport sector.

Analysing the transport sector in the context of sustainable development reveals trade-offs between its advantages, for example, in enabling job creation, and its negative impacts, for example oil dependency or road fatalities. As more goods are transported and more people are making longer journeys, more energy is needed to satisfy the increasing demand for transport. Thus, energy consumption relative to GDP monitors the linkage of transport and economic growth and highlights an important trade-off that yet has to be overcome.

The issue of transport and mobility covers performance and modes. While freight- or passenger-kilometres show trends in the basic demand for transport, the chosen transport modes indicates the level of possible negative impacts. Because the characteristics and environmental impacts of different transport modes vary, a Member State's modal split indicates whether a shift towards more environmentally friendly forms of transport is under way. This issue looks at the driving forces behind the impacts of transport on the environment and on society.

Transport activities do have environmental and societal impacts — on a local and a global scale. Transport emissions of greenhouse gases influence climate change with worldwide impacts; air pollutants affect building surfaces and the biosphere and lead to health problems; noise has negative impacts on human beings on a local level; and growing transport flows cause more congestions and fatalities or injuries. Monitoring of these interlinkages helps to provide an indication of whether the corresponding sustainable development objectives can be achieved.

How does the EU tackle sustainable transport?

The EU Sustainable Development Strategy (EU SDS) ([2]) dedicates one of its seven key challenges to sustainable transport, with the overall objective to 'ensure that our transport systems meet society's economic, social and environmental needs whilst minimising their undesirable impacts on the economy, society and the environment'.

The EU SDS operational objectives and targets:

- Decoupling economic growth and the demand for transport with the aim of reducing environmental impacts.
- Achieving sustainable levels of transport energy use and reducing transport greenhouse gas emissions.
- Reducing pollutant emissions from transport to levels that minimise effects on human health and/or the environment.
- Achieving a balanced shift towards environment friendly transport modes to bring about a sustainable transport and mobility system.
- Reducing transport noise both at source and through mitigation measures to ensure overall exposure levels minimise impacts on health.
- Modernising the EU framework for public passenger transport services to encourage better efficiency and performance by 2010.
- In line with the EU strategy on CO_2 emissions from light duty vehicles, the average new car fleet should achieve CO_2 emissions of 140g/km (2008/09) and 120g/km (2012).
- Halving road transport deaths by 2010 compared with 2000.

The Europe 2020 strategy ([3]) unites two flagship initiatives under the sustainable growth priority to tackle the issue of sustainable transport:

- 'Resource efficient Europe' supports the shift towards a resource-efficient, low-carbon economy. This flagship initiative provides a framework for actions in many policy areas including transport. One of the key components is a roadmap presenting a vision for a transport system by 2050 that promotes clean technologies.
- 'An industrial policy for the globalisation era' highlights ten key actions for European industrial competitiveness, including a more efficient European transport infrastructure and services.

The European Commission adopted a roadmap of 40 concrete initiatives in form of a Transport White Paper:

- European Commission, Roadmap to a Single European Transport Area — Towards a competitive and resource efficient transport system, COM(2011) 144 final, Brussels, 2011.

Further reading on sustainable transport

European Commission, *20 years of the single market, 20 achievements in transport*, Publications Office of the European Union, Luxembourg, 2013.

European Commission, Eurostat, *Energy, transport and environment indicators*, 2012 edition, Publications Office of the European Union, Luxembourg, 2013.

European Environment Agency, *The contribution of transport to air quality, TERM 2012: transport indicators tracking progress towards environmental targets in Europe*, EEA Report No 10/2012, November 2012, Copenhagen.

OECD, International Transport Forum, *Road Safety Annual Report 2013*, IRTAD Annual Report 2013, Paris.

OECD, International Transport Forum, *Trends in the Transport Sector 1970–2010*, 2012, Paris.

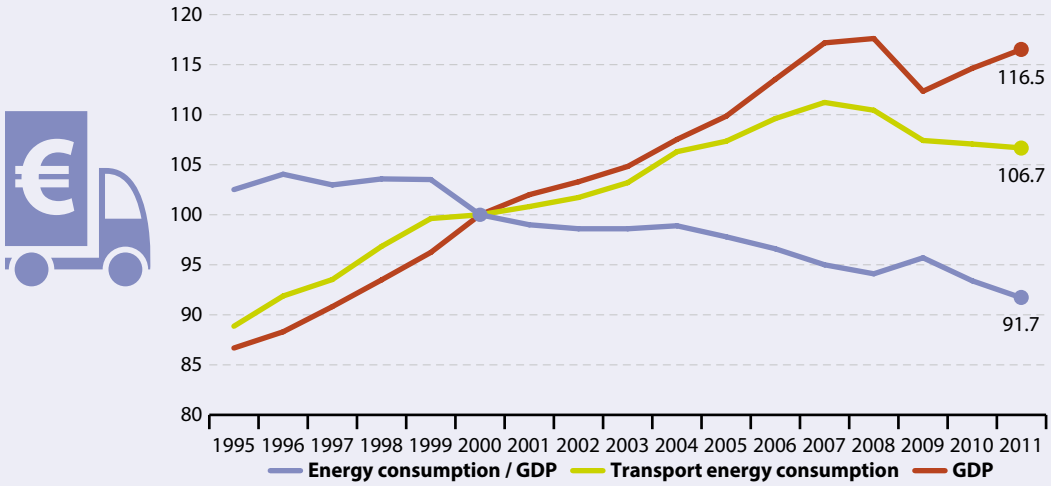
OECD, International Transport Forum, *Transport Outlook 2012: Seamless Transport for Greener Growth*, 2012, Paris.

([2]) Council of the European Union, *Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy*, 10917/06, Brussels, 2006.
([3]) European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010 (p. 11).

Energy consumption of transport relative to GDP

8.3 % drop in energy consumption of transport per unit of GDP in the EU between 2000 and 2011. But economic growth still meant transport energy use increased over the period

Figure 7.1: Energy consumption of transport relative to GDP, EU-27
(index 2000 = 100)



NB: Energy consumption of transport includes all modes of transport, with the exception of maritime and pipeline transport.

Source: Eurostat (online data codes: tsdtr100, tsdtr250 and nama_gdp_k)

Energy consumption of transport relative to GDP (the amount of transport energy that is used for one unit of GDP) has declined since 1999. In 2011 30.7 grams of oil equivalent for each EUR of GDP were used to satisfy the total transport demand in the EU, compared with 33.5 grams in 2000. This ongoing, almost steady decline indicates a relative decoupling over the period evaluated.

During the pre-crisis period 2000 to 2007 both the EU economy and transport energy use were constantly rising, the former at a faster pace than the latter. The economic crisis shifted the demand for energy in transport and in 2008 absolute decoupling against 2007 was observed for the first time with GDP registering a slight growth while energy use was falling. In the following years transport energy use continued shrinking even when the EU economy went into recovery. As a result, absolute decoupling was again recorded between 2009 and 2011. However, it is too early to tell whether this trend will persist. How GDP and the transport sector's energy performance respond to economic recovery are still to be seen.

Road transport is the transport mode using most energy but...

Road transport accounted for 82.4 % of transport energy consumption in the EU in 2011, followed by international aviation with 12.3 %. Since 2000 no substantial shift between the shares of the different transport modes has been visible.

...not because of low energy efficiency

Road transport is not only the largest consumer of transport energy, it also the most widely used mode. Thus, the high energy consumption is not necessarily a direct consequence of inadequate energy efficiency. In fact, the energy efficiency of cars has been improving steadily ([4]).

Decoupling indicators *show the interdependence between two spheres. Decoupling is calculated by dividing an environmental pressure variable by an (economic) driver variable.*

Relative decoupling *occurs when the driving force grows faster than the environmental pressure.*

Absolute decoupling *means environmental pressure is stable or decreasing while the economic driving force is growing. Thus, absolute decoupling is the genuine separation of environmental pressures from economic growth.*

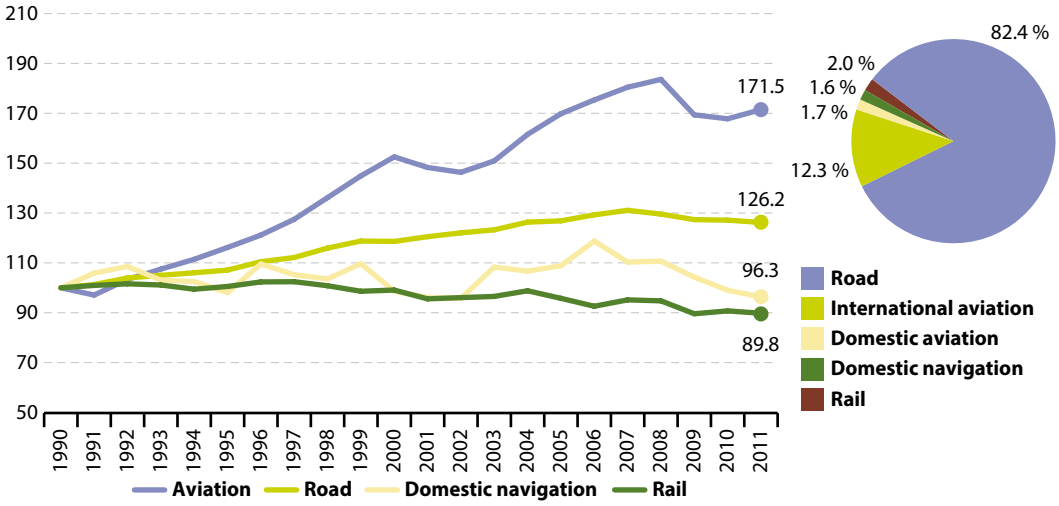
([4]) Enerdata, *Energy Efficiency Trends in the Transport sector in the EU, lessons from the ODYSSEE MURE project*, Grenoble, 2013. ; see also the indicator 'consumption of renewable energy in transport' in the climate change and energy chapter.

Post-crisis downward spiral in energy consumption but not for all transport modes

The energy consumption of road transport has been declining since 2007. This is the main reason behind the absolute decoupling registered between 2009 and 2011. On the other hand, energy consumption in international aviation, following an after-crisis fall of energy consumption in 2009 and 2010, showed substantial growth between 2010 and 2011. By contrast, the energy consumption of domestic aviation dropped by 3.9 % ([5]) in spite of an estimated growth of 10 % in passenger-kilometres between 2010 and 2011.

***Passenger-kilometres** show the development of the basic demand for passenger transport. A journey of one person over 100 kilometres yields 100 passenger-kilometres (pkm).*

Figure 7.2: Energy consumption of transport, by mode, EU-27
(index 2000 = 100)



NB: Not including international navigation, pipeline transportation, and unspecified.

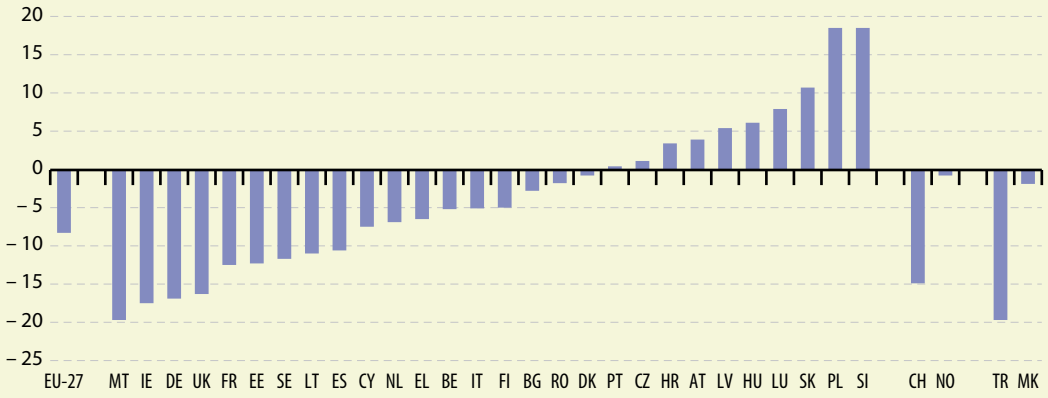
Source: Eurostat (online data code: tsdtr250)

How energy consumption of transport relative to GDP varies between Member States

The energy consumption of transport relative to GDP evolved very differently in the EU between 2000 and 2011. In general, the old Member States tended to show decreasing levels of energy consumption per unit of GDP between 2000 and 2011. In turn, the majority of countries with increasing energy consumption are Member States that display catching-up potentials regarding GDP per capita (values below EU-27 average). There are several possible reasons for this variation between Member States. First, specific resources are not endowed equally. Hence, the demand for mobility that has to be financed varies ([6]). Different endowments and spending options influence demand for both the quantity and quality of transport. Countries with a smaller transport budget may not be able to afford the most efficient technology, leading to higher energy consumption. Furthermore, infrastructure endowments as well as investments for new constructions or extensions vary between countries ([7]). All of these factors results in different transport levels.

([5]) European Commission, DG Transport and Mobility, *Statistical pocketbook 2013*, Table 2.3, data available online.
([6]) Eurostat, *Substantial cross-European differences in GDP per capita*, Statistics in Focus 47/2012.
([7]) OECD/International Transport Forum, *Spending on Transport Infrastructure 1995–2011, trends, policies, data*, May 2013, Paris.

Figure 7.3: Energy consumption of transport relative to GDP, by country
(% change 2000–2011)



NB: Change 2000–2010 for CH; Energy consumption of transport includes all modes of transport, with the exception of maritime and pipeline transport

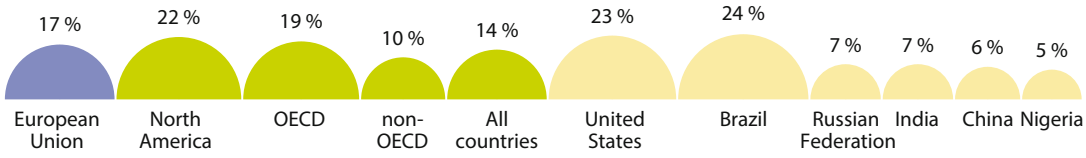
Source: Eurostat (online data codes: tsdtr100, tsdtr250 and nama_gdp_k)

EU energy consumption of transport compared with other countries in the world

A comparison of OECD and non-OECD countries shows that in 2008 energy consumption by transport was higher in OECD countries. However, the projections predict non-OECD countries will surpass OECD states by 2025 ([8]). This shows that energy consumption of transport is important, not only at EU-level, but also on a world-wide scale, especially for developing countries.

Data for the United States show the energy consumption of different transport modes is similar to that of the EU. In both the EU and the US, road transport is responsible for 82 % of the transport sector's energy consumption ([9]). Data for road sector energy consumption (relative to total energy consumption) can be compared for most countries. The EU shows a share of road sector energy consumption of 17 % which is less than the OECD average (19 %). The lowest shares of road transport energy are reported for Sub-Saharan Africa.

Figure 7.4: Global comparison of road sector energy consumption
(% of total energy consumption)



NB: Road sector energy consumption is the total energy used in the road sector including petroleum products, natural gas, electricity, and combustible renewable and waste. Total energy consumption is the total country energy consumption.

Source: World Bank

What lies beneath this indicator?

The mobility of people and goods requires energy. The total consumption of energy depends on the total amount of transport demand and on the mode of transport. Because energy consumption impacts on the environment, it is an aim of sustainable development to satisfy demand for mobility by using the lowest possible amounts of energy. Therefore the EU Sustainable Development Strategy (EU SDS) tackles both the total amount of transport energy used and efficient energy use.

Energy consumption of transport relative to GDP is calculated by dividing energy consumption of transport by GDP (chain-linked volumes, at 2005 exchange rates). Energy consumption includes all transport modes (road, rail, inland navigation, aviation), with the exception of maritime and pipeline transport.

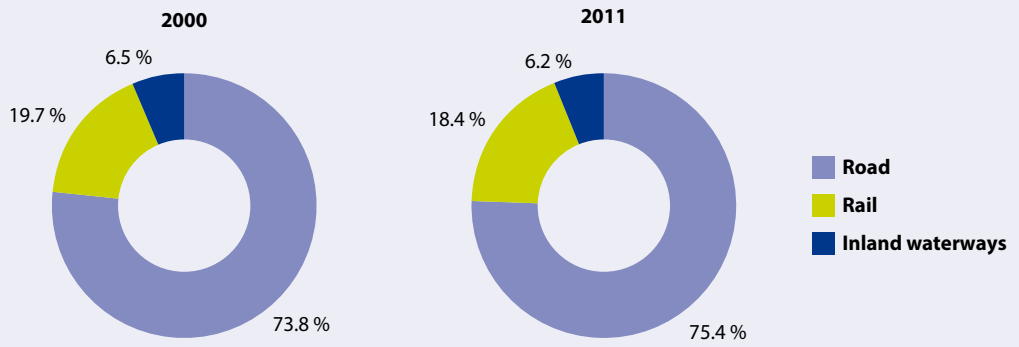
([8]) US Energy Information Agency, *International Energy Outlook* 2011.
([9]) US Department of Energy, *Transportation Energy Data Book*, Table 2.5, 2011.

Modal split of freight and passenger transport

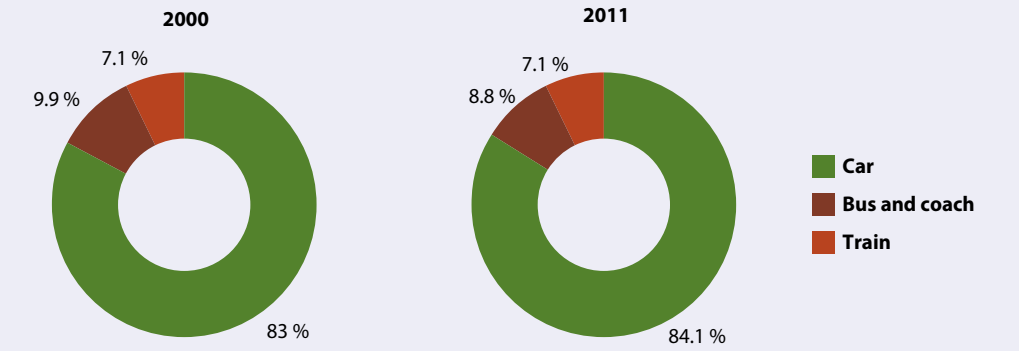
Moderate increase in the share of road and car in freight and passenger transport in the EU between 2000 and 2011. Thus, no substantial shift towards more environmentally friendly transport modes could be observed

Figure 7.5: Modal split of freight and passenger transport, EU-27

(a) Freight transport (% in total inland freight tonne-km)



(b) Passenger transport (% in total inland passenger-km)



NB: Data on passenger transport performance are collected on a voluntary basis. Some remaining gaps have been filled with estimates. Road transport data are not harmonised at the EU level (see Eurostat metadata on passenger transport). Road freight transport is based on all movements of vehicles registered in the reporting country, whereas rail and inland waterways transport are based on movements on national territory (see Eurostat metadata on freight transport).

Source: Eurostat (online data codes: tsdtr220 and tsdtr210)

No substantial shifts in freight and passenger transport

Regarding shares of different transport modes in total inland freight transport, no substantial change can be observed since 2000. In 2011, road transport covered 75.5 % of the almost 2 400 million tonne-kilometres performed in the EU, followed by rail with a share of 18.4 %, and inland waterways with a share of 6.2 %.

However, trends in the modal split of freight transport can be divided into two sub-periods. First, between 2000 and 2009 road transport steadily increased its share from 73.7 % to 77.5 %, while the share of rail transport and inland waterways declined. Then, in the aftermath of the economic crisis the situation started changing. Whereas road transport lost two percentage points between 2009 and 2011, rail increased its share from 16.6 % to 18.4 %. This latest development has returned the shares of transport modes to levels similar to those of 2000 ([10]).

Inland transport *includes all transport journeys within a specific country.*

([10]) See European Environment Agency, *The contribution of transport to air quality, TERM 2012: transport indicators tracking progress towards environmental targets in Europe*, EEA Report No 10/2012 (p. 28) for further analysis on this subject.

Regarding shares of different passenger transport modes, likewise, no substantial change can be observed since 2000. In 2011, 84.1 % of the more than 5 700 000 million passenger-kilometres in the EU are covered by passenger cars. On the other hand, public transport appears with a combined share in total transport movements of 15 % (buses and coaches covering 8.8 % and train 7.1 %).

Passenger-kilometre growth rates of the three transport modes covered have been declining since 2007, but only became negative in 2010 ([11]). Between 2007 and 2010 the modal split changed little: while train transport kept its share, there was some minor shift from buses to passenger cars. Thus, the financial crises had only a lagged influence on the amount of transport movements, and almost no influence on the shares for passenger cars, buses and trains. However, to assess a modal shift a longer time series should be analysed.

Except for air transport, passenger transport is not strongly affected by the crisis

Unlike freight transport, which was substantially affected by the crisis, demand for passenger transport — at least for trains, passenger cars, and buses and coaches — does not seem to be directly linked to the EU's economic performance. However, data on passenger air transport reveals air traffic is more immediately affected by the economic crisis. Passenger-kilometres of domestic air transport dropped by 2 % in 2008; followed by another decrease of 7 % in 2009 ([12]). Households often use air travel for leisure purposes. Their budgets tend to be more limited during a crisis with leisure spending being cut first. As a result, air transport demand is more volatile.

Is the 2009 turn-over in the modal split of freight transport sustainable?

Reasons for the turn-over in modal split of freight transport in 2009 can only be assumed. The economic crisis, which hit the transport sector severely, certainly challenged all market actors. The Marco Polo programme, which is the only EU funding instrument supporting actions in freight transport, could be another reason.

Box 7.1: The Marco Polo programme (2007–2013)

The second Marco Polo programme (2007–2013) was expected to shift a substantial part of the forecasted freight transport growth to more environmentally friendly transport modes. The involved projects have realised an actual modal shift of 19 500 million tonne-kilometres; the equivalent of one million truck trips with an average load of 20 tonnes of freight over a distance of 1 000 kilometres ([13]). However, this shift represents less than 1 % of total freight traffic.

Road transport sector hit hard by the crisis

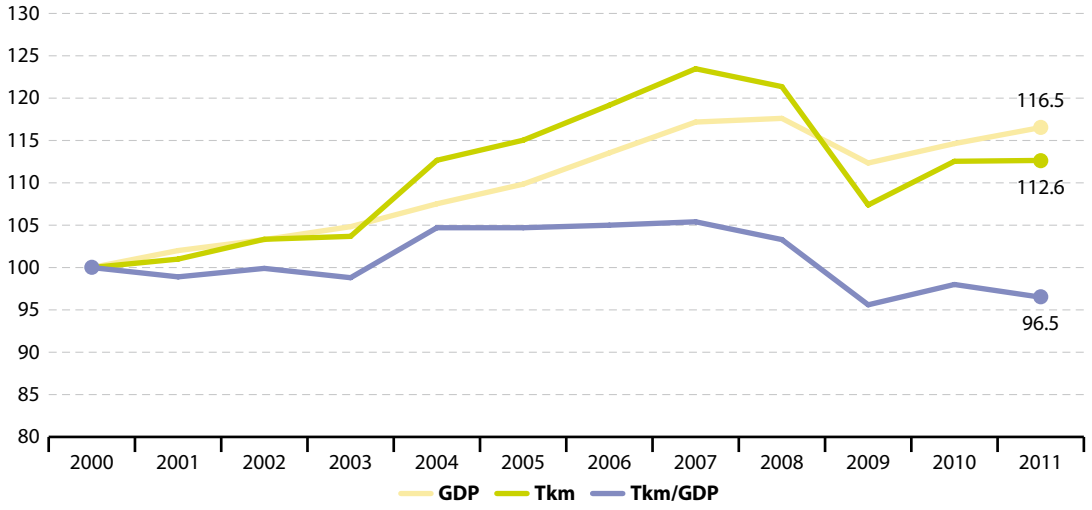
Globalisation combined with outsourcing of production sites is a main driver for freight transport capacities. Freight transport mainly occurs on roads in the EU. With three out of four tonne-kilometres covered by road transport, this sector has been particularly exposed to the economic crisis. It took just a year, from 2008 to 2009, to cancel out six years of growth in European road freight transport. Peaking in 2007, the performance of inland freight transport in the EU dropped by almost 13 % and reached the lowest level of tonne-kilometres in six years in 2009. This drop in freight transport holds for all regions of the EU. A slowdown in the construction and engineering sector, requiring less building and raw materials to be transported, in particular reduced freight transport. On the other hand, agriculture goods were only mildly affected by the crisis, and mail and parcels even shifted upwards. However, the effect of these two groups is rather small as quantities are relatively minor ([14]). Even by the end of 2011, no substantial recovery could be observed in the road freight industry ([15]).

([11]) European Commission, *EU transport in figures, statistical pocketbook 2012*, Luxembourg, 2012, p. 45–50.
([12]) European Commission, *EU transport in figures, statistical pocketbook 2013*, Luxembourg, 2013, p. 46.
([13]) European Commission, *The Marco Polo programme — Results and outlook*, COM(2013) 278 final, Brussels, 2013.
([14]) Eurostat, *Six years of road freight growth lost to the crisis*, Statistics in Focus, 12/2011.
([15]) Eurostat, *Decline in European road freight transport in 2011 reflecting the economic climate*, Statistics in Focus 38/2012.

Decoupling of freight transport from economic growth yet to be seen

Between 2000 and 2011 freight transport measured in tonne-kilometres increased by an average of 1.1 % per year. Although GDP increased even more in this period, the volume of freight transport relative to GDP did not decrease enough to produce a visible decoupling effect.

Figure 7.6: Volume of freight transport relative to GDP, EU-27
(index 2000 = 100)



Source: Eurostat (online data codes: tsdtr230 and nama_gdp_k)

One of the operational objectives of the EU Sustainable Development Strategy is 'decoupling economic growth and the demand for transport'. So far, this only happened during the economic recession. In periods of positive economic growth, volumes of freight transport have increased faster than GDP.

This trend is stable at EU-level; but it holds also for almost half of the Member States, where growth of tonne-kilometres of road transport (being by far the most used transport mode) outnumbers GDP growth ([16]). In 11 of these countries, GDP per capita is below the EU-average, indicating that larger road transport growth coincides with GDP catching up-effects. However, there are also Member States with higher GDP levels that show larger transport growth than GDP growth (for example, Germany, Sweden, and the United Kingdom).

Box 7.2: How transport prices have evolved

Prices play an important role in the context of transport. Demand for transport services declines as prices rise ([17]). Rising prices can have positive impacts on several environmental issues as transport demand and movements diminish. Changing relative prices between different transport modes can influence the shares of different transport modes. Then again, transport is crucial for people's quality of life with rising prices signifying a rather negative impact.

The Harmonised Indices of Consumer Prices (HICPs), a measure of consumer price inflation in the EU, increased by 33.9 % between 2000 and 2012. Compared to this, price indices for transport services all showed steeper increases. While rail and road transport services increased most (60.0 % and 63.1 % respectively), air transport prices grew by almost 50 % in 12 years. These price rises for transport services are very substantial in light of a modest 6.8 % increase in vehicle prices. These differences may be among the reasons why the share of buses, coaches and trains in the modal split of passenger transport has not risen.

([16]) European Commission, *EU transport in figures, statistical pocketbook 2012*, Luxembourg, 2012.
([17]) For an overview of transport elasticities and studies on this theme: Victoria Transport Policy Institute, *Understanding Transport Demands and Elasticities, How Prices and Other Factors Affect Travel Behaviour*, March 2013, Victoria (Canada).

What lies beneath these indicators?

Energy consumption and related environmental and health impacts vary substantially between different transport modes. Therefore, changes in the modal split of freight and passenger transport can have considerable effects on the impacts of transport.

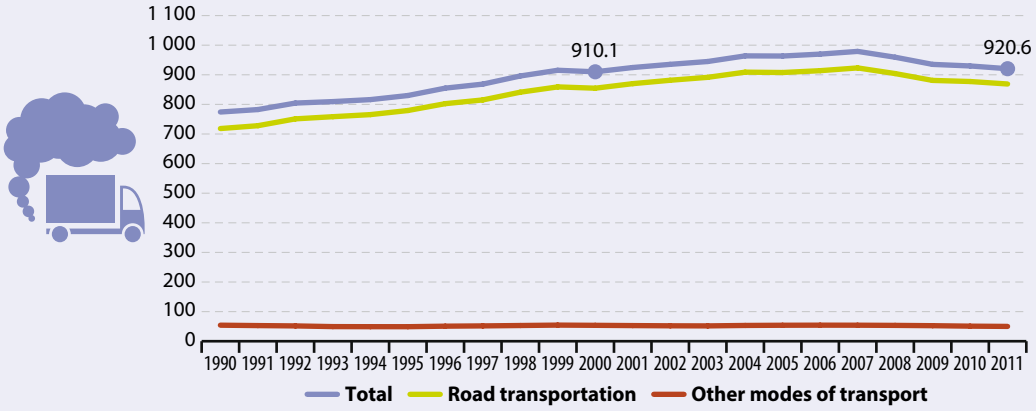
Modal split of freight transport indicates the percentage share of each transport mode in total inland transport. Transporting one tonne of goods over a kilometre corresponds to a tonne-kilometre (tkm). The indicator includes transport by road, rail and inland waterways. Air transport is not included. Volume of freight transport relative to GDP is calculated by diving tonne-kilometres by GDP.

Modal split of passenger transport indicates the percentage share of each transport mode in total inland transport. A journey of one person over a kilometre yields a passenger-kilometre (pkm). The indicator includes journeys by passenger cars, buses and coaches, and trains. Domestic air transport and human powered mobility (walking, cycling) are not yet included.

Greenhouse gas emissions from transport

1.1 % increase in greenhouse gas emissions from transport in the EU between 2000 and 2011. The post-2007 economic downturn played a major role in reducing GHG emissions

Figure 7.7: Greenhouse gas emissions from transport, EU-27
(million tonnes of CO_2 equivalent)



NB: GHG emissions from international aviation and navigation are not included.

Source: European Environment Agency (online data code: tsdtr410)

Transport is responsible for about a quarter of EU greenhouse gas (GHG) emissions. Emissions from this sector increased by 26 % between 1990 and 2007. This compares with a fall in many other sectors. For example, energy sector GHG emissions fell by 14 % and agricultural emissions by 20 % over the same period ([18]).

Since 2000, growth in transport GHG emissions has shown signs of slowing: while emissions grew by 17.5 % during the 1990s, they only rose by 1.1 % between 2000 and 2011. However, the decline is ultimately a result of the economic downturn, reflected in falling transport GHG emissions after a 2007 peak. Thus growth rates from 2000 to 2007 were 7.6 %, whereas afterwards emissions fell by 6.0 % up to 2011.

Transport GHGs: *the relevant gases in the context of transport are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O).*

Road transport is the most responsible for transport GHG but...

The main driver behind this development is road transport, responsible for more than 94 % of transport GHG emissions. Other transport modes that are included (rail, inland navigation and domestic aviation) already showed some declining tendencies at the start of the 2000s. Finally, another large source of emissions — international navigation and aviation — is not included.

...it also plays a positive role in the decline of other transport emissions

Between 2000 and 2011, emissions of nitrogen oxides (NO_X) and of particulate matter (PM) from transport decreased by 23 % and 17 % respectively or further details see the 'sustainable consumption and production' chapter. These improvements are mainly due to progress in road transport with the latter showing by far the largest shares of total NO_X and PM emissions from transport.

EU sets clear GHG emission reduction targets in the transport sector

The Europe 2020 strategy sets a clear target to cut GHG emissions by 20 % compared to 1990 levels. This could be increased to even 30 % if conditions are right, namely an international agreement on reduction goals.

To achieve this goal, the transport sector needs to reduce GHG emissions by at least 60 % by 2050 with respect to 1990.

([18]) Eurostat, Pocketbooks 2012 edition, *Energy, transport and environment indicators,* 2012, Luxembourg.

Box 7.3: The Transport White Paper of the EU

In 2011, the European Commission adopted the new Transport White Paper. This roadmap envisions a Single European Transport Area with no barriers between transport modes and national systems. Transport will depend less on oil. The transport system should allow for transport growth and support mobility while substantially reducing greenhouse gas emissions. Ten goals are listed to achieve the 60 % reduction target by 2050. The key goals are:

- No more conventionally fuelled cars in cities.
- 40 % use of sustainable low-carbon fuels in aviation; at least a 40 % cut in shipping emissions.
- A 50 % shift of medium distance intercity passenger and freight journeys from road to rail and waterborne transport.

Further, these goals will contribute to the stated reduction goal for the transport sector of at least 60 % of GHGs by 2050 with respect to the 1990 level. As a first step, GHGs will be cut by around 20 % with respect to their 2008 level by 2030.

One of the several initiatives that are formulated in the White Paper concerns the core network of strategic European infrastructure, which is consistent with the Trans-European transport network (TEN-T) ([19]). An agreement on proposals to transform the existing infrastructure patchwork has been signed this year between the Commission, the Council and the Parliament ([20]). One of its goals is investment in transport infrastructure to contribute to the transport sector's greenhouse gas emissions reduction target.

Box 7.4: Other EU policies to reduce CO_2 emissions of transport ([21])

In 2009, a regulation on CO_2 emission standards for new cars entered into force ([22]). Average CO_2 emissions from new passenger cars have fallen since. In 2007, new cars emitted on average 158.7 grams of CO_2 per kilometre. This rate diminished steadily to 132.2 grams of CO_2 in 2012.

In April 2013, the European Commission published a proposal to reduce fuel consumption and thus GHG emissions by developing more aerodynamic lorries ([23]). The proposal addresses several targets set in the Transport White Paper. As well as better environmental performance, the new front cabin design should be less dangerous for pedestrians and cyclists in case of accidents and will enlarge drivers' field of vision. Effects can also be named for hauliers which save fuel costs and for the industry, especially vehicle manufacturers. The new trucks will be expected on roads by 2018–2020 as the proposal has yet to be adopted by the European Parliament and Member States ([24]).

What lies beneath this indicator?

The accumulation of greenhouse gases in the atmosphere may have negative impacts on the climate and interrelated processes (such as biodiversity and soil erosion). In the EU transport is the second biggest emitting sector. Further, transport is the only category that emits more greenhouse gases than it did in 1990. Hence, reducing greenhouse gas emissions from transport is an important issue for the EU in achieving its 2020 reduction targets.

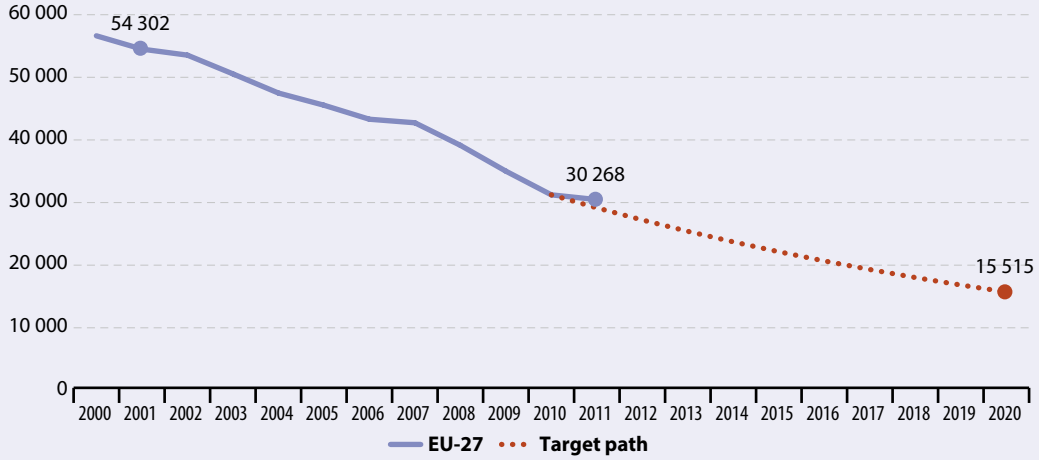
The indicator shows trends in the emissions from transport of greenhouse gases regulated by the Kyoto Protocol. Included are emissions from road transport, rail, inland navigation and domestic aviation. The relevant gases in the context of transport are aggregated to tonnes of CO_2 equivalent according to their relative global warming potential.

([19]) European Commission, *Proposal for a regulation for the European Parliament and of the council on Union guidelines for the development of the trans-European transport network*, COM(2011) 650 final, Brussels, 2011.
([20]) Commissioner for Transport, *The Commission welcomes 'historic' agreement on new trans-European transport network*, press release, May 2013.
([21]) Another project, funded by the European Commission's Directorate General for Climate Action, was "Routes to 2050". The project focussed on possible GHG emission reduction goals and policy frameworks required to meet these goals. The results bring an enhanced understanding of the wider potential impacts of transport GHG reduction policies.
([22]) Regulation (EC) No 443/2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles.
([23]) European Commission, *New EU rules for safer and more environmental lorries*, press release, April 2013.
([24]) European Commission, *Proposal for a Directive of the European Parliament and of the Council amending Directive 96/53/EC of 25 July 1996 laying down for certain road vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic*, COM(2013) 195 final, Brussels.

People killed in road accidents

44.3 % drop in the number of people killed in road accidents in the EU between 2001 and 2011. This is close to the path towards reaching the 50 % reduction goal by 2020

Figure 7.8: People killed in road accidents, EU-27
(number of killed people)



Source: EU Commission, DG for Mobility and Transport — CARE database (online data code: tsdtr420) and Statistical Pocketbook 2013

More than 30 000 people were killed in road accidents in the EU in 2011. This loss is equivalent to the size of a medium town. However, compared with 54 000 fatalities in 2001, substantial progress has been achieved with a yearly reduction rate of 5.7 %.

Despite this marked improvement, the ambitious goal set in the European Road Safety Action Programme 2001–2010, to halve fatalities between 2001 and 2010, was not met. The renewal of the Action Programme will nevertheless continue efforts to reduce road fatalities and improve safety. The new objectives are also in line with the goal formulated in the Transport White Paper to reduce fatalities to close to zero by 2050 ([25]).

Box 7.5: European Road Safety Action Programme 2011–2020

The European Road Safety Action Programme sets the challenging goal of halving the number of road deaths in Europe between 2011 and 2020 ([26]). This means efforts already undertaken in the 2001–2011 Action Programme will need to continue.

The programme provides a general governance framework to guide national or local strategies. Seven objectives, for which action at EU and national level will be proposed, have been set:

- Improve education and training of road users
- Increase enforcement of road rules
- Safer road infrastructure
- Safer vehicles
- Promote the use of modern technology to increase road safety
- Improve emergency and post-injuries services
- Protect vulnerable road users.

Recent key initiatives in these areas include a new EU Driving Licence impeding the access of young people to powerful motorbikes ([27]), exchanges of best practice concerning enforcement plans, cross-border enforcement rules and first milestones on the way to an injury strategy ([28]).

([25]) European Commission, White Paper, *Roadmap to a Single European Transport Area — Towards a competitive and resource efficient transport system*, COM(2011) 144 final, Brussels.
([26]) European Commission, *Towards a European road safety area: policy orientations on road safety 2011–2020*, COM(2010) 389 final, July 2010.
([27]) Directive 2012/36/EU on driving licences.
([28]) See http://ec.europa.eu/transport/road_safety/topics/serious_injuries/index_en.htm.

EU fighting the four key offences on the road with several initiatives

Four key offences are responsible for 75 % of fatal road accidents in the EU: speeding, running a red light, drink driving and not wearing a safety belt ([29]). In the context of the European Road Safety Action Programme numerous initiatives on these issues were realised. The most successful seem to be passive safety devices for vehicles such as seatbelts and airbags ([30]). This is confirmed by international data showing that the largest reduction of road deaths has been attained among car occupants ([31]).

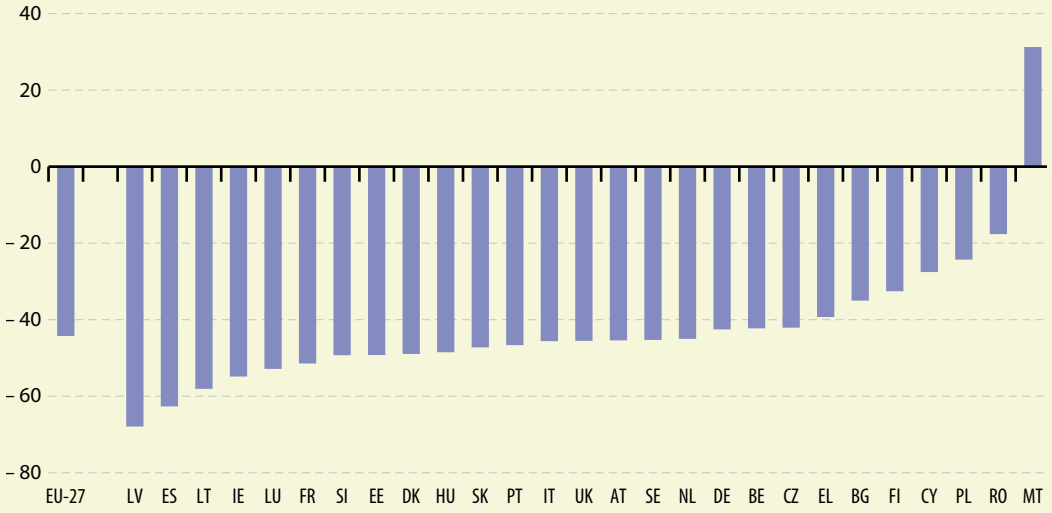
Drivers and passengers of vehicles account for almost 80 % of people killed in road accidents; the remaining 20 % are pedestrians. Four out of five drivers or passengers killed in road accidents were in a car or on a motorcycle. A share above the effective transport performance is seen for pedal cyclists with 9 %. Non-motorised traffic participants (pedestrians, pedal cyclists) are therefore among the most affected as they make up almost 30 % of all victims of fatal accidents.

How the number of people killed by road accidents varies between Member States

The majority of Member States still have to further strengthen their efforts to meet the EU's goal of halving road fatalities at the national level.

The highest relative reduction of road fatalities was observed in Latvia between 2001 and 2011. The only registered increase was in Malta, which has very few road fatalities, from 16 to 21. With 51 road fatalities per million inhabitants Malta is among the safest Member States. This ranking could further be calculated by taking into account the amount of registered passenger cars in a country or the transport performance (measured in passenger-kilometres). Summarising results from these three approaches indicate that road safety is highest in the Netherlands, Sweden and the UK.

Figure 7.9: People killed in road accidents, by country
(% change from 2001 to 2011)



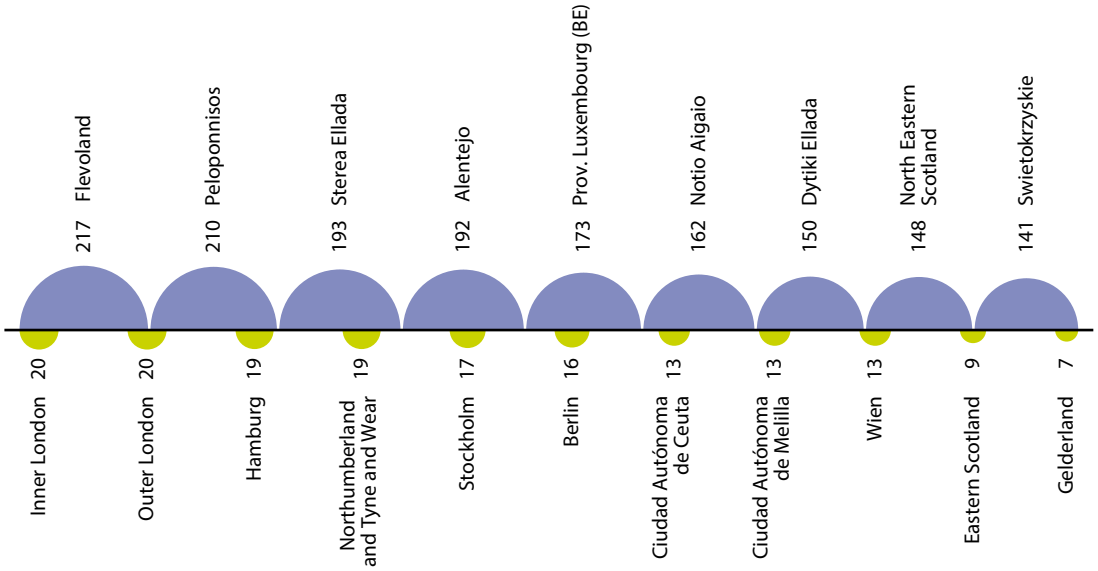
Source: EU Commission, DG for Mobility and Transport — CARE database (online data code: tsdtr420) and Statistical Pocketbook 2013

([29]) European Commission, *20 years of the single market, 20 achievements in transport*, Publications Office of the European Union, Luxembourg, 2013.
([30]) European Commission, *Road Safety Programme 2011–2020: detailed measures*, MEMO/10/343, July 2010, Brussels.
([31]) OECD, International Transport Forum, *Road Safety Annual Report 2013*, IRTAD Annual Report 2013, Paris.

Road fatalities considered at a regional level

A look at the regional data for EU Member States reveals large differences, not only in absolute figures but also when relating them to the inhabitants of the respective regions. Among the ten regions with the highest number of people killed in road accidents per million inhabitants, five are in Greece. On the other hand, as the top 10 regions reveal, road traffic is especially safe in urban regions (for example London, Hamburg, Stockholm, Berlin and Wien). This might be due to relatively higher shares of public transport. High traffic densities in urban areas may be another reason because they reduce speeds.

Figure 7.10: Victims in road accidents in 2011, top and bottom 10, by NUTS 2 regions
(number of people killed per million inhabitants)



NB: 2009 data for Peloponnisos, Sterea Ellada, Notio Aigaio, Dytiki Ellada.

Source: Eurostat (online data code: tran_r_acci)

Road fatalities compared with other countries in the world

On a worldwide scale fatalities due to road accidents differ widely between countries. Road safety performances measured in fatalities per 100 000 population, for example, vary more than nine fold between members of the International Road Traffic Accident Database (IRTAD) ([32]). Road transport shows the highest fatality rates in South Africa and Malaysia. However, almost all countries display decreasing fatalities in the most recent periods. 2012 will most probably show the lowest fatalities for most member countries of the IRTAD ([33]).

What lies beneath this indicator?

Fatalities due to road accidents is an important indicator of road safety.

People killed in road accidents shows the numbers of fatalities in road transport. It includes drivers and passengers of motorised vehicles as well as pedestrians. Fatalities embrace all people being killed within 30 days from the day of the accident.

([32]) The International Traffic Safety Data and Analysis Group (IRTAD) was established by the OECD Road Transport Research Programme to provide aggregated data on a continuous basis.
([33]) OECD, *International Transport Forum, Road Safety Annual Report 2013*, IRTAD Annual Report 2013, Paris.

8

Natural resources

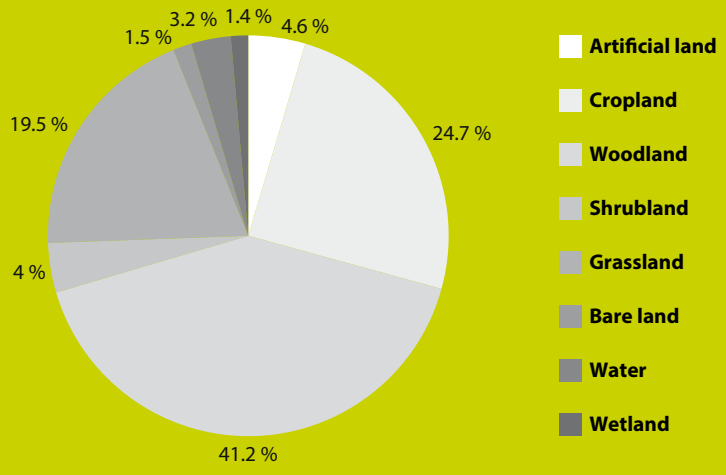
Natural resources seen through the lens of the Green Economy

More than 40 % of the EU is covered by woodland

Land cover refers to the bio-physical coverage of land. Forests and other wooded areas occupied 41.2 % of the total area of the EU in 2012, cropland nearly a quarter (24.7 %) of the area and grassland almost one fifth (19.5 %), while built-up and other artificial areas, such as roads and railways, accounted for 4.6 % of the total area.

Woodland is the prevailing land cover in northern parts of Europe and for a number of countries whose typography is dominated by mountains and hilly areas. Woodland covered more than half of the total area in Sweden (75.6 %), Finland (71.8 %), Estonia (60.6 %), Slovenia (60.2 %) and Latvia (55.5 %). At the other end of the scale, forests and other wooded areas were most scarce in the United Kingdom (19.8 %), Denmark (18.3 %), Ireland (13.2 %), the Netherlands (12.6 %) and Malta (5.1 %).

Land cover overview, EU-27, 2012
(% of total area)



Source: Eurostat (online data code: lan_lcv_ovw)

SUSTAINABLE DEVELOPMENT INDICATORS

Overview of main changes

Despite some improvements, the EU's natural resources are under continuous pressure. Ecosystems and their services, which are the backbone of biodiversity and human well-being, are increasingly threatened by land take for settlements and infrastructure as well as intensification of agricultural production. Some progress can be observed in marine resources. Yet it should be interpreted cautiously because a reduction in the size of the EU fishing fleet has not yet led to a meaningful recovery of fish stocks. Further reforms of and new concepts within agriculture, fish and water policies, as well as in transport and consumption and production, will be needed to put use of natural resources in the EU on a sustainable path.

Ecosystem services are the range of benefits provided to humans by healthy ecosystems. Services include provisioning (such as food and wood), regulating (for example climate, flood and water regulation) and cultural services (for example, spiritual, recreation, educational).

Table 8.1: Evaluation of changes in the natural resources theme (EU-27, from 2000) (1)

Level 1	Level 2	Level 3
	Marine resources	
Common bird index	: Fishing capacity (*)	
	Fresh water resources	
	: Surface and ground water abstraction	
Conservation of fish stocks	**Land use**	
	: Built-up areas	

(*) From 2007

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.

Natural resources seen through the lens of Quality of Life

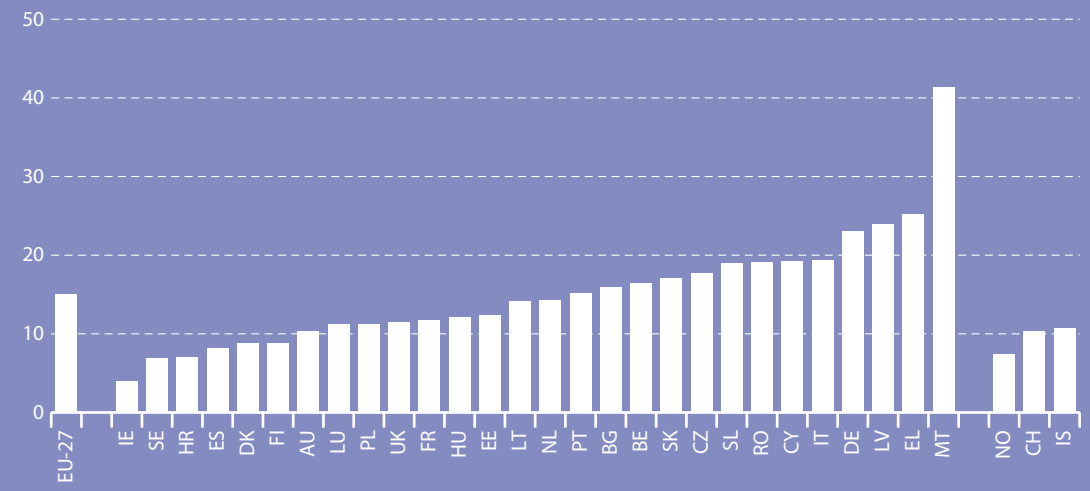
Less Europeans express concerns with the environmental quality of their residential areas

Living conditions and housing quality are important determinants of human well-being. However, housing quality does not only depend on the quality of the dwelling itself, but also on the wider residential area. In particular, problems such as noise, pollution and environmental degradation can have direct negative consequences on the perceived quality of a residential area.

In recent years the reported overall exposure of the European population to pollution, grime or other environmental problems has seen a sizeable decline, from 17.6 % in 2005 to 14.1 % in 2012.

The population in different parts of Europe is unevenly exposed to environmental issues. At one extreme, in 2011 over 40 % of the population in Malta perceived the area in which they lived as being affected by pollution, grime or other environmental problems. In contrast, the proportion of residents suffering from these problems was considerably smaller in Ireland (4.0 %), Sweden (6.9 %) and Croatia (7.0 %).

Pollution, grime or other environmental problems, by country, 2011
(% of population)



Source: Eurostat (online data code: ilc_mddw02)

Why do we deal with natural resources?

Human well-being relies on natural capital, including the ability of ecosystems to provide food, water and fuel as well as to regulate the environment through services such as carbon storage, flood control and water purification. Given that natural systems can only tolerate disruption up to a certain point ([2]), the sustainable use of natural resources and maintenance of well-functioning ecosystems is crucial to meeting the demands of current and future generations. Their protection and strategic use are therefore an integral part of sustainable development.

Some progress has been made in the usage of water and air, but human activities continue to threaten vast areas of natural land and the life contained within. Recent assessments present a distressing picture about the status of biodiversity and ecosystems and highlight the lack of progress in achieving European targets in this area ([3]).

A key factor behind biodiversity decline is changes in land use and land cover due to growing human demands for food, renewable energy and infrastructure ([4]). Continuing efforts to satisfy these demands have resulted in the loss and fragmentation of vast areas of natural and semi-natural habitats. Such habitat modifications not only threaten biodiversity, but also reduce the resilience of ecosystems to foreseen climate change effects such as an increase in the frequency of natural disasters ([5]).

Several important linkages exist between the natural resources theme and other areas of sustainable development. While exploitation and consumption of natural resources have provided economic growth and improved human welfare in Europe to date, their diminishing quantities and quality can ultimately threaten livelihoods. Over-fishing, for example, has significantly decreased fish stocks and landings and affected both the resilience of the marine ecosystems and the incomes and employment opportunities within the fishery sector. Water shortages generated by over-abstraction and an increasing number of groundwater aquifers that do not meet EU drinking water standards water present further economic repercussions for society. Land availability and land use change, for example, are recognised as having a significant social dimension, related to issues surrounding tenure rights, access to land and land displacements. Trade-offs between nature protection goals and other sectors, such as energy and food production, transport and infrastructure development, are frequent. They require an awareness of not only European needs, but also the impact of land use decisions and consumption patterns on other world regions. The reliance of many of the world's poor on natural resources also highlights the need to think about the environment and sustainable development in global terms.

Thus, only if EU production and consumption habits accept the physical limits of the biosphere and ecosystems and their services, could a transformation to a green economy be achieved, resulting in an overall increase in human well-being.

([2]) This is often referred to as a threshold, tipping point or point of no return.
([3]) See COM 2012, BirdLife 2012, CBD 2010, EEA 2010 in the 'Further reading' box.
([4]) BISE: http://biodiversity.europa.eu/topics/land-use-changes
([5]) GRID-Arendal (2013), *Impacts on biodiversity and ecosystem from conventional expansion of food production*.

How does the EU tackle natural resources?

The EU Sustainable Development Strategy (EU SDS) dedicates one of its seven key challenges to natural resources. This has the overall objective to 'improve management and avoid overexploitation of natural resources, recognising the value of ecosystem services'.

The EU SDS operational objectives and targets are:

- Improved resource efficiency to reduce the overall use of non-renewable natural resources and the related environmental impacts of raw material use [considered in the chapter on sustainable consumption and production], thereby using renewable natural resources at a rate that does not exceed their regeneration capacity.
- Improved management and avoidance of overexploitation of renewable natural resources such as fisheries, biodiversity, water, air, soil and atmosphere, restoring degraded marine ecosystems by 2015 in line with the Johannesburg Plan (2002) including achievement of the Maximum Yield in Fisheries by 2015.

Other relevant EU policies and strategies for natural resources include the:

- **Common Agricultural Policy**, one of the most influential EU policies regarding biodiversity and has recently been reformed to meet the challenges of soil and water quality, biodiversity and climate change and to promote environmentally friendly farming practices (expected to be in place as from 1 January 2014).
- **EU Biodiversity Strategy to 2020**, including six main targets to halt the loss of biodiversity and ecosystem services in the EU by 2020.
- **EU Green Infrastructure Strategy** addressing Target 2 of the EU 2020 Biodiversity Strategy. This aims to maintain and enhance ecosystems and their services via the establishment of green infrastructure (GI) and restoration of degraded ecosystems.
- **EU Adaptation Strategy**, highlighting the value of ecosystem-based approaches, including their multiple benefits, such as reduced flood risk, soil erosion and heat island effects, and improved water and air quality.
- **Common Fisheries Policy** is currently undergoing reform to be more sustainable, contribute to the Europe 2020 strategy and work towards robust economic performance of the industry, inclusive growth and enhanced cohesion in coastal regions.
- **Resource Efficiency Roadmap**, recognising the direct and indirect impacts of EU policies on land use and aiming to achieve no net land take by 2050, as well as reducing pressure on natural resources via the fully delivering EU environmental legislation by 2020.

Further reading on natural resources

European Commission, *Green Infrastructure (GI): Enhancing Europe's Natural Capital,* COM(2013) 249 final.

European Bird Census Council 2012, *Trends of common birds in Europe,* 2012 update.

BirdLife 2012, *On the road to recovery? BirdLife assessment of progress on the EU 2020 Biodiversity Strategy.* October 2012.

Commission Communication, *Our life insurance, our natural capital: an EU biodiversity strategy to 2020,* COM(2011) 244.

European Commission, *Facts and figures on the Common Fisheries Policy — 2010 Edition*, Luxembourg, Office for Official Publications of the European Union, 2010.

European Environment Agency, *Assessing biodiversity in Europe — the 2010 report,* EEA report No 5/2010, Luxembourg, Office for Official Publications of the European Union, 2010.

European Environment Agency, *EU 2010 Biodiversity Baseline*, EEA Technical report No 12/2010, Luxembourg, Office for Official Publications of the European Union, 2010.

Eurostat news release 145/2010, *Land Use/Cover Area frame Survey: Results on EU land cover and use,* published for the first time, 4 October 2010.

Eurostat Statistics in Focus — 21/2011 Diversified landscape structure in the EU Member States.

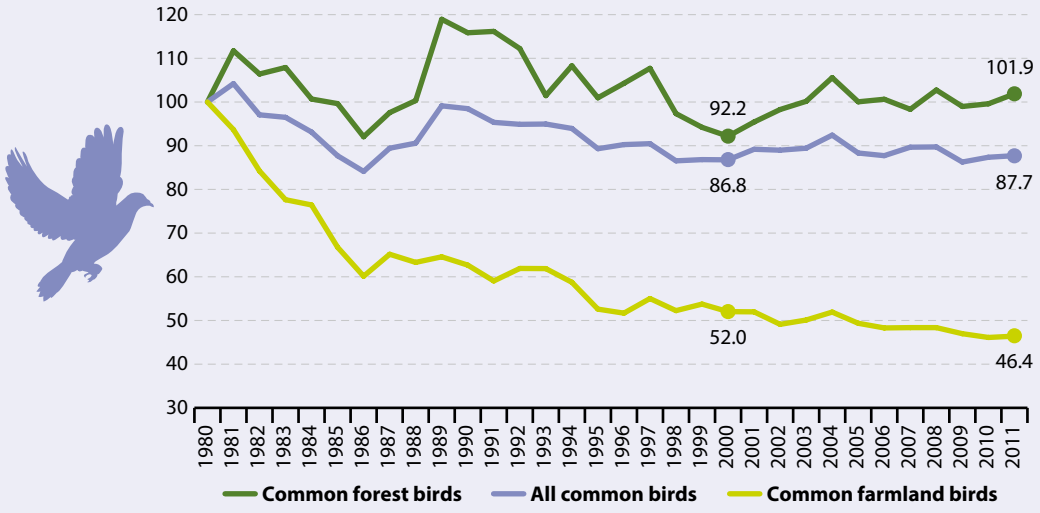
European Commission Conference on Land quality and land use information in the European Union — Keszthely (HU) 2011 — *Land cover and land use diversity indicators in LUCAS 2009 data.*

The Economics of Ecosystems and Biodiversity (TEEB) reports.

Abundance of common birds

1.1 % increase in the EU index for all common birds between 2000 and 2011. While forest birds showed an even stronger recovery, farmland birds declined further, reaching a record low in 2011

Figure 8.1: Index of all common, common farmland and common forest birds, EU
(Index 1980 = 100)



Source: Pan-European Common Bird Monitoring Scheme, Eurostat (online data code: tsdnr100)

The index of all common birds ([6]) remained relatively stable, increasing by an average of only 0.1 % annually between 2000 and 2011. A slight increase from 2009 to 2011 has returned the common bird index to a value of 87.7, putting it 0.9 percentage points above the 2000 value. Between 1990 and 2000, the index showed a steep average decline of 1.2 % per year (between 1990 and 2000).

Behind the relatively stable common bird trends lie more polarised trends in the populations of common farmland and forest birds. While forest birds increased by 9.7 percentage points between 2000 and 2011, farmland birds continued to decrease dramatically and reached an all-time low in 2010. Between 1990 and 2000, the farmland bird index declined by about 1.4 % per year on average. The index dropped by 5.6 percentage points between 2000 and 2011. Some of the species that declined the most over the past three decades include familiar farmland birds such as the grey partridge *Perdix perdix* (– 82 %), skylark *Alauda arvensis* (– 46 %), linnet *Carduelis cannabina* (– 62 %) and corn bunting *Miliaria calandra* (– 66 %) ([7]), all of which have a 'least concerned' status on the IUCN Red List, version 3.1 ([8]).

The index includes common forest and farm bird species. Forest species include hazel grouse, marsh tit, Eurasian jay, black woodpecker, and hawfinch, while farm species encompass yellowhammer, common kestrel, barn swallow, northern lapwing, common starling and Eurasian turtle dove.

Farmland bird diversity in the EU: still in decline

A strong discrepancy exists between relatively stable common bird population numbers and a significantly declining farmland bird trend. 'All common birds' include species from different habitats, including the increasing forest populations, among which habitat generalists are well represented. The trend therefore shows that bird species that are more dedicated to specific habitats are increasingly under threat in the EU.

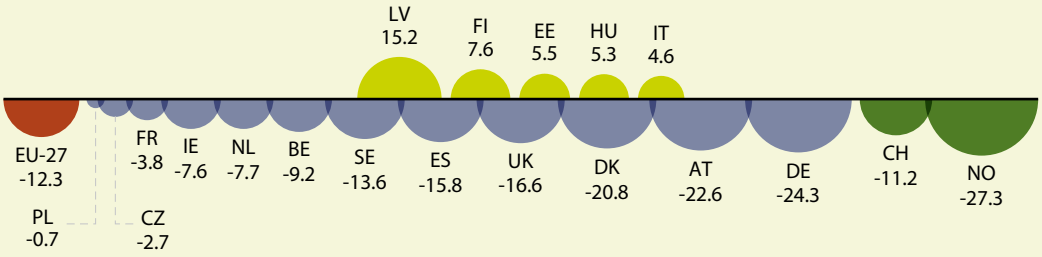
([6]) The EU aggregate figure is an estimate based on the following 18 Member States: United Kingdom, Sweden, Denmark, Czech Republic, Finland, France, the Netherlands, Germany, Belgium, Latvia, Spain, Austria, Ireland, Hungary, Italy, Poland, Estonia and Portugal. For the other Member States, no data is available. In the 1980s there were even fewer countries represented by the index. Thus, those declines in the bird index only refer to less than 18 countries.
([7]) All declines are between 1980 and 2010; more information can be found at http://www.ebcc.info/index.php?ID=470
([8]) The International Union for Conservation of Nature (IUCN) Red List Categories and Criteria are a system for classifying species at high risk of global extinction. The general aim of the system is to provide an explicit, objective framework for the classification of the broadest range of species according to their extinction risk.

Ongoing land use changes and increasing land take by human activities seem to have less harmful impacts on less specialised bird species. As a result, a continuation of current land use practices would inevitably lead to a further narrowing of bird species occurrences to those less vulnerable to human activities.

How the abundance of farmland birds varies between Member States

The common farmland bird index has declined in many of the 18 Member States for which data are available ([9]). This is seen most strongly in the old Member States (EU-15). Norway, Germany, Austria and Denmark showed the highest annual average rates of decline, while Latvia, Finland, Estonia, Hungary and Italy showed the most positive trends. Compared with their 2000–2007 averages, Hungary, Poland and the Czech Republic showed improvements in 2008.

Figure 8.2: Farmland bird index, by country
(% change over the period 2000–2008)



NB: EU-27: change over 2000-2010, EE: change over 2000-2006; IT: change over 2000-2007; EU-27 aggregate based on data from 18 Member States

Source: Eurostat (online data code: tsdnr100)

Habitats are the unique ecological areas in which particular animals, plants or other organisms live.

Declines in farmland bird populations mainly driven by agricultural changes

Recent evidence indicates that changes in agricultural methods, intensification and specialisation are largely responsible for farmland bird declines in Northern and Western Europe ([10]). According to one study, some species such as the ruff (*Philomachus pugnax*) may have changed their migratory route when flying north to their breeding grounds in Northern Europe and to Asia from Africa because of a reduction in their food supply due to intensive agriculture — in this case especially in the Netherlands ([11]). The study concludes that although ruffs appear to be able to shift migratory routes, environmental changes, such as habitat degradation and loss, can seriously affect other migrant bird populations.

Several factors have been cited as being particularly harmful in terms of agricultural intensification in the EU: hedgerow loss, land drainage, increased mechanisation, increased fertiliser and pesticide use, reduced spring cultivation, simplification of crop rotations, changes in crop use, and loss of farm diversity ([12]). These changes are linked to the EU's Common Agriculture Policy, which has been cited as providing harmful subsidies and failing to promote sufficient incentives for maintaining High Nature Value farmland and therewith the practices sustaining farmland biodiversity ([13]). High Nature Value farmland refers to areas which are predominantly agricultural and support high levels of species and habitat diversity and/or species of conservation concern.

([9]) The EU aggregate figure is an estimate based on 18 Member States; the following MS were not included in the figure: Bulgaria, Greece, Cyprus, Lithuania, Luxembourg, Malta, Romania, Slovenia and Slovakia. Monitoring data are either lacking, fragmented or of low quality.
([10]) BirdLife International (2013), *Europe-wide monitoring schemes highlight declines in widespread farmland birds*. Presented as part of the BirdLife State of the world's birds website. Available from: www.birdlife.org/datazone/sowb/casestudy/62. Checked: 08/08/2013
([11]) Verkuil, Y.I., Karlionova, N., Rakhimberdiev, E.N. et al 2012) *Losing a staging area: Eastward redistribution of Afro-Eurasian ruffs is associated with deteriorating fuelling conditions along the western flyway*. Biological Conservation. 149: 51–59.
([12]) BirdLife International (nd), *Common bird indicators: helping to track progress towards the 2010 target*.
([13]) BirdLife International (2012), *On the road to recovery? BirdLife assessment of progress on the EU 2020 Biodiversity Strategy*, October 2012

Bioenergy production also plays a role in the decline in farmland birds

Furthermore, rising demand for biomass for bioenergy production has led to a significant increase in cultivation of high-input crops such as corn and rape, which has resulted in additional threats to biodiversity and ecosystem functions. Consequently, fallow land, which is an important habitat for many farmland species, has been increasingly used to grow energy crops.

Box 8.1: Green infrastructure — a new tool for meeting EU biodiversity targets?

After failing to halt biodiversity loss by 2010 (as set out in the EU's 2001 goal ([14])), the EU Biodiversity Strategy to 2020 has set new targets and actions to address these negative trends. The headline target aims to halt the loss of biodiversity and degradation of ecosystem services in the EU by 2020 and restore them in as far as feasible, while increasing the EU's contribution to averting global biodiversity loss. Under Target 2 of the strategy, green infrastructure (GI) — which is comprised of spatially or functionally connected areas, such as protected areas — has emerged as a central tool for:

- Contributing to the full implementation of the Birds and Habitats Directive.
- Maintaining and enhancing biodiversity in the marine environment and wider countryside ([15]).
- Maintaining ecological coherence and thereby healthy ecosystems ([16]).
- Contributing to a green economy by providing job opportunities and increasing local GDP.
- Cost-effectively addressing the aforementioned threats within Europe as an alternative to grey infrastructure, benefiting both society and nature.

EU trends in common bird levels compared with other countries in the world

Similar to declines in European farmland birds, populations of many common grassland and shrubland birds have also shrunk in North America, apparently in response to the intensification of agricultural practices. An analysis of state-level Breeding Bird Survey (BBS) data highlighted that 15 of 25 bird species (60 %) breeding in grassland habitats declined on average by 1.1 % per year over the period 1980–1999 ([17]). Common birds are also increasingly under pressure in North America. Another analysis highlighted the plight of 20 common bird species, all of which have lost more than half of their continental population since 1967 ([18]).

What lies beneath this indicator?

Birds are considered good proxies for the overall status of biodiversity. They reflect environmental changes in ecosystems rather rapidly because they are at, or close to, the top of the food chain.

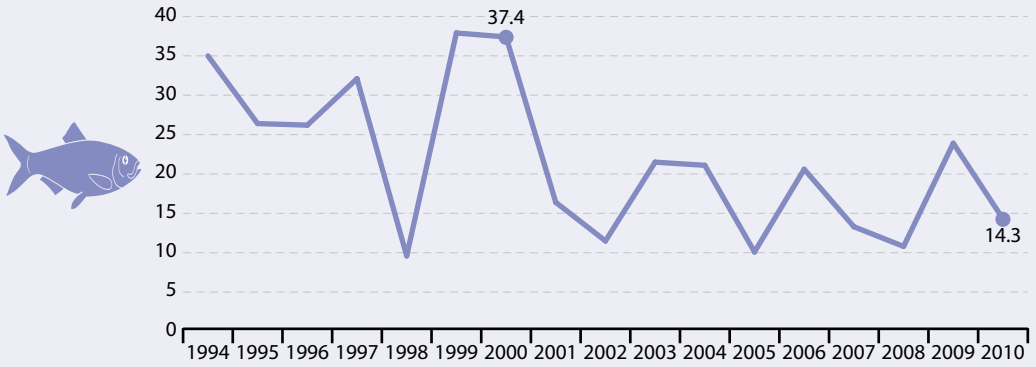
The common bird index combines information on population abundance and diversity of a selection of bird species associated with specific habitats and includes common forest and agricultural birds. An increase in the indicator means there are more species whose populations have increased than there are species with decreasing populations. For the accuracy of the index it has to be noted, that from 1980 to 2011 new species and new Member States were included in the index which might, to some extent, distort the trend analysis.

([14]) Presidency Conclusions, Göteborg European Council, 15 & 16 June 2001. SN 200/1/01 REV 1.
([15]) http://ec.europa.eu/environment/nature/ecosystems/index_en.htm
([16]) BISE: http://biodiversity.europa.eu/bise/topics/green-infrastructure
([17]) For further information see BirdLife (State of the world's birds): http://www.birdlife.org/datazone/sowb.
([18]) Most of the world's countries lack the extensive, long-term monitoring schemes found in Europe and North-America. This is why figures on the global scale are rather ambiguous.

Conservation of fish stocks

14.3 % of the total EU fish catches in 2010 were from stocks outside safe biological limits. Catches of non-industrial fish exceeded sustainable levels of exploitation

Figure 8.3: Fish catches from stocks outside safe biological limits: status of fish stocks managed by the EU in the North-East Atlantic, total catches
(%)



NB: EU-managed waters of the North-East Atlantic only (North Sea, Baltic Sea, Bay of Biscay and the Iberian Peninsula) and excluding the Mediterranean Sea and the Black Sea

Source: European Commission services, ICES (online data code: tsdnr110)

Total catches taken from stocks outside safe biological limits declined by 23.1 percentage points between 2000 and 2010. However, after decreasing sharply between 2000 and 2002, annual values fluctuated around an average of 16.3 %, showing no clear trend towards more sustainable fish catches. Total fish stocks therefore remained threatened by overfishing in the North-East Atlantic.

Are fish stocks under continuous threat?

It is not easy to derive clear messages from the indicator itself and the trend it depicts. The fluctuation in the curve of stocks outside safe biological limits is ambiguous because it is also influenced by changes in the annual fishing quota. Moreover, stocks of some species are not only influenced by catches, but also by the availability of species they depend on in the food web. Such an ecological perspective on marine ecosystems, however, is not covered by this indicator.

Box 8.2: EU fishing quotas

Total allowable catches (TACs) form the basis of EU fishing quotas by setting catch limits for the most significant commercial fish stocks. Logistically, the process works as follows:

TACs are proposed by the European Commission on the basis of scientific advice on the state of the stocks concerned and decided on by the Council of Fisheries Ministers.

Fixed shares of TAC are distributed among Member States based on historical shares of catches.

Because they are negotiated in the Council of Fisheries Ministers, TAC decisions become a political issue rather than a technical figure based on scientific evidence. In 2008, the Commission Communication observed that TACs decided by the Council have been 48 % higher on average than the scientifically defined sustainable levels (based on a precautionary approach) ([19]). Moreover, the Commission found it worrying that in European waters, 65 % of the stocks are not fully assessed and only 22 % of stocks under TACs are known not to be overfished ([20]).

([19]) Commission Communication, *Fishing Opportunities for 2009: Policy Statement from the European Commission*, COM(2008) 331.
([20]) Communication from the Commission to the Council concerning a consultation on Fishing Opportunities for 2013, COM(2012) 278 final.

Reform of the Common Fisheries Policy addresses important sustainability issues

Despite the uncertainties from the indicator, it is widely acknowledged that EU fisheries are affected by several interconnected problems. Most fish stocks are being overfished by a fishing fleet that is too large and too efficient (see indicator on fishing fleets p. 227). Besides ecological damage to marine ecosystems, overfishing bears high economic risks for the whole fishing sector.

Box 8.3: Reform of European Fisheries Policy

In 2011, the European Commission presented a new reform package for the Common Fisheries Policy (CFP) ([21]) followed by a proposal for a new fund for the EU's maritime and fisheries policies for the period 2014–2020: the European maritime and fisheries fund (EMFF) ([22]). The reform aims to:

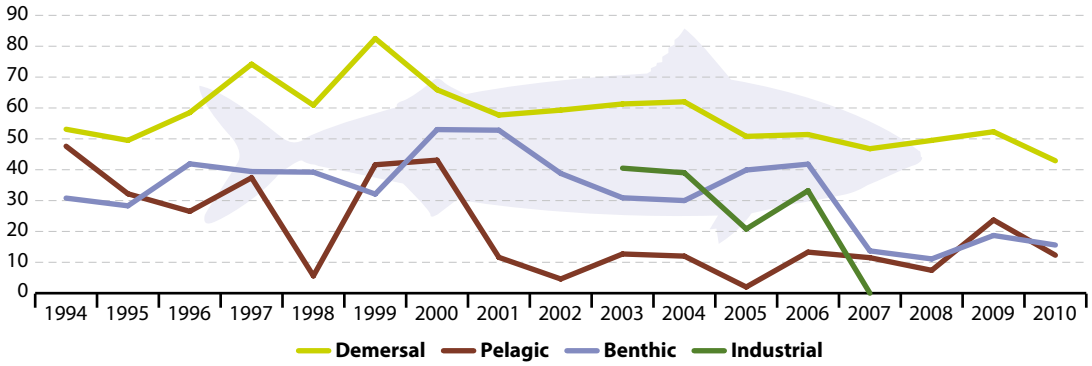
- Secure fish stocks and fishermen's livelihood for the future while putting an end to overfishing and depletion of fish stocks.
- Base fish catches around the maximum sustainable yield ([23]) (MSY) by 2015, ensuring that fish quota are not subject to annual political negotiations, but rather build on scientific evidence and are fixed over a long-term period.
- Help the fishing industry and coastal communities cope with the transition to MSY.
- Ban discards, requiring fishermen to land all fish caught. Discarding not only create a negative image of the fish industry, but it also impedes sustainable stock exploitation and harms marine ecosystems and the financial viability of fisheries.

Agreement was reached between the Council of Ministers and the European Parliament on the reform of the CFP in June 2013, entering into force by 1 January 2014. Regarding the EMFF, the European Commission welcomed the general approach agreed on 15 July 2013 which will run from 2014 to 2020.

Marine reserves or 'no-take zones' have been recognised as an effective tool for conserving and replenishing fish stocks. By nurturing stocks within their boundaries it is expected that these areas also positively affect commercial stocks through a spill-over effect ([24]). In this regard, the implementation of the 2008 Marine Strategy Framework Directive, of which the main objective is to achieve 'good environmental status' in all EU marine regions by 2020, should also offer additional opportunities to address the current issues revolving around the management of marine biodiversity.

Figure 8.4: Fish catches from stocks outside safe biological limits, by category

(%)



NB: EU-managed waters of the North-East Atlantic only (North Sea, Baltic Sea, Bay of Biscal and the Iberian Peninsula), and excluding the Mediterranean Sea and the Black Sea

Source: European Commission services, ICES (online data code: tsdnr110)

([21]) Commission Communication, *Reform of the Common Fisheries Policy*, COM(2011) 417 final.
([22]) Commission proposal for regulation on the European Maritime and Fisheries Fund [repealing Council Regulation (EC) No 1198/2006 and Council Regulation(EC) No 861/2006 and Council Regulation No XXX/2011 on integrated maritime policy, COM(2011) 804 final.
([23]) The MSY is the largest catch that can be taken from a fish stock over an indefinite period without harming it and should be constituted in multiannual plans.
([24]) World Resource Institute, *Fishing for answers. Making sense of the global fish crisis*, Washington, DC, 2004.

Demersal fish *live on or near the bottom of the sea. Typical representatives are stingrays, flounder and halibut.*

Pelagic fish *live in the open sea. Typical representatives are herring, mackerel and tuna.*

For demersal fish, which represent the highest values in unsustainable catches, the declining trend seems to have stabilised since 2005, while values of pelagic fish have fluctuated. In general, fishing depths in the EU have increased, with more deep-sea fish species being harvested ([25]). Deep-sea fish populations are often more vulnerable to the effects of fishing and may suffer greater ecological impacts from overfishing than shallow-water species.

EU trends in conservation of fish stocks compared with other countries in the world

At the global level, exploitation of fish stocks looks even more severe than in EU waters. The latest figures from the Food and Agriculture Organization of the United Nations (FAO) show that 57 % of the global oceanic fish stocks evaluated were 'fully exploited' in 2009, with harvest levels at or near the maximum sustainable yield (MSY). Some 30 % of stocks were 'overexploited', having been fished beyond MSY, and require strong management to rebuild. The share of stocks in this category has tripled since the mid-1970s. This leaves just 13 % of oceanic fish stocks in the 'non-fully exploited' category, down from 40 % in 1974 ([26]).

What lies beneath this indicator?

The stability and biodiversity of fish stocks is key for a continuous fish supply, which is crucial for balanced nutrition and well-being in the EU. This indicator shows the percentage of fish caught in EU-managed waters that are taken from stocks assessed to be outside safe biological limits by the International Council for the Exploration of the Sea. It has to be noted, that the indicator signals problems when overfishing is moderate, but it may undervalue severe cases where catches are low because overfishing has led to a collapse in fish stocks.

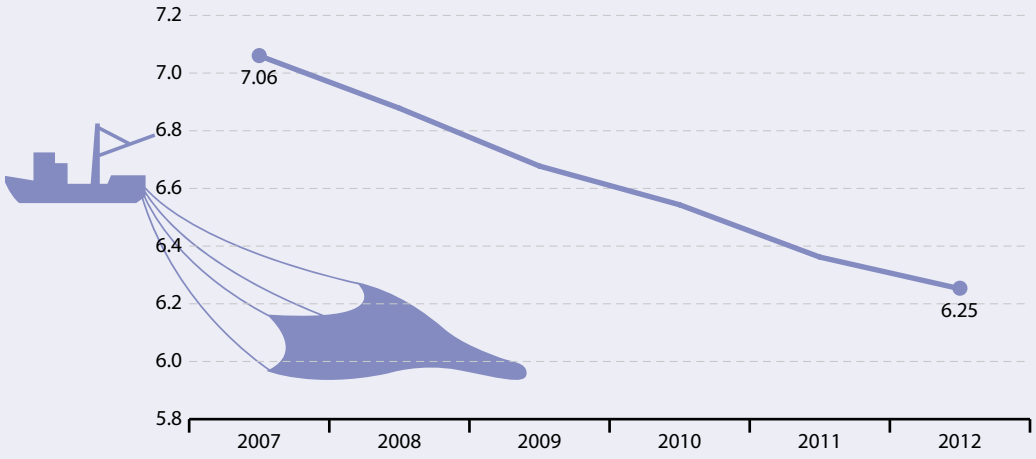
The areas considered cover the North-East Atlantic (North Sea, Baltic Sea, Bay of Biscay and the Iberian Peninsula) and exclude the Mediterranean Sea and the Black Sea, whose management is not the sole responsibility of the EU.

([25]) Villasante S, Morato T, Rodriguez-Gonzalez D, et al. (2012) *Sustainability of deep-sea fish species under the European Union Common Fisheries Policy,* Ocean and Coastal Management 70, pp. 31–37.
([26]) Food and Agriculture Organisation (FAO), *Review of the state of world marine fishery resources*, Rome, 2011

Fishing capacity

2.4 % average annual decrease in EU fishing fleets from 2007 to 2012. Further reduction of fishing capacities in the EU is needed for recovering fish stocks

Figure 8.5: Fishing fleet, total engine power, EU-27
(million kilowatts)



Source: European Commission services, Eurostat (online data code: tsdnr420)

The EU-27 fishing fleet, measured by the total engine power of fishing vessels, decreased by 3.97 % on average per year from 2007 to 2012. An oversized EU fishing fleet has several negative economic consequences which undermine a transition to a green economy: fish stocks are overfished, the economic situation of parts of the fleet is fragile despite high levels of subsidies, jobs in the fishing sector are unattractive and the situation of many coastal communities that depend on fisheries is precarious ([27]).

EU fishery policy at a turning point?

A smaller fishing fleet does not automatically mean fishing capacity is also shrinking. According to the Green Paper on the Reform of the Common Fisheries Policy (CFP) ([28]), decreases in fishing fleets may have been offset by technological progress, which is estimated to increase fishing efficiency by about 2–3 % per year ([29]).

This corresponds to the European Commission's statement that despite a massive EUR 2 730 million being spent on scrapping fishing vessels between 1994 and 2013, the EU fishing capacity is still increasing by about 3 % every year ([30]). The Commission concludes that none of the past policies to tackle the overcapacity of fishing fleets (Multi Annual Guidance Programmes, entry-to-exit ratios, capping the maximum fleet size, public scrapping schemes) have worked. As a result, the current proposal for reforming the CFP considers the introduction of a system of transferable fishing concessions (TFC) as a major driver for fleet capacity adjustment.

Following strict rules, Member States will be made responsible for designing TFC systems for their sea territories. The amount of TFCs given to fishing fleets will be directly bounded to the national fish quotas (see also indicator on conservation of fish stocks, p. 224). It is also recommended that coastal communities dependant on fishing, more environmentally friendly fishing practices and artisanal fleets should be favoured in the allocation of TFCs.

([27]) Commission Communication, *Reform of the Common Fisheries Policy*, COM(2011)417 final
([28]) Commission Green Paper, *Reform of the Common Fisheries Policy*, COM(2009)163.
([29]) Banks, R., Cunningham, S., Davidse, W.P., Lindebo, E., Reed, A., Sourisseau, E. and De Wilde, J.W., *The impact of technological progress on fishing effort*, report prepared for the European Commission, 2002.
([30]) European Commission, *CFP reform — Transferable Fishing Concessions*. Additional information to CFP Reform Package.

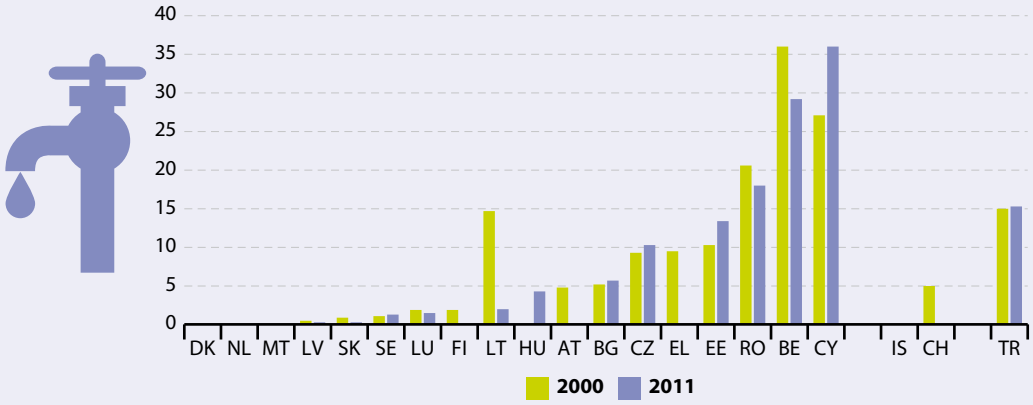
What lies beneath this indicator?

An oversized EU fishing fleet has the potential to deplete crucial fish stocks and reduce the attractiveness of jobs in the fishing sector as well as influence the situation of many fishery-dependent coastal communities. Fishing capacity is expressed here in terms of total engine power of the fishing fleet for registered fishing vessels of EU Member States, Iceland and Norway. The measure only provides a partial indication of a fleet's size and the amount of fish it is expected to catch. The fishing potential or capacity of a fleet also depends on its efficiency (related to the fishing gear used for the actual fishing activity).

Water abstraction

Water abstraction from ground and surface water seems to be sustainable in most Member States. Eleven countries appear to have stabilised abstraction pressure on water resources between 2000 and 2011

Figure 8.6: Surface water abstraction as a share of available resources, by country
(%)



NB: 1999 data for AT, LU, MT, FI and CH (instead of 2000); 2008 data for HU, 2009 data for BE, 2010 data for AT, LV, SE and TR (instead of 2011); no 2000 data for HU and NL, no 2011 data for AT, EL, MT, FI, CH and IS.

Source: Eurostat (online data code: tsdnr310)

Total water abstraction has decreased over the past decade in most European regions, with the exception of South-Western Europe where it has been constant ([31]). Consumption of both surface and groundwater is driven by four main activities: cooling in electricity production; public water supply; the manufacturing industry; and agriculture, forestry and fishing. Overall, 44 % of the total abstracted water is for energy production, 24 % for agriculture, 21 % for public water supply and 11 % for industry.

How water abstraction varies between Member States

The amount of water which is actually available for abstraction is strongly determined by geographical location. Geo-climatic differences strongly influence the amount of surface water and groundwater available for use. Thus the figures vary significantly across the Member States for which data is available. In southern countries, agricultural water abstraction accounts for 60 % of the total ([32]).

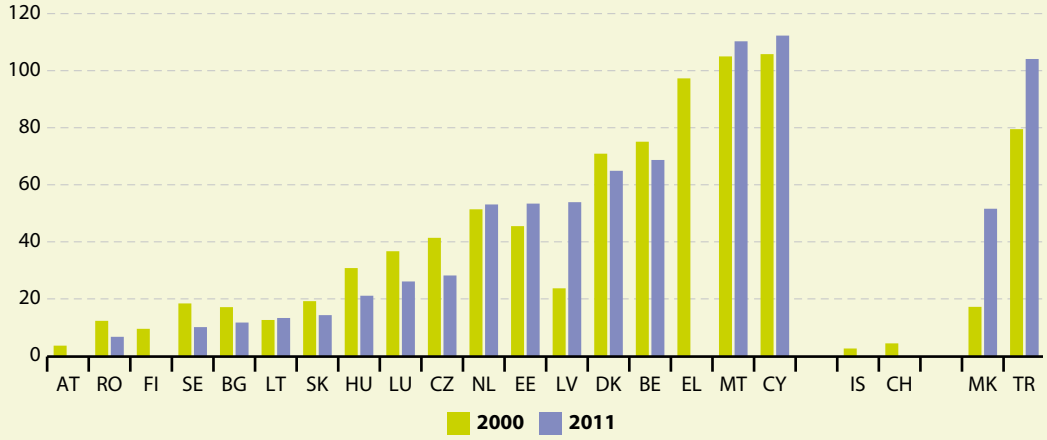
From 2000 to 2011, overall, annual surface water abstraction remained relatively stable in most Member States for which data is available. Only Cyprus, Estonia and — to a limited extent Bulgaria and the Czech Republic — increased surface water abstraction, reaching 36 % of renewable resources in 2011. In contrast, countries such as Lithuania, Romania and Belgium made a major step towards more sustainable abstraction. A study of global water use showed that technological developments improve water use efficiency and save water ([33]). In the domestic sector, improved water infrastructure, advances in water-efficient appliances, water metering and water pricing led to only moderate increases in global water use between 1980 and 1995.

In many Member States groundwater abstraction slightly decreased between 2000 and 2011. However, this mainly counts for those countries whose water abstraction remains within sustainable levels anyway. In other countries such as Malta and Cyprus, which already exceeded a sustainable level, groundwater abstraction even increased further in 2011, albeit slightly.

([31]) See also EEA, Water Exploitation Index, http://www.eea.europa.eu/data-and-maps/indicators/water-exploitation-index
([32]) European Environment Agency, *Water resources across Europe — confronting water scarcity and drought*, EEA Report No 2/2009, Publications Office of the European Union, Luxembourg, 2009
([33]) Flörke, M., Kynast, E., I Bärlund, I. et al. (2013) *Domestic and industrial water uses of the past 60 years as a mirror of socio-economic development: A global simulation study.* Global Environmental Change 23: p. 144–156.

Groundwater *is water stored underground in rocks and soil and makes up more than 97 % of the world's freshwater supply. A total of 75 % of the European population depends on groundwater for their water supply. It is also an important resource for industry and agriculture.*

Figure 8.7: Groundwater abstraction as a share of available resources, by country
(%)



NB: 1999 data for AT, LU and CH, 2001 data for MT and NL (instead of 2000); 2008 data for HU, 2009 data for BE and MK, 2010 data for DK, LV, NL and SE (instead of 2011); no 2011 data for AT, EL, FI, CH and IS.

Source: Eurostat (online data code: tsdnr310)

How successful is current EU Water Policy?

Unfortunately, the measures developed and implemented by Member States in reaction to the Communication on water scarcity and droughts in the EU were found to be limited and in some cases even contradictory to achieving its objectives ([34]). This shows the need for a new impulse from the EU to step up efforts to protect water resources. The protection of water resources is also a critical part in the 'Blueprint to safeguard Europe's water resources' ([35]), which was published in late 2012.

Box 8.4: Key documents and legal instruments in EU water policy

The Water Framework Directive ([36]) is the main legal instrument for water policy in the EU and aims to achieve coherent and sustainable water management in terms of quality and quantity.

The EU Blueprint to safeguard Europe's water resources is the current EU water policies strategy and outlines actions that focus on: better implementation of current water legislation, integration of water policy objectives into other policies, and filling gaps about water quantity and efficiency.

The Communication on water scarcity and droughts in the EU ([37]) proposes that European institutions focus on seven main policy options to tackle water scarcity problems, including for example the improvement of drought risk management and fostering water efficient technologies and practices.

What lies beneath this indicator?

Availability of freshwater is fundamental to human well-being and many economic activities. Thus, this indicator shows total water abstraction per year as a percentage of the long-term renewable available water resources (yearly average), separated into groundwater and surface water.

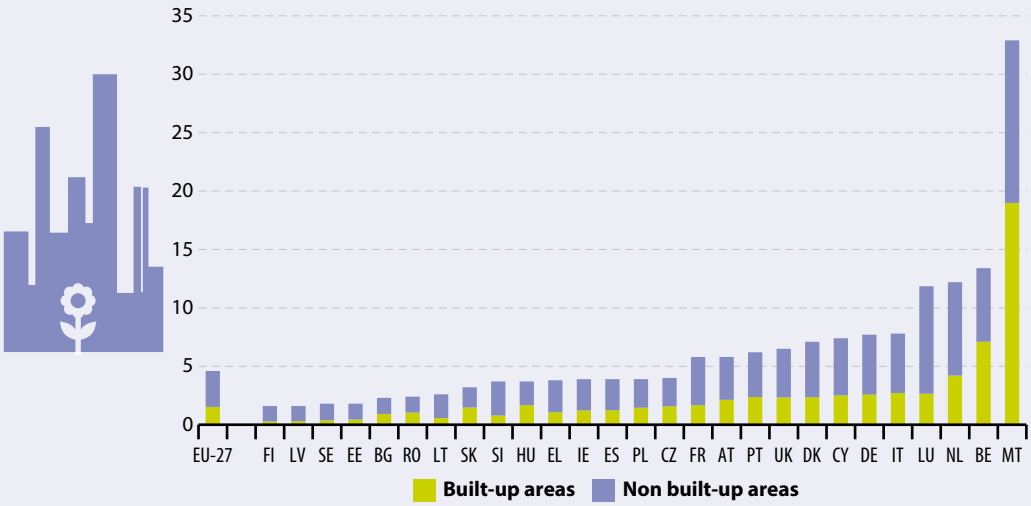
However, the mean values used by this indicator do not depict variations in the availability and demand for water in different regions of individual countries. Hence, severe water scarcities at the local level, which occur in the EU, cannot be highlighted.

([34]) Strosser P., Dworak, T., Garzon Delvaux, P.A., Berglund, M., Schmidt, G., Mysiak, J., Kossida, M., Iacovides, I., Ashton, V. (2012) *Gap Analysis of the Water Scarcity and Droughts Policy in the EU.*
([35]) Commission Communication, *The blueprint to safeguard Europe's water resources*, COM(2012)673.
([36]) Directive 2000/60/EC establishing a framework for Community action in the field of water policy.
([37]) Commission Communication, *Addressing the challenge of water scarcity and droughts*, COM(2007)414.

Built-up areas

4.6 % of the EU land area was covered by artificial areas in 2012. Urbanisation and increasing transport infrastructure are the main drivers of land sealing

Figure 8.8: Artificial land cover and built-up areas, EU-27, 2012
(% share of total area of country)



Source: Eurostat, LUCAS 2012 — preliminary results

Artificial areas, both built-up (mainly buildings and greenhouses) and non-built-up (areas covered by artificial surfaces), are continuously encroaching on farmland, forests and semi-natural land ([38]). Across the EU, almost 5 % of the land area is artificial. About two thirds of this artificial area is non built-up land, mainly transport infrastructure (such as roads, railways) and parking areas ([39]).

Box 8.5: Mitigating the impacts of artificial land cover and built-up areas

Under Target 2 of the EU Biodiversity Strategy to 2020 the concept of green infrastructure (see Box 8.1) plays a central role in mitigating the impacts of artificial land cover and built-up areas on habitat fragmentation and helps to restore ecosystems and their services ([40]). The 'land take' milestone within the Resource Efficiency Roadmap acts as a further measure to increase the consideration of environmental needs in land use decisions; the aim is to limit soil sealing and achieve no net land take by 2050. These approaches should contribute to the protection of biodiversity and to human well-being, for example by restoring floodplains instead of building dikes to protect against flooding.

([38]) EEA 2012, *Environmental Indicator Report, 2012, Ecosystem Resilience and Resource Efficiency in a Green Economy in Europe*. Copenhagen.
([39]) Eurostat 2011, *Regional yearbook 2011*, Chapter 12 Land cover and land use, pp. 157–167. http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p_product_code=KS-HA-11-001-12, accessed 22 August, 2013.
([40]) EEA 2011, *Green infrastructure and territorial cohesion. The concept of green infrastructure and its integration into policies using monitoring systems*, EEA Technical report No 18/2011, Copenhagen.

How coverage by artificial land and built-up areas varies between Member States

The highest shares of artificial areas in total land area were recorded in Malta (32.9 %), Belgium (13.4 %), the Netherlands (12.2 %) and Luxembourg (11.9 %). The 'Benelux' countries host the most densely populated regions and thus are the most densely built-up and non-built up areas ([41]). Two Nordic and two Baltic countries rank lowest: Finland and Latvia (1.6 % each) and Sweden and Estonia (1.8 % each). These countries are among the least densely populated and therefore, artificial area coverage is low.

What lies beneath this indicator?

Artificial areas cause the sealing of soils and large-scale fragmentation of ecosystems. They also indicate a reduction in semi-natural and farmland areas. This negatively impacts on biodiversity, as fragmented habitats strongly reduce the range available to animals for migration, exchange of genetic material between populations, breeding or finding food ([42]). Furthermore, surface sealing associated with artificial areas impacts soils and the essential functions it serves, such as purifying water or protecting against floods via the storage of water ([43]). Therefore, reducing the annual share of land area being converted to artificial land or built-up areas serves to avoid these negative direct and indirect impacts.

This indicator shows both the share of land covered by artificial land and built up areas in a given year and the percentage change observed in artificial areas over a given period of time.

([41]) Eurostat, 2011, *Regional yearbook 2011*, Chapter 12 Land cover and land use, pp. 157–167.
([42]) EEA-FOEN, 2011, *Landscape fragmentation in Europe*, EEA Report No 2/2011, Copenhagen.
([43]) EEA, 2011, *Urban soil sealing in Europe* (accessed 22 August 2013).

9

Global partnership

Global partnership seen through the lens of the Green Economy

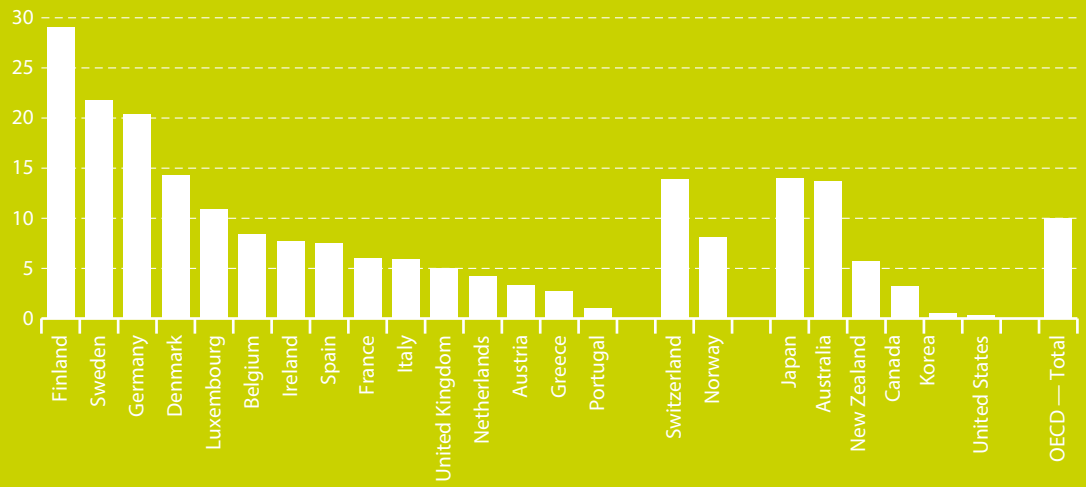
From 'how much ODA?' to 'ODA for what purpose?' — tracking ODA related to climate change adaptation

Official development assistance (ODA) is administered with the promotion of economic development and welfare in developing countries as its main objective. However, apart from looking at how much ODA is actually spent by developed countries, attention is increasingly put on the question of the purpose for which ODA is actually spent.

In December 2009 the OECD's Development Assistance Committee (DAC) members approved on tracking the amount of ODA that supports the objectives of the Rio Conventions in climate change adaptation ([1]). The aim is to allow presenting a more complete picture of aid in support of developing countries' efforts to address climate change.

In 2011, 10 % of the ODA spent by the OECD as a whole was related to climate change adaptation. The shares were highest for ODA from Finland, Sweden and Germany, at more than 20 %. Above average contributions also stemmed from the European countries Denmark and Switzerland as well as from Japan and Australia, all with a share close to 15 %.

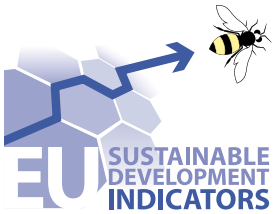
Official development assistance related to climate change adaptation, 2011
(% of total ODA)



NB: 2010 data for Greece and France.

Source: OECD (data code: GG_E321)

([1]) The United Nations Framework Convention on Climate Change (UNFCCC) is one of three so-called 'Rio Conventions' that derive directly from the 1992 'Earth Summit' held in Rio de Janeiro.



Overview of main changes

Many of the indicators in the global partnership theme are linked to some extent to the EU's economic situation. For this reason, several indicators show clear impacts from the onset of the financial and economic crisis in 2008. This is particularly visible in the case of the headline indicator 'official development assistance' (ODA) where overall flows fell during the economic downturn. Although the EU remains the world's largest donor, it is not on-track to meet its long-standing target of dedicating 0.7 % of its gross national income (GNI) to ODA in 2015. Nevertheless, the share of ODA for least-developed countries did improve in the decade 2000 to 2010. Also, although ODA to developing countries is insufficient to meet the EU's targets, it remains a largely stable source of finance in absolute terms. A negative trend that emerges is the fluctuation of private financial flows. These fluctuations can create unpredictability for developing countries that are particularly reliant on external financial support.

In relation to trade, EU imports from developing countries have increased, mainly been driven by imports from China, while imports from least-developed countries represented considerably lower shares of overall EU imports. The largest increase among imports from least-developed countries has been in the category of mineral fuels and lubricants.

With regards to global resource management, the gap in CO_2 emissions per inhabitant has narrowed between the EU and developing countries, although this is in large part due to the economic crisis and increased emissions from developing countries.

Table 9.1: Evaluation of changes in the global partnership theme (EU-27, from 2000) (1)

Level 1	Level 2	Level 3
Official development assistance (ODA) (*)	**Financing for sustainable development**	
	Financing for developing countries	Share of official development assistance for least-developed countries
		Share of foreign direct investment in low-income countries
	Globalisation of trade	
	Imports from developing countries	Share of imports from least-developed countries
	Global resource management	
	: CO_2 emissions per inhabitant	

(*) From 2004.

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.

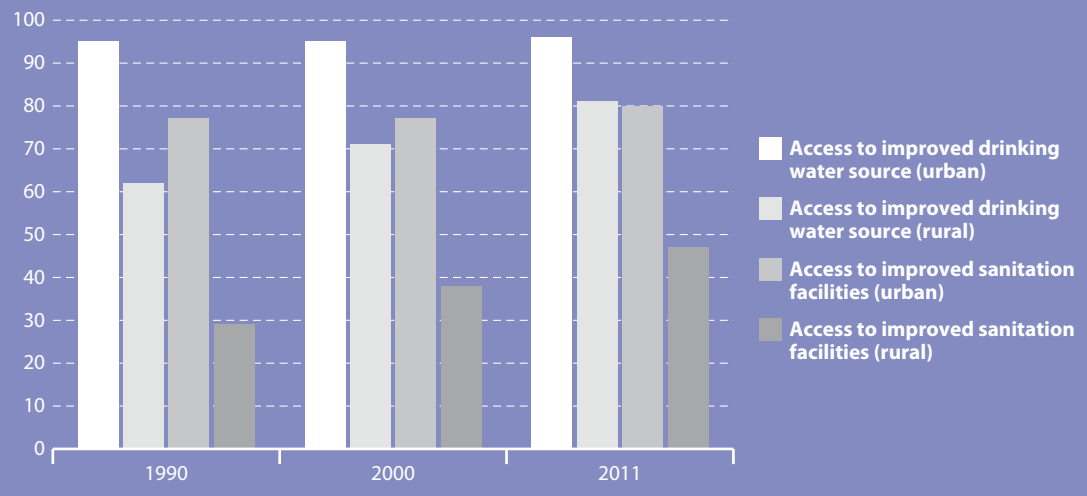
Global partnership seen through the lens of Quality of Life

Access to drinking water and sanitation — progress notable but still insufficient

By the end of 2011 about 89 % of the world population had access to an improved drinking-water source. Although the Millennium Development Goals (MDG) target on access to drinking water has already been met overall, serious concerns remain regarding the access to, quality and safety of drinking water for the rural poor ([1]). According to estimates, 83 % of the population without access to drinking water (636 million) live in rural areas. Furthermore, about 38 % of the people using an improved drinking water source do not enjoy the convenience and associated health and economic benefits of piped supply at home.

Improvements have also been achieved in access to sanitation facilities; since 1990 almost 1.9 million people worldwide have gained access to improved sanitation facilities. However, progress is still insufficient for countries to stay on-track with the MDG sanitation target. To meet the target coverage must extend to 75 % from the current level of 64 %.

World access to drinking water and sanitation facilities
(% of population)



Source: World Health Organisation and UNICEF

([1]) WHO and UNICEF, *Progress on sanitation and drinking-water — 2013 update*.

Why do we deal with global partnership?

Advancing global partnership for development is one of the core Millennium Development Goals (MDGs) ([2]). Presented as the eighth MDG, global partnership for development reflects mutual responsibilities for both developed and developing countries to achieve the other seven MDGs which deal, respectively, with poverty, education, gender equality, child mortality, maternal health, poverty diseases and the environment. As early as in 1987, the Brundtland report ([3]) had emphasised the urgency of meeting the essential needs of the world's poor to achieve sustainable development. To that end it also highlighted the importance of collective action and the idea of sitting 'all in one boat', which is at the core of the concept of global partnership.

Against this background, one of the EU Sustainable Development Strategy's objectives is to promote sustainable development actively worldwide. For this purpose, the EU does not only take specific development-related actions, including action towards its international commitments on development financing, but it is also committed to the objective of policy coherence for development. Policy coherence for development aims 'to ensure that, as much as possible, a state's policies other than its development cooperation policy do not undermine ('do no harm') and indeed also support development. This applies to both external policies (such as for trade or security) and internal policies (for example, for agriculture or finance) that have external effects, which is increasingly the case as globalisation intensifies' ([4]).

Today's world is economically, socially and environmentally interconnected. A country pursuing the well-being of its citizens is likely to affect, directly or indirectly, positively or negatively, the well-being of citizens in other countries. Globally, the effects of unsustainable patterns of current economic development are still largely determined by developed countries and increasingly by emerging economies, while poorer countries are disproportionately impacted and have the least resources to cope with negative effects ([5]).

To tackle these challenges the EU contributes directly to sustainable development in developing countries. It does so through financial flows, both public and private, to these countries. In addition, it supports them with special policies in trade flows, which constitute a source of revenue for the developing countries. Since it is not only important how much is traded with developing countries, what is traded is also a special focus of monitoring. The same is valid with regard to the differences in natural resource use in the EU and developing countries.

The EU's policies may impact, for example, on the number of people seeking to migrate to the EU as a result of the situation in their countries of origin. The EU also affects developing countries by its resource use; extraction of natural resources may have negative impacts on the ground in developing countries, but also provides a potential source of income for them. More and more resources are imported into the EU from third countries, and more than half of the energy used in the EU actually comes from outside.

([2]) The Millennium Development Goals are a set of eight development-related objectives that the international community seeks to achieve by 2015.
([3]) World Commission on Environment and Development, *Our common future*, 1987.
([4]) Definition used in the European Report on Development (2013), *Post-2015: Global Action for an Inclusive and Sustainable Future, Overseas Development Institute (ODI)*, German Development Institute/Deutsches Institut für Entwicklungspolitik (DIE), European Centre for Development Policy Management (ECDPM), Brussels, 2013, http://www.erd-report.eu/erd/index.html, p. 19.
([5]) European Commission, *A decent life for all: Ending poverty and giving the world a sustainable future*, COM(2013) 92 final.

How does the EU address global partnership?

The EU Sustainable Development Strategy (EU SDS) ([6]) dedicates one of its seven key challenges to global poverty and sustainable development challenges with the overall objective 'to actively promote sustainable development worldwide and ensure that the European Union's internal and external policies are consistent with global sustainable development and its international commitments'. To this end, the EU SDS sets out the following operational objectives and targets:

- Make significant progress towards meeting the commitments of the EU with regard to internationally agreed goals and targets, in particular those contained in the Millennium Declaration ([7]) and those deriving from The World Summit on Sustainable Development held in Johannesburg in 2002 ([8]), and related processes such as the Monterey Consensus on Financing for Development ([9]), the Doha Development Agenda ([10]) and the Paris Declaration on Aid Effectiveness ([11]) and the Accra Agenda for Action ([12]).
- Contribute to improving international environmental governance, in particular in the context of the follow-up to the 2005 World Summit outcome ([13]), and to strengthening multilateral environmental agreements (MEAs).
- Raise the volume of aid to 0.7 % of gross national income by 2015 with an intermediate target of 0.56 % in 2010.
- Promote sustainable development in the context of the negotiations of the World Trade Organisation (WTO), in accordance with the preamble to the Marrakesh Agreement establishing the WTO ([14]) which sets sustainable development as one of its main objectives.
- Increase the effectiveness, coherence and quality of EU and Member States' aid policies in the period 2005–2010.
- Include sustainable development concerns in all EU external policies, including the common foreign and security policy, inter alia, by making it an objective of multilateral and bilateral development cooperation.

Selection of EU policy instruments for improving global partnership

The **European Consensus on Development** adopted in December 2005 ([15]) reflects the European Union's willingness to make a decisive contribution to eradicate poverty in the world and to help build a more peaceful and equitable world. It identifies shared values, goals, principles and commitments to be implemented in EU and Member State development policies. In particular, these include a focus on poverty reduction and achievement of the Millennium Development Goals; a commitment to increased levels of official development assistance of 0.7 % by 2015; and improved coordination of aid with other development work in the beneficiary country for greater effectiveness.

In 2012, the Council endorsed the 'Agenda for Change' ([16]) for EU development policy which puts renewed emphasis on good governance; social protection, health and education; sustainable agriculture and clean energy. The strategy also calls for a 'differentiated' EU approach to aid allocation and development partnerships, whereby the EU should seek to target its resources where they are most needed and for greatest impact on poverty reduction.

One way in which action is taken to implement the SDS objective of increasing 'the effectiveness, coherence and quality of EU and Member State's aid' is through EU Joint Programming of Aid. This is an enhanced approach to development cooperation which — through improved coordination between the EU and its Member States — aims to increase the impact and the results of aid, as well as transparency and predictability ([17]). Furthermore, according to the EU's Transparency Guarantee all information on aid programmes is to be publicly disclosed so that it can be more easily accessed, shared and published by

([6]) The Council of the European Union, *Review of the EU Sustainable Development Strategy (EU SDS) – Renewed Strategy*, 26 June 2006.
([7]) United Nations, *Resolution adopted by the General Assembly, United Nations Millenium Declaration*, 2000; also known as the Millennium Development Goals (MDGs).
([8]) World Summit on Sustainable Development, Johannesburg, 2002.
([9]) United Nations, *Monterrey Consensus on Financing for Development*, 2003.
([10]) World Trade Organisation, *Doha Development Agenda*, 2001.
([11]) Organization for Economic Co-operation and Development High-Level Forum on Aid Effectiveness, *Paris Declaration on Aid Effectiveness*, Paris, 2005.
([12]) Accra Agenda for Action, 2008.
([13]) United Nations General Assembly, *2005 World Summit Outcome*, 2005.
([14]) World Trade Organisation, *Marrakesh Agreement*, 1994.
([15]) European Parliament, Council, Commission, *Joint statement by the Council and the representatives of the governments of the Member States meeting within the Council, the European Parliament and the Commission on European Union Development Policy: 'The European Consensus'*,2005.
([16]) European Commission, *Increasing the impact of EU Development Policy: an Agenda for Change*, COM(2011) 637.
([17]) EU Press Release, *Busan: The EU's work on aid effectiveness*, MEMO/11/844 Brussels, 30 November 2011.

citizens and governments in donor and beneficiary countries ([18]).

In February 2013, the Commission adopted the Communication 'A Decent Life for All: ending poverty and giving the world a sustainable future' ([19]). The Communication puts forward a common EU approach for a single post-2015 development framework, integrating the review of the MDGs and the follow up to the 2012 United Nations Conference on Sustainable Development (Rio+20). One of the outcomes of Rio+20 was the agreement to launch a process to develop a set of sustainable development goals (SDGs).

In July 2013, the European Commission adopted a Communication putting forward possible elements of a common EU approach to financing post-2015, titled 'Beyond 2015, Towards a Comprehensive and Integrated Approach to Financing Poverty Eradication and Sustainable Development'. Building on 'A Decent Life for all', which focuses on the 'what' to put on the future development framework, this communication turns the attention to the 'how' to finance it, the type of resources available that could be mobilised, the principles that should guide the Commission's work and the processes that could help put those into practice.

Further reading on global partnership

European Commission, *EU Contribution to the Millennium Development Goals — Key results from European Commission programmes*, 2013

European Commission, Staff Working Paper: *EU Accountability Report 2013 on Financing for Development Review of progress by the EU and its Member States*, SWD (2013) 273, 2013

European Commission, Communication, *An EU policy framework to assist developing countries in addressing food security challenges*, COM(2010)127 final, 2010

European Commission, Green Paper, *EU development policy in support of inclusive growth and sustainable development Increasing the impact of EU development policy*, COM(2010) 629 final, 2010

Eurostat, *Statistics in Focus: EU remittances back on the increase in 2010*, Issue number 4/2012, 2012

Organization for Economic Co-operation and Development High-Level Forum on Aid Effectiveness, *Paris Declaration on Aid Effectiveness*, 2005 and Accra Agenda for Action, 2008

Organization for Economic Co-operation and Development, *Development Cooperation Report 2010*, Paris, 2010

Organization for Economic Co-operation and Development High-Level Forum on Aid Effectiveness, *Busan Partnership Agreement*, 2011

Overseas Development Institute (ODI), German Development Institute/Deutsches Institut für Entwicklungspolitik (DIE), European Centre for Development Policy Management (ECDPM), *European Report on Development, Post-2015: Global Action for an Inclusive and Sustainable Future*, 2013

United Nations, *A New Global Partnership: eradicate poverty and transform economies through sustainable development, The report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda*, 2013

United Nations, *Doha Declaration on Financing for Development: outcome document of the follow-up international conference on financing for development to review the implementation of the Monterrey consensus*, 2008

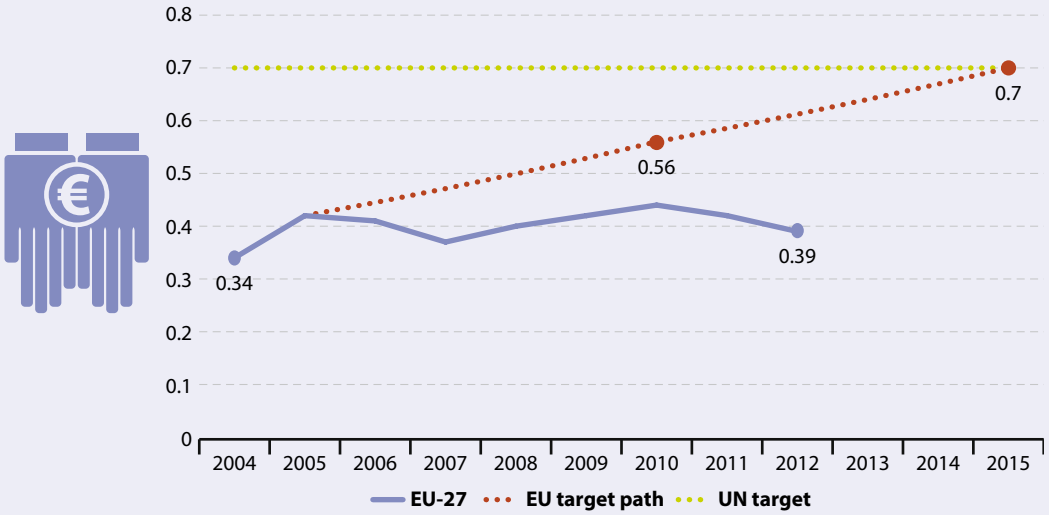
United Nations, *Monterrey Consensus on Financing for Development*, 2002

([18]) European Commission, *The EU's commitment to transparency*.
([19]) European Commission, *A Decent Life for All: Ending poverty and giving the world a sustainable future*, COM (2013) 92.

Official development assistance

0.05 percentage point increase in official development assistance (ODA) in the EU between 2004 and 2012. This is not enough to meet the UN target of dedicating 0.7 % of gross national income to ODA by 2015

Figure 9.1: Official development assistance as a share of gross national income, EU-27 (% of GNI)



NB: 2012 data are preliminary.

Source: OECD, European Commission services, Eurostat (online data code: tsdgp100)

Gross national income (GNI) *is the sum of incomes of residents of an economy in a given period. It is equal to gross national product (GDP) minus primary income payable by resident units to non-resident units, plus primary income receivable from the rest of the world.*

Between 2004 and 2012 the share of gross national income (GNI) spent by the EU-27 on official development assistance (ODA) (the assistance granted to the developing countries) grew by less than 2 % annually. Between 2010 and 2012 the total ODA of EU Member States even decreased from 0.44% to 0.39 %, in the face of continued budgetary constraints resulting from the economic crisis ([20]). Thus without substantial additional efforts by most Member States, the EU's long-standing collective commitment to dedicating 0.7 % of its GNI to official development assistance by 2015 is unlikely to be met. The EU already missed its collective interim target of dedicating 0.56 % of its GNI to ODA in 2010; the share in that year was 0.44 %.

Despite the economic crisis EU citizens still believe overseas assistance is important

Notwithstanding the economic crisis, EU citizens continue to think that providing assistance to developing countries is important. In a 2012 survey, more than 60 % said either that increases in ODA should be made beyond promises already given or that given promises should be kept ([21]).

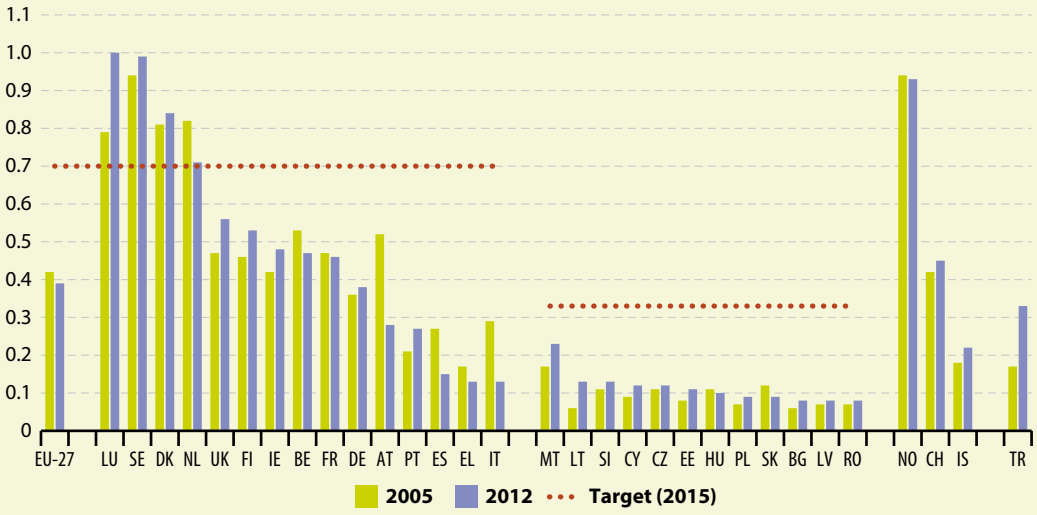
How ODA varies between Member States

The EU has committed itself to a collective target of 0.7 % for 2015, and the same target applies to many Member States. However, those Member States that joined the EU after 2004 pledged to increase by 2015 their ODA/GNI to 0.33 % ([22]).

([20]) Council of the European Union, *Council Conclusions on the Annual Report 2013 to the European Council on EU Development Aid Targets*, Brussels, 28 May 2013
([21]) European Commission, *Special Eurobarometer 392, Solidarity That Spans The Globe, Europeans and Development Aid — Report*, 2012, p. 16
([22]) Council of the European Union, *Annual Report 2013 to the European Council on EU Development Aid Targets — Council Conclusions*, 28 May 2013

In 2012 ODA/GNI shares in the EU ranged from 1.00 % in Luxembourg to 0.08 % in Romania, Bulgaria and Latvia. Four Member States — Luxembourg, Sweden, Denmark and Netherlands — exceeded the 0.7 % target in 2012. The ODA/GNI share fell in 15 EU Member States between 2011 and 2012. Between 2005 and 2012 the largest increase took place in Luxembourg (by 0.21 percentage points), and the largest decrease (by — 0.24 percentage points) was in Austria.

Figure 9.2: Official development assistance as share of gross national income, by country
(% of GNI)



NB: 2012 data are preliminary, 2007 data for BG and RO (instead of 2005).

Source: OECD, European Commission services, Eurostat (online data code: tsdgp100)

Aid for social infrastructure and services *covers basic education, primary health care, nutrition, safe water and sanitation. The proportion of bilateral ODA dedicated to these is one of the indicators used to measure progress towards Millennium Development Goal 8, 'develop a global partnership for development'.*

Translating 'how much ODA?' into 'ODA for what purpose?'

'How much?' is not the only important question about EU ODA. Another important aspect is 'what' ODA is spent on.

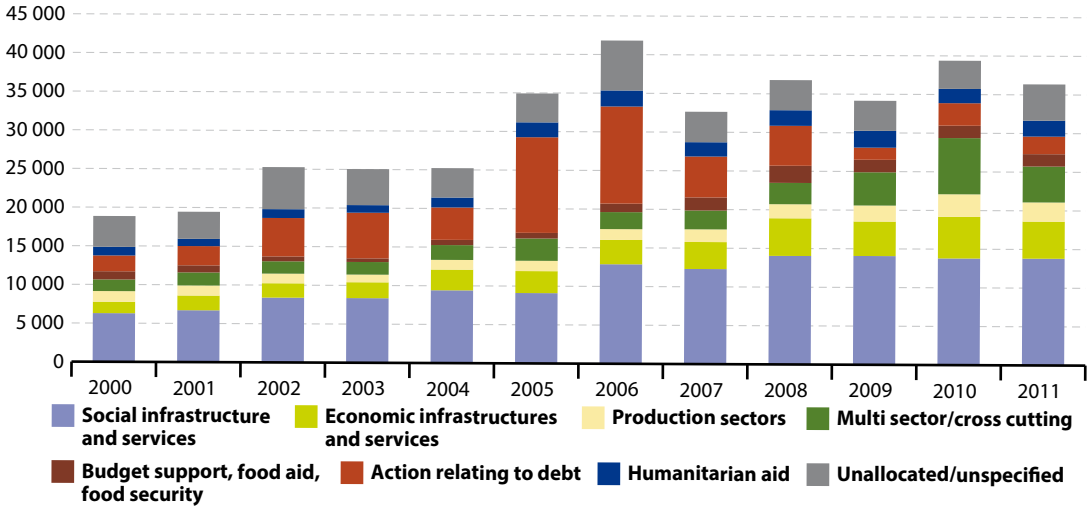
In 2011, the EU-15 ([23]) Member States spent most of their bilateral aid (aid given directly to a specific country as opposed to a multilateral organisation) on social infrastructure and services. In 2011, the EU-15 Member States spent the least on budget support, food aid and food security.

The largest percentage increase was in the category for 'multi-sector/cross-cutting' purposes between 2004 to 2011, with more than 240 % over that period. Debt-related actions are the only category where bilateral aid decreased between 2004 and 2011.

Environmental protection measures are an example of ***cross-cutting activities****. They include capacity-building for developing environmental policy, laws, regulations and economic instruments, environmental research or flood protection measures.*

([23]) Data on bilateral aid is only available for the EU-15 countries.

Figure 9.3: Bilateral official development assistance, by category, EU-15
(EUR 1 000 million; at current values) ([24])

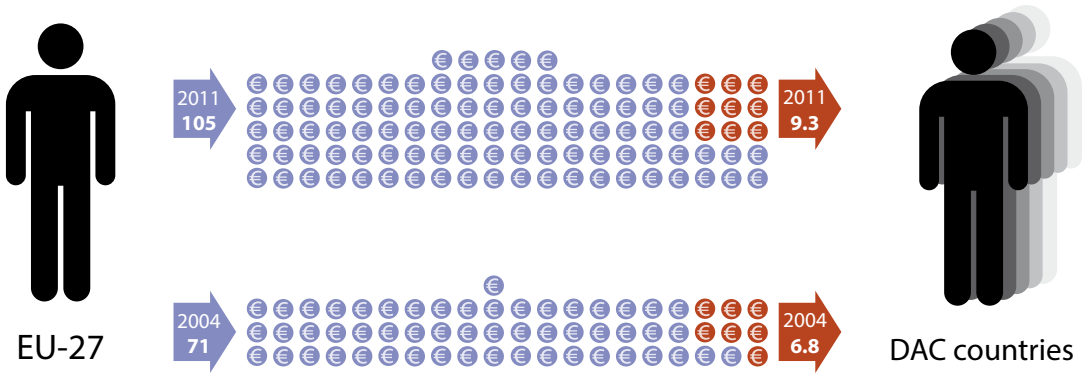


Source: Eurostat (online data code: tsdgp350)

ODA per capita in EU and developing countries has increased

ODA can furthermore be analysed in relation to the average amount of assistance spent per inhabitant in donor countries and the amount received per inhabitant in developing countries. While in 2004 the EU spent an annual EUR 71 per capita on ODA, the figure in 2011 was EUR 105, representing an increase of almost 50 % over that period. However, this growth is not entirely reflected in ODA received per person in developing countries. Although there was a 37 % increase in ODA received per capita, this change amounted to a growth from EUR 6.8 in 2004 to EUR 9.3 in 2011.

Figure 9.4: Official Development Assistance per capita in donor and recipient countries
(EUR per inhabitant; at current values)



NB: For EU total, the nominator refers to the ODA sum of all Member States for which data are available in a given year (and not necessarily EU-15 before 2007 and EU-27 after 2007); the denominator always refers to the total EU-27 population.

Source: OECD, Eurostat (online data code: tsdgp520)

([24]) Data indicated in current values are not adjusted for inflation, and are thus expressed in actual monetary flows in a given year. Data in constant values are adjusted for inflation. They are calculated by removing the price increases or decreases and leave only the volume changes.

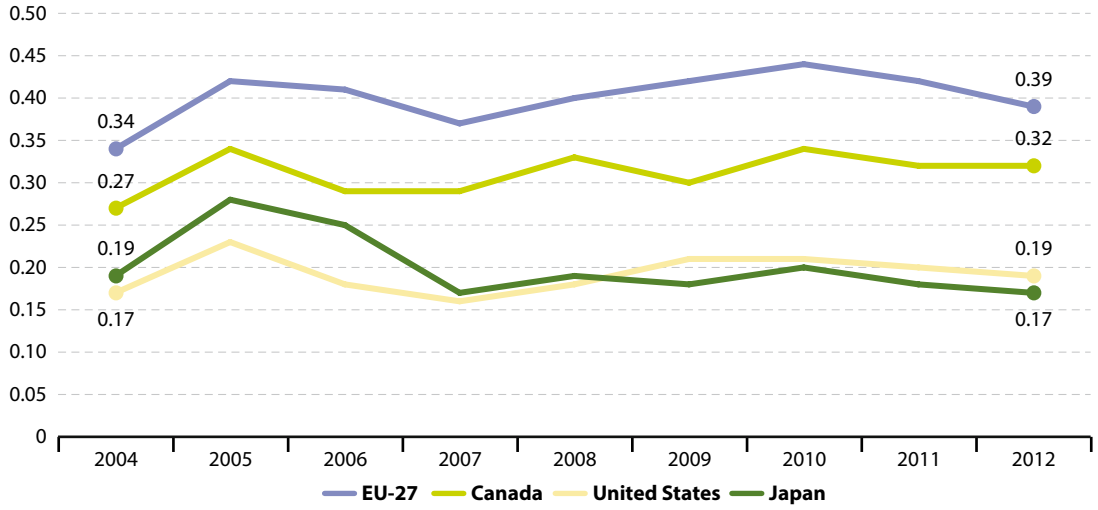
EU trends in ODA compared with other countries in the world

In 2012, the EU maintained its position as the biggest ODA donor globally in absolute terms, providing over half of total ODA made available by OECD DAC countries ([25]).This figure refers to the total ODA of the EU's Member States ([26]). However, the 2012 share of aid from the European Union's DAC members in all aid from DAC donors was at its lowest level since 2001 ([27]).

Otherwise the picture over time observed within the EU is similar to that of other major donor countries. For example, in the US the ODA/GNI share decreased from 0.21 % in 2010 to 0.19 % in 2012. Japan dedicated 0.20 % of its GNI to ODA in 2010, but only 0.17 % in 2012 ([28]). Total ODA from OECD donor countries dropped by 2 % between 2010 and 2011, and another 4 % between 2011 and 2012 ([29]). At the same time, aid is increasing from emerging donors, such as Turkey or the United Arab Emirates ([30]).

*The **Development Assistance Committee (DAC)** of the OECD is a forum of selected OECD member states that are also major donor countries set up to discuss issues surrounding development cooperation. The DAC also monitors financial flows to developing countries. Nineteen EU Member States, including the EU itself, are DAC members.*

Figure 9.5: Official development assistance as a share of gross national income, by donor
(% of GNI)



NB: EU-27 data for 2012 data are provisional.

Source: OECD, European Commission services, Eurostat (online data code: tsdgp100)

What lies beneath this indicator?

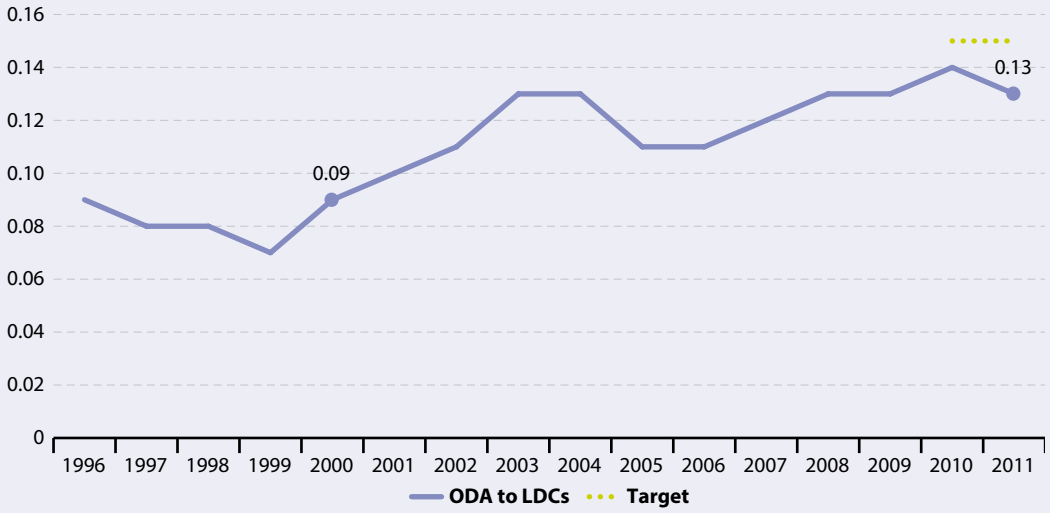
Official Development Assistance consists of grants or loans provided by official agencies, including state and local governments, or by their executive agencies, to countries and territories on the Organisation for Economic Development and Cooperation's Development Assistance Committee (OECD DAC) List of ODA Recipients and to multilateral development institutions ([31]). ODA is administered with the promotion of the economic development and welfare of developing countries as its main objective; conveying a grant element of at least 25 % (calculated at a rate of discount of 10 %) and concessional in character. ODA is reported by donors to the OECD by purpose.

([25]) OECD, *Aid to poor countries slips further as governments tighten budgets*, 3 April 2013.
([26]) 51 % of this is provided by EU-DAC members (currently 17 EU Member States).
([27]) United Nations, *The Millennium Development Goals Report 2013*, 2013, p. 53.
([28]) UNSTATS, *Millennium Development Goals Indicators: Net ODA as percentage of OECD/DAC donors GNI*.
([29]) United Nations, *The Millennium Development Goals Report 2013*, 2013, p. 52.
([30]) United Nations, *The Millennium Development Goals Report 2013*, 2013, p. 53.
([31]) OECD, *DAC List of ODA Recipients*.

Share of official development assistance for least-developed countries

3.4 % annual increase in EU ODA to least-developed countries between 2000 and 2011. The increase was not enough for the EU to reach its 2010 target of dedicating 0.15 to 0.20 % of gross national income to ODA in least-developed countries

Figure 9.6: ODA to least-developed countries (LDCs), EU-15
(% of GNI; at constant 2011 values)



NB: ODA including imputed multilateral aid (i.e. flows to multilateral organisations such as the UN, the World Bank, etc.)

Source: European Commission Services

Least developed countries (LDCs) *are, according to a classification by international organisations, countries with particularly low levels of economic and human development. There are currently almost 50 in the world.*

Other Low Income Countries (OLICs) *are countries with a per capita gross national income (GNI) below or equal to USD 1 005 in 2010.*

The European Consensus on Development ([32]) stresses the necessity to dedicate a high proportion of ODA to least developed countries (LDCs) and other low income countries (OLICs). In 2008 EU Member States pledged to this end to collectively provide between 0.15 % and 0.20 % of their gross national income (GNI) to ODA in least-developed countries by 2010 ([33]). Between 2000 and 2011 the share of ODA for least-developed countries increased; however, it increased only by about two thirds of what would have been needed to reach the 0.15 % target by 2010. Hence, in 2011 this assistance was still below the 0.15–0.20 % target.

Least-developed countries are particularly reliant on ODA

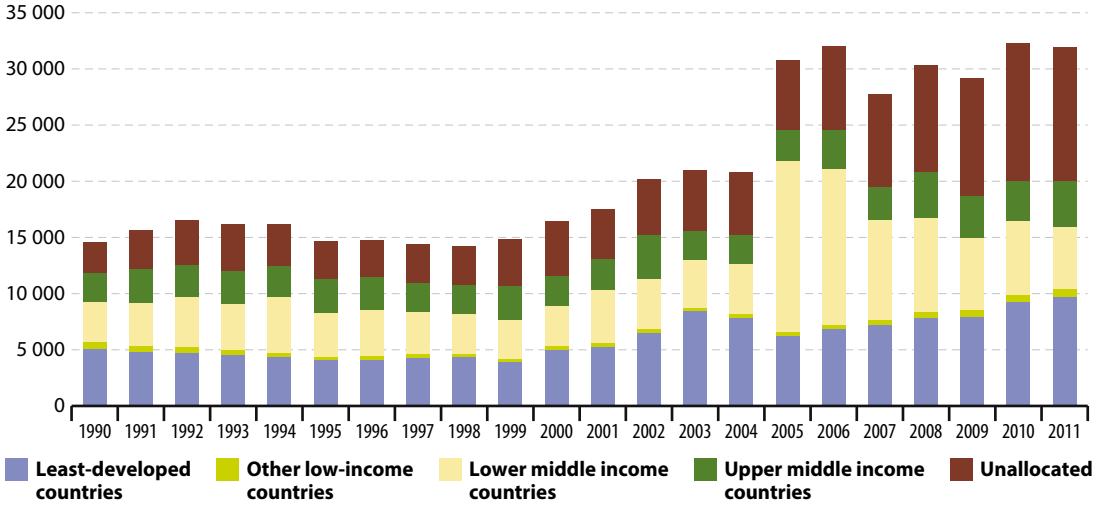
ODA is particularly significant for low-income countries. The poorest countries, especially those that are resource-scarce, may not attract foreign direct investment. In addition, their level of domestic resource mobilisation and domestic investment remains low, making them particularly reliant on external aid and development finance ([34]). The macro-economic stability of these countries is thus vulnerable to the fluctuations in the overall volume of aid as well as donor preferences for this aid ([48]). During a period of total growth (2004 to 2006), the share of ODA to lower middle income countries (LMICs) increased, while the share for LDCs decreased. This trend subsequently saw a reversal in the latter part of the decade and since 2009 LDCs have received a greater percentage of ODA than LMICs. By 2011 LDCs and OLICs taken together made up 52.2 % of the total share of country-allocated ODA. This shows an overall favourable trend in support of development in these most vulnerable countries.

Lower middle income countries (LMIC) *are countries with a per capita GNI between USD 1 006 and USD 3 975 in 2010.*

Upper middle income countries (UMIC) *are countries with a per capita GNI between USD 3 976 and USD 12 275 in 2010.*

([32]) The European Consensus on Development sets forth the central aims and objectives for the development cooperation of the EU and its Member States, *European Union, The European Consensus on Development, 2005*
([33]) European Council, Council Conclusions, *Guidelines for EU participation in the International Conference on Financing for Development* (Doha, 29 November to 2 December 2008), 15480/08, 2008.
([34]) UNDP, *Towards Human Resilience: Sustaining MDG Progress in an Age of Economic Uncertainty*, 2011, p. 146.

Figure 9.7: Official development assistance, by income group, EU-15
(EUR million; at current values)



NB: 'Unallocated' refers to ODA disbursed at regional, rather than country level.

Source: OECD, Eurostat (online data code: tsdgp330)

Some low-income countries have 'graduated' to become middle-income countries

An additional factor that should be taken into consideration when analysing the level of aid to LDCs and OLICs in comparison to higher income countries is the graduation of countries to LMIC and UMIC status. Between 2000 and 2010, 26 least-developed and other low-income countries graduated to lower- or upper-middle-income status. It has been argued that for this reason, a higher proportion of the world's poor now live in LMICs and UMICs, not LDCs ([35]). The exact numbers of poor people living in LMICs and UMICs require further analysis; however, to monitor the impact of ODA on poverty, and indeed on inequality, additional or new indicators may be necessary.

*'**Graduation**' of developing country from one category to another (for example from LMIC to UMIC) is the term used by the OECD and other organisations when a country's economic status has improved enough to meet the criteria of a different category.*

What lies beneath this indicator?

ODA may help recipient countries to achieve important sustainable development targets, such as the Millennium Development Goals (MDGs). However, progress towards sustainable development depends on how and for which objectives the funds are spent. Because of their vulnerability, least developed countries and other low income countries are among the EU priorities regarding ODA spending.

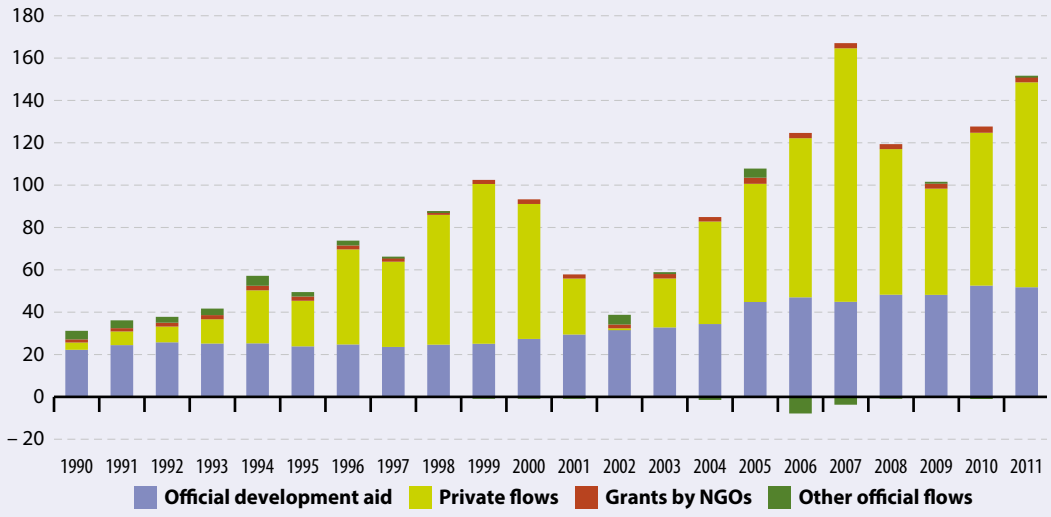
ODA consists of grants or loans provided by states with the objective of promoting economic development and welfare in recipient countries. ODA is defined here as net bilateral and imputed multilateral disbursements at market prices for ODA to countries on the OECD Development Assistance Committee's list of ODA beneficiaries. On this list, countries are classified by their income level. Countries are considered 'least-developed' depending on their three-year average estimate of the gross national income per capita, weak human assets, as measured through a composite Human Assets Index, and economic vulnerability measured through a composite Economic Vulnerability Index ([36]).

([35]) Sumner, Andy, Institute for Development Studies, *Poverty in Middle-Income Countries*, 2011, p. 2–3.
([36]) For details of the classification, see UNCTAD, *Research and Policy Analysis on LDCs.*

Financing for developing countries

4.6 % average annual growth in financing for developing countries from the EU-15 between 2000 and 2011. However, public funding has only seen a modest increase and fluctuating private finance may contribute to economic uncertainty in recipient countries

Figure 9.8: Financing for developing countries, by type, EU-15
(EUR 1 000 million; at current values)



Source: OECD, Eurostat (online data code: tsdgp310)

Total EU-15 ([37]) financing for developing countries, comprising flows from the public and private sector, was EUR 151 679 million in 2011. This corresponds to an annual average increase of 4.6 % between 2000 and 2011. In the decade 1990 to 2000 the average annual growth had been 11.5 %. Thus, financial flows to developing countries grew more slowly than in the previous decade.

The category that grew most strongly in absolute terms was private flows, which grew by EUR 33 050 million between 2000 and 2011. The second largest absolute increase came from ODA which increased by EUR 24 401 million between 2000 and 2011. From 2000 to 2011 private financing through non-governmental organisations (NGOs) grew by EUR 727 million.

The global economic crisis had a marked impact on private finance for development

In 2010 overall EU-15 financing for development was just 77.6 % of what it had been in 2007, the year before the onset of the financial crisis. While ODA remained relatively stable, the impact on financing for development was mainly due to private sector finance to developing countries, which decreased by almost 40 % between 2007 and 2010. Private flows to developing countries have not again hit the peak figure of EUR 119 727 million reached in 2007, but are on the increase again making a jump of 43.9 % from EUR 50 157 million to EUR 72 191 million between 2009 and 2010. Although this is promising, these fluctuations can create an unpredictable financial environment for developing countries that are particularly reliant on external financial support ([38]).

([37]) Data on bilateral aid is only available for the EU-15 countries.
([38]) Massa, Isabella, Jodie Keane and Jane Kennan, *The euro zone crisis and developing countries*, ODI Working Paper 345, 2012.

Box 9.1 Money sent by migrants to their families and domestic finance: key sources of finance for developing countries

In addition to the sources of financing for developing countries shown in Figure 9.8, remittances are another important flow of resources to developing countries ([39]). Remittances are relatively small sums of money transferred by migrants to their families in their country of origin. In 2011, remittances from the EU amounted to EUR 3 920 million of which 73 % went to countries outside the EU-27 ([40]).

The full scale of these financial flows may in fact be significantly higher, as transactions carried out through informal, unrecorded channels are not captured by official data and some Member States do not report data on remittances at all ([41]). Although it is difficult to measure the precise impact of remittances, it is clear they play an important role in reducing vulnerability of household income as well as the incidence and severity of poverty. Furthermore, remittances can contribute to increased household investments in education and health ([42]). The EU recognises the financial and developmental impact of remittances for developing countries for example through the European Council conclusions on the 'Global approach to migration and mobility', affirming 'the need to ensure faster, easier and cheaper remittance transfers and enhance the impact on development of social and financial remittances while ensuring coherence with other development priorities' ([43]). The G20 members have committed themselves to reduce the cost of transferring remittances from 10 % to 5 % by 2014.

In addition to providing external financial support, the EU and other members of the international community are also promoting domestic revenue generation within developing countries. By encouraging developing countries to improve government revenue collection, the donor community hopes that the level of domestic funding for development could be significantly improved. To support this action, the Communication on 'Improving EU Support to Developing Countries in mobilising Financing for Development' proposes that '...the EU should continue to increase its support to strengthen the capacity of tax systems in line with the three principles of Good Governance in the tax area (transparency, exchange of information and fair tax competition) and public financial management' ([44]).

What lies beneath this indicator?

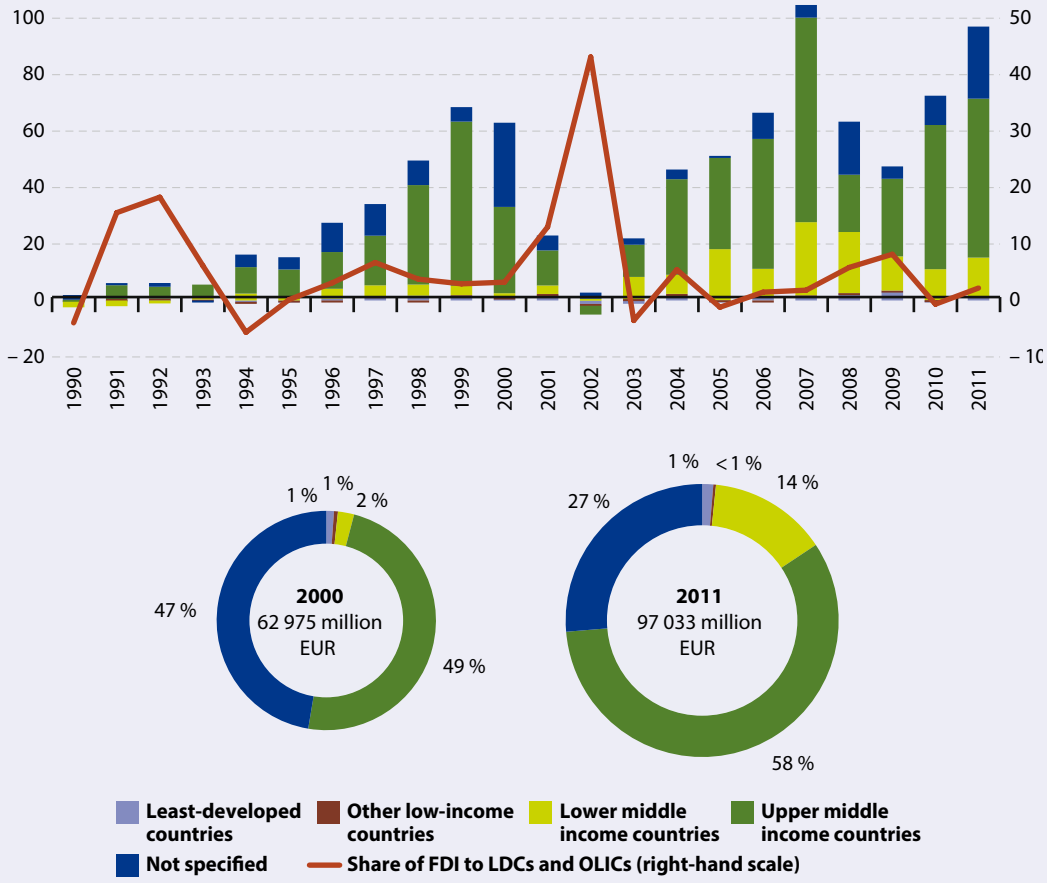
Total external financing for development comprises net disbursements of ODA, other official flows (OOF), private flows (mainly foreign direct investment, (FDI) and grants by NGOs. ODA consists of grants or loans that are undertaken by the official sector with the main objective of promoting economic development and welfare in the recipient countries. Private flows include direct investment, bonds, export credits and multilateral private flows. OOF are transactions which do not meet the conditions for eligibility as ODA, either because they are not primarily aimed at development, or because they have a grant element of less than 25 %. Grants by national NGOs consists of funds for development assistance and relief, together with any additional contributions in kind, including, for instance proceeds from charity Christmas card sales or special appeals (for example for disaster relief).

([39]) Massa, Isabella, Jodie Keane and Jane Kennan, *The euro zone crisis and developing countries,* ODI Working Paper 345, 2012, p.3
([40]) European Commission, Commission Staff Working Document, *EU Accountability Report 2013 on Financing for Development Review of progress by the EU and its Member States*, SWD(2013) 273, 2013, p. 51–52
([41]) Council of the European Union, *Conclusions on the Global Approach to Migration and Mobility, 9417/12*, 3 May 2012
([42]) World Bank, *Global Economic Prospects 2006: Economic Implications of Remittances and Migration*, 2006. p. 13
([43]) Council of the European Union, *Conclusions on the Global Approach to Migration and Mobility*, 9417/12, 3 May 2012
([44]) European Commission, Communication, *Improving EU support to developing countries in mobilising Financing for Development*, 2012.

Share of foreign direct investment in low-income countries

One percentage point drop in the share of the EU's foreign direct investment to low-income countries between 2000 and 2011. Greater effort is needed to increase the share apportioned to low-income countries and to reduce economic uncertainty

Figure 9.9: Foreign direct investment in developing countries, by income group, EU-15
(EUR 1 000 million and %; at current values)



Source: OECD, Eurostat (online data code: tsdgp320)

Foreign direct investment (FDI) is expected to confer large potential direct and indirect economic benefits for developing countries. This is especially the case for least-developed and other low-income countries where FDI is often a major contributor to capital formation ([45]). European investors account for the largest share of FDI flows from developed countries to least-developed countries (LDCs), with about 20–30 % of the world total ([46]). However, from 2000 to 2011 FDI in low-income countries decreased by 3.4 % per year on average. In 2000 the share of low-income countries of the total FDI to developing countries was 3.2 %; in 2011 it had reduced to 2.2 %.

([45]) Dabla-Norris, Era, Jiro Honda, Amina Lahreche, and Geneviève Verdier, *FDI Flows to Low-Income Countries: Global Drivers and Growth Implications. IMF Working Paper*, June 2010 and Massa, Isabella, Jodie Keane and Jane Kennan (2012) *The euro zone crisis and developing countries, ODI Working Paper 345*, 2012.
([46]) Ibid. Massa et al.

Fluctuating foreign direct investment may affect economic stability in low income countries

For LDCs, FDI figures fluctuated considerably over the years; FDI from the EU-15 to these countries ranged in the decade 2000 to 2010 from a low of EUR 1 220 million in 2002 to a high of EUR 3 184.4 million in 2009. Such declines in FDI flows, for example as a result of the euro zone crisis, are a particular concern for low-income countries. FDI flows to other low-income countries (OLICs) ([47]) also vary considerably. FDI flows to OLICs rose and fell across the decade 2000 to 2010, but sank to negative values in two years and hit a low of EUR – 653.7 million in 2002. While the percentage of FDI in LDCs and OLICs increased in 2008, the total level of FDI flows to developing countries from the EU-15 declined overall in reflection of the global economic crisis. In LDCs where dependence on FDI can be particularly high, such strong fluctuations in FDI may increase economic uncertainty and reduce the capacity of governments to plan for development.

What lies beneath this indicator?

Crucial to the success of developing countries is their ability to attract and retain private investment ([48]). Private capital flows constitute a vital complement to development efforts. The Monterrey Consensus and the Doha Declaration on Financing for Development stipulate that they should be increased ([49]).

The indicator shows the amount of foreign direct investment (FDI) made by EU enterprises in developing countries, broken down by income group of countries. Developing countries are here identified with the list of countries and territories eligible to receive official development aid/assistance (ODA), as determined by the OECD Development Assistance Committee (DAC). The indicator does do not tell us to what extent the distribution of income generated by these flows benefits the population at large, or whether their use respects social and environmental standards.

Negative foreign directive investment (FDI) values *indicate where outflows of investment exceed inflows. This may indicate, for example, disinvestment, or reinvestment outside the country, discharges of liabilities, advance and redemption of inter-company loans, short-term credit movements, company dividends exceeding recorded income over a given period or company operations being at a loss.*

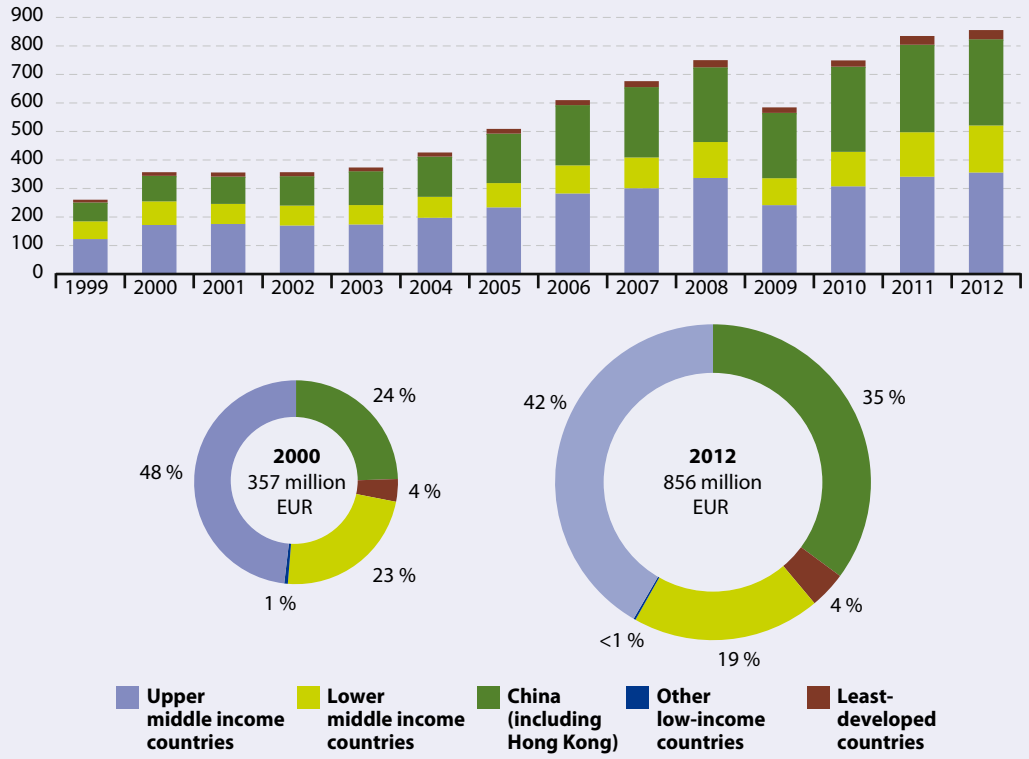
Foreign direct investment (FDI) *is an international investment where an enterprise from one country owns 10 % or more in an enterprise in another country.*

([47]) For the purposes of 2013 aid flows, the DAC List of ODA Recipients defines Other Low-Income Countries (OLICs) as countries which in 2010 had a per capita GNI of less than or equal to USD 1 005.
([48]) European Commission, *Increasing the impact of EU Development Policy: an Agenda for Change*, COM(2011) 637 final, 2011.
([49]) United Nations, *Monterrey Consensus on Financing for Development*, 2002.

Imports from developing countries

7.8 % annual increase in EU imports from developing countries between 2000 and 2012. Growing share of China imports main driver behind the increase

Figure 9.10: EU imports from developing countries by income group, EU-27
(EUR 1 000 million; at current values)



Source: Eurostat (online data code: tsdgp210)

Between 2000 and 2012 EU imports from developing countries more than doubled, from EUR 344 400 million in 2000 to EUR 845 200 million in 2012.

Growing imports from China are a decisive factor behind this increase; their share in total EU imports from developing countries increased from 24 % in 2000 to 35 % in 2012. In absolute terms, the volume of imports from China in 2012 was more than three times the volume recorded in 2000. In 2012, China was the country with most imports to the EU, followed by the US and Russia. Other developing countries among the 10 biggest EU importers were Turkey, Brazil and India.

Between 2001 and 2012 the share of EU imports from developing countries in total EU imports also increased, from 35.2 % in 2001 to 47.2 % in 2012. Imports from developing countries thus increased more strongly than total EU imports over that period; while the average annual growth rate was 8.5 % for imports from developing countries, the rate was only 5.7 % for imports from all countries.

Growing, but still low share of EU imports from least-developed countries

Between 2000 and 2012 there was a 2.8 % annual increase in EU imports from least-developed countries (LDCs). This indicates progress towards the objective of increasing the share of imports from the poorest countries of the world. However, the overall share of imports from these countries in total EU imports remains below 2 %. Moreover, the average annual growth rate of EU imports from least-developed countries was only about a third of the growth rate for EU imports from all developing countries.

Diverse imports from developing countries

The EU imports a range of products from developing countries. In 2012, 5 % of EU imports originating from these countries were raw materials, 6.4 % were food, drinks and tobacco, 23.6 % were mineral fuels, lubricants and related materials manufactured goods and 56.8 % were manufactured goods.

Between 2000 and 2012 the strongest annual growth rate was in the category of mineral fuels, lubricants and related materials (9.7 %), the lowest growth rate was for food, drinks and tobacco (3.4 %).

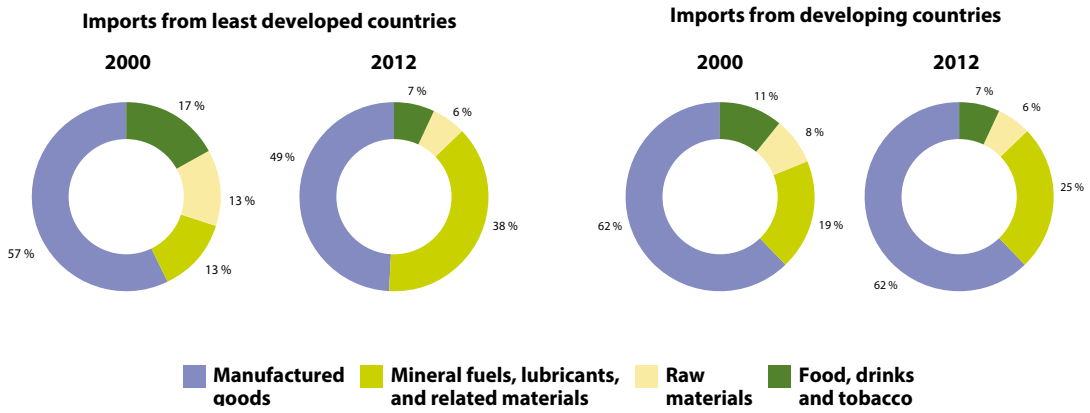
Growth in imports from LDCs highest for fuels, lubricants and related materials

In 2012, 49 % of LDC imports consisted of manufactured products, whereas the share for all developed countries was 62 %. While the share of manufactured goods in all developing countries EU imports remained the same as in 2000, the share decreased for LDCs.

The largest average annual increase among EU imports from LDCs was in the category of mineral fuels, lubricants and related materials; these grew by 18 % annually between 2000 and 2012. By contrast, a slight decrease could be observed for foods, drinks and tobacco. The largest absolute increase was also in the category of mineral fuels, lubricants and related materials where the value of imports from least-developed countries to the EU increased by EUR 10 100 million.

Least-developed countries overall continue to depend on exports of a few primary commodities, making them vulnerable to volatile world market prices ([50]).

Figure 9.11: EU imports from developing countries and from least-developed countries, by group of products, EU-27
(%)



Source: Eurostat (online data codes: tsdgp220 and tsdgp230)

The EU has reduced trade-related subsidies for agriculture

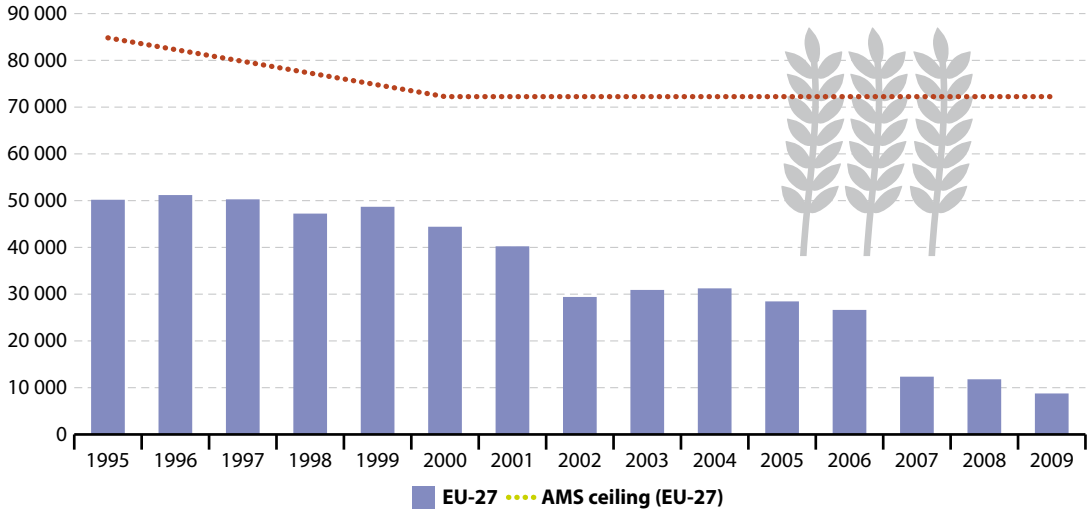
Another important way of measuring EU progress towards sustainable development in the area of trade is by looking at the extent to which EU trade policies are coherent with sustainable development goals. The EU has committed to the objective of policy coherence in the area of development policy, an objective enshrined in the Treaty on the Functioning of the European Union ([51]).

Among the EU policies that create a negative effect on developing countries are agricultural subsidies. Such subsidies make EU agricultural products cheaper and thus make it harder for producers from developing countries to compete with EU producers in agricultural markets.

([50]) Overseas Development Institute (ODI), German Development Institute/Deutsches Institut für Entwicklungspolitik (DIE), European Centre for Development Policy Management (ECDPM), European Report on Development, *Post-2015: Global Action for an Inclusive and Sustainable Future*, 2013, p. 150.
([51]) Consolidated version of the Treaty on the Functioning of the European Union, Art. 208, 2012.

Between 2000 and 2009 those EU subsidies for agriculture classified by the World Trade Organization (WTO) as 'trade-distorting' decreased from EUR 44 400 million to EUR 8 800 million, showing a positive trend in terms of sustainable development. The EU's subsidies were continuously below the ceiling to which the EU committed in WTO negotiations. However, other EU agricultural subsidies not included in this calculation may also make it harder for developing countries to compete with EU producers ([52]).

Figure 9.12: Aggregated measurement of support for agriculture, EU-27
(EUR million; at current values)



Source: EU Commission services, World Trade Organisation, Eurostat (online data code: tsdgp240)

What lies beneath this indicator?

The potential contribution of trade to sustainable development has long been acknowledged. In 2010, the EU Commission adopted a work programme on policy coherence for development; trade and finance is one of the areas specifically mentioned therein.

Various international declarations emphasise the importance of a greater share in world trade for developing countries, including the Doha Declaration on Financing for Development and the Rio+20 final declaration 'The future we want' ([53]).

This indicator is defined as the value at current prices of EU imports from the countries on the DAC list of ODA beneficiaries; these countries are also referred to as 'developing countries' in this section. The indicator is broken down by income groups of countries following the World Bank definition which classifies developing countries by their gross national income (GNI) per capita ([54]). Countries are classified by the UN as least-developed depending on their three-year average estimate of the gross national income per capita, weak human assets, as measured through a composite Human Assets Index, and economic vulnerability measured through a composite Economic Vulnerability Index ([55]). The indicator also provides information about the type of products, which help understand the overall trends related to the export base of least-developed countries. The list of ODA beneficiaries for 2012–2013 has been used throughout the time series.

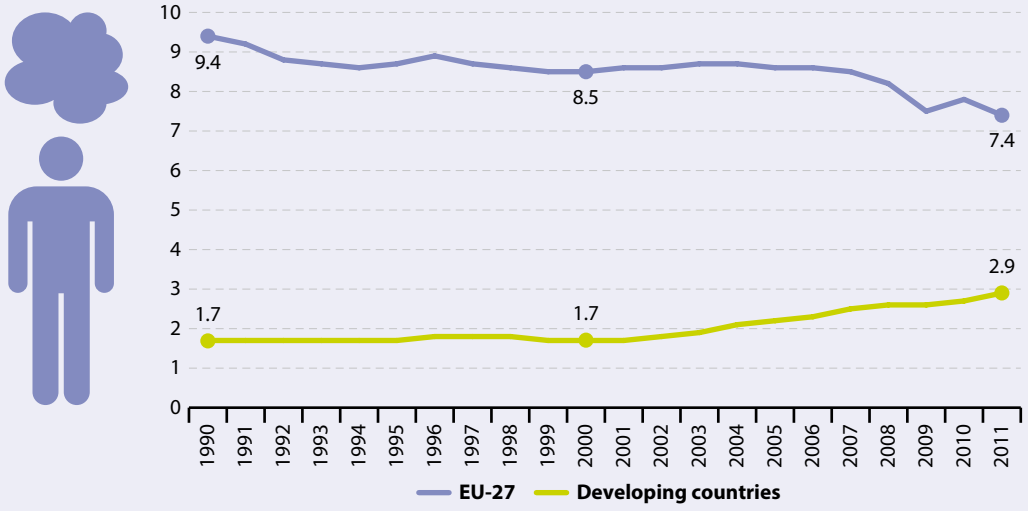
EU import statistics indicate to what extent developing countries can access the EU market, but provide no measure of the use of environmentally and socially sustainable modes of production in developing countries or the overall effects of trade on sustainable development in the exporting countries.

([52]) United Nations Conference on Trade And Development (UNCTAD), *Green Box Subsidies: A Theoretical and Empirical Assessment*, 2007.
([53]) United Nations, Resolution adopted by the General Assembly, 66/288, *The future we want,* 11 September 2012, paras. 281f.
([54]) For details, see World Bank, *How we Classify Countries*.
([55]) For details of the classification, see UNCTAD, Research and Policy Analysis on LDCs.

CO_2 emissions per inhabitant

2.6 times higher CO_2 emissions per EU inhabitant as compared with developing country inhabitants in 2011. The gap between the EU and developing countries narrowed between 2000 and 2011, but primarily due to increasing emissions from developing countries.

Figure 9.13: CO_2 emissions per inhabitant in the EU and in developing countries
(tonnes per inhabitant)



Source: Eurostat (online data code: tsdgp410)

In 2000, CO_2 emissions per inhabitant in the EU were five times higher than in developing countries. Since 2004 this gap has steadily narrowed: emissions have grown in developing countries, while they have decreased in the EU. Nevertheless, the difference in absolute terms remains high. In 2011, the EU emissions stood at 7.4 tonnes per capita; this is about 2.6 times higher than the developing country average of 2.9 tonnes per capita.

The economic crisis led to lower EU per capita CO_2 emissions but change in developing countries is less visible

During the 1990s, CO_2 emissions per inhabitant in the EU decreased on average by 1 % per year, from 9.4 tonnes in 1990 to 8.5 tonnes in 2000. Emissions remained relatively stable during the 2000s, dipping to 7.5 tonnes in 2009 as a result of the economic crisis. The figures for 2010 show an upward turn in CO_2 emissions for the EU, followed by another fall in 2011. Thus it is not yet possible to determine in which direction the overall trend is now headed.

CO_2 emissions per inhabitant in developing countries remained stable between 1990 and 2000 at around 1.7 tonnes. Between 2000 and 2011 emissions increased to 2.9 tonnes per inhabitant, representing a total increase of about 70 % for this period. The decreases in the EU's CO_2 emissions in 2009 and 2011 are not mirrored by developing countries, which show a steady increase. The increase in per inhabitant CO_2 emissions is mostly related to the rapid economic growth of major developing countries, namely China, Brazil and India. This is, however, in part offset by population growth in these countries.

What lies beneath this indicator?

One of the objectives of the renewed EU Sustainable Development Strategy is to 'contribute to improving international environmental governance […] and to strengthening multilateral environmental agreements' ([56]). The 2009 Review of the EU SDS ([57]) and the European Consensus on Development also include this objective, the latter specifying that 'with regard to climate change, the Community will focus its efforts on the implementation of the EU action plan on climate change in the context of development cooperation' ([58]). The EU provides funding for environmental action in developing countries, for example through its 'Thematic programme on environment and sustainable management of natural resources, including energy' (ENRTP) ([59]).

To mitigate climate change, emissions of greenhouse gases, notably CO_2, must be reduced. CO_2 emissions per inhabitant is therefore one of the indicators used to monitor progress towards the Millennium Development Goal 7 ('ensure environmental sustainability').

For EU Member States this indicator is compiled using the data on CO_2 emissions (sector 1–7 excluding sector 5 — land use change and forestry) provided in the official submission of the European Commission to the United Nations Framework Convention on Climate Change (UNFCCC); and per capita emissions are calculated using Eurostat population statistics. For developing countries this indicator is compiled using fuel-combustion-related CO_2 emissions published by the International Energy Agency (IEA) and per capita emissions calculated using population statistics published by the IEA. Developing countries are here identified with the 'developing countries and territories' on the OECD Development Assistance Committee List of Aid Recipients for which CO_2 emission data are available.

([56]) The Council of the European Union, *Review of the EU Sustainable Development Strategy (EU SDS) – Renewed Strategy*, 26 June 2006
([57]) European Commission, *Mainstreaming sustainable development into EU policies: 2009 Review of the European Union Strategy for Sustainable Development*, COM(2009) 400, 2009.
([58]) European Union, *The European Consensus on Development*, 2005, para. 76
([59]) European Commission, *External Action: Thematic Programme for Environment and Sustainable Management of Natural Resources, including Energy* COM(2006) 20, 2006.

10

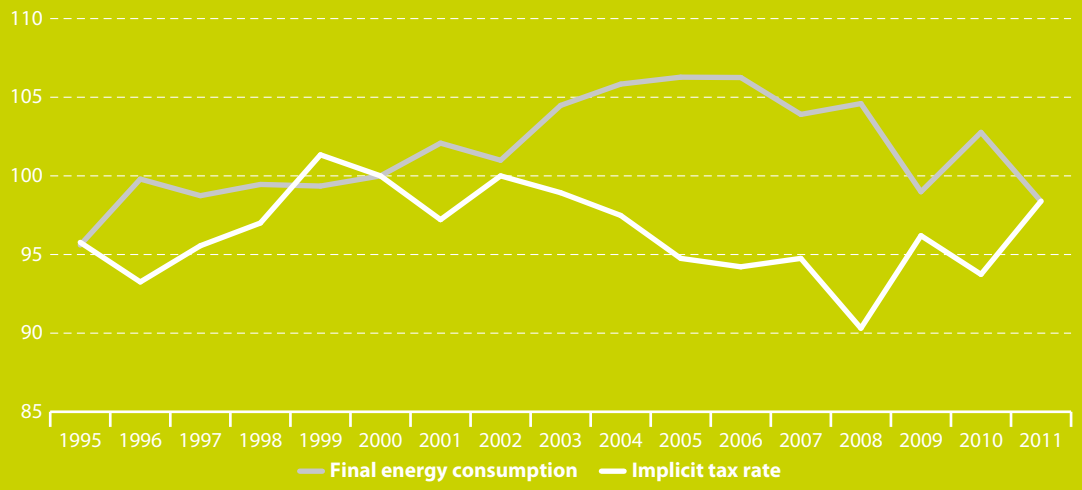
Good governance

Good governance seen through the lens of the Green Economy

Greening taxation as a means for jobs creation and stimulating innovation

Environmental taxes can change behaviour, encouraging consumers to redirect their consumption towards less taxed commodities. Not only can this contribute to achieving environmental objectives, it can also help raise revenues. According to literature, environmental taxes also have a less negative effect on GDP compared to other types of taxes, such as direct taxes (for example income tax) or indirect taxes (for example value added tax). This crucial feature of environmental taxes means countries could use them to support either fiscal consolidation or to reduce other taxes. In addition, the incentives from environmental taxes are expected to create both low and highly skilled jobs, for example in the recycling and energy efficiency sectors ([1]).

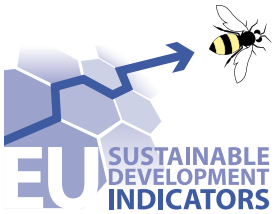
Implicit tax rate on energy, EU-27
(index 2000 = 100)



Source: Eurostat (online data codes: tsdcc360 and tsdpc320)

Energy taxes are the major part of environmental taxes, accounting for almost three quarters of environmental taxes in 2011. The implicit tax rate on energy (ITR) is measured as ratio of energy tax revenues to final energy consumption and represents the effective tax burden on energy. In 2000, the ITR in the EU as a whole was EUR 186.8 per tonne of oil equivalent (TOE). Until the onset of the economic crisis the ITR fell to a low of EUR 168.7 per TOE in 2008, only to climb to EUR 183.8 per TOE by 2011. The increase over 2008 to 2011 occurred against the backdrop of strong falls in final energy consumption spurred by the impacts of the economic crisis. Across the EU, the ITR varied considerably in 2011, from more than EUR 300 per TOE in Denmark to less than EUR 50 per TOE in Slovakia.

([1]) European Environment Agency, *Green fiscal reform can create jobs and stimulate innovation across the EU* (accessed 4 December 2013).



Overview of main changes

The trends observed in the good governance theme since 2000 have been mixed. There have been favourable trends as regards new infringement and the transposition deficit of EU law with respect to Single Market rules. In addition, citizens increasingly interact with public authorities over the internet. Some unfavourable trends, however, persist. Voter turnout in national parliamentary elections continues to decline, and a general shift from labour to environmental taxes, as called for in the EU Sustainable Development Strategy and more recently in the Europe 2020 strategy, has not been achieved.

Table 10.1: Evaluation of changes in the good governance theme (EU-27, from 2000) (1)(2)

Level 1	Level 2	Level 3
	Policy coherence and effectiveness	
	Infringement cases (*)	: Citizens' confidence in EU institutions
		Transposition deficit of EU law
	Openness and participation	
	Voter turnout	Citizens' online interaction with public authorities (**)
	Economic instruments	
	Environmental taxes compared to labour taxes	

(*) From 2007 (**) From 2008

(1) An explanation of the evaluation method and the meaning of the weather symbols is given in the introduction.
(2) The chapter contains no headline indicator because none was judged robust and policy-relevant enough to provide a comprehensive overview of the good governance concept.

Good governance seen through the lens of Quality of Life

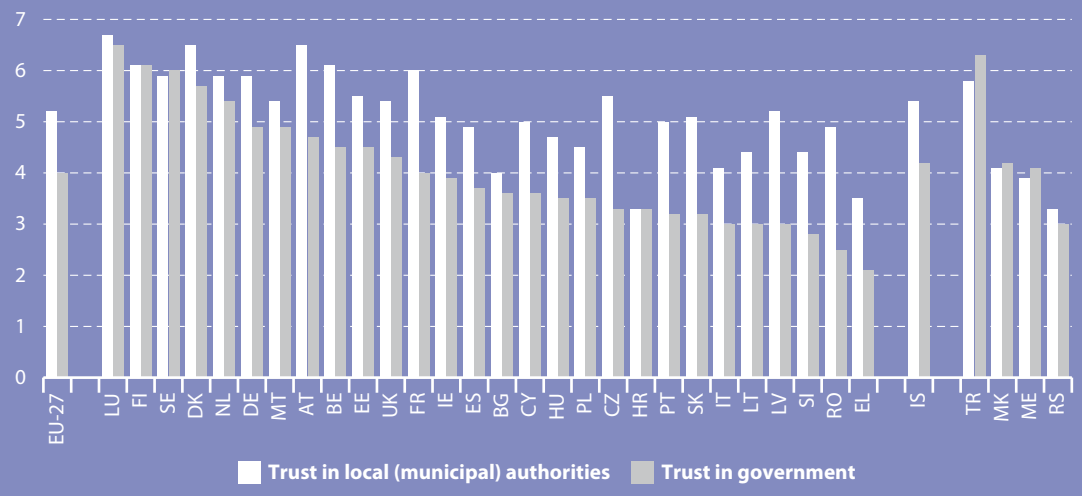
Most Europeans trust less in government than in local authorities

Trust in institutions affects not only individual's subjective well-being, but also the overall functioning of a democratic system though the effectiveness of policy initiatives, tax contributions, participation in and fair use of public services.

In 2011, the government received overall lower scores in trust compared to local and municipal authorities both at EU and national level. Trust in national institutions was highest in Luxembourg (6.5), Finland (6.1) and Sweden (6.0) and lowest in Greece (2.1), Romania (2.5) and Slovenia (2.8). Local authorities were trusted the most in Luxembourg (6.7), Denmark (6.5) and Austria (6.5) and less in most countries that joined the EU in 2004 and 2007. Notable exceptions are Malta and Estonia with trust levels above the EU average both for national and local institutions.

The low levels of trust in national political institutions might partly be affected by the extent to which countries managed to sustain the effects of the economic crises. On the other hand, the high level of trust in local authorities, which is especially pronounced in rural areas, might reflect the ease of approaching and interacting with this branch of public institutions.

Trust in government and local (municipal) authorities, by country, 2011
(mean of scores, scale 1–10)



Source: European Quality of Life Survey

Why do we deal with good governance?

The objective of sustainable development (especially the balancing of environmental, economic and social objectives) poses significant challenges for government bodies which were originally established to address sectoral concerns. The challenges associated with sustainable development are interdependent and integrated and thus require 'comprehensive approaches and popular participation' ([3]). The EU Sustainable Development Strategy, as the EU's main policy document for strategic and integrated decision-making, contains principles for governance that reflect governance processes in Europe (see box below).

The link between governance and sustainable development is thus fundamental and was already addressed in the Brundtland Report of 1987. Generally, governance refers to the steering of societal processes by governing procedures and institutions in a democratic manner. 'Good governance' is a specifically normative usage that prescribes certain steering procedures and institutions — based on principles, values and norms, such as participation, transparency and rule of law — that should be adopted to achieve preferred outcomes. The EU has addressed good governance in its White Paper on European Governance (see box below), defining five principles for application and designating the concept a normative standard for the EU's policy processes. That governance mechanisms are crucial for sustainable development has also been widely acknowledged at UN meetings: from framing sustainable development as a governance reform in Agenda 21 in 1992 ([4]), the Johannesburg World Summit in 2002 to the Rio+20 Conference in 2012 (see box on the next page).

The good governance provisions described in the EU Sustainable Development Strategy and in the White Paper on European Governance can be crunched in three main themes:

- **Policy coherence and effectiveness** focuses on better regulation as highlighted in the EU Sustainable Development Strategy. Here some of the issues of policy relevance are 'new infringement cases' and 'transposition of EU law'. They concern mainly the vertical dimension of policy coherence, that is, the coherence between the EU and national levels. Another important issue is the 'citizens' confidence in EU institutions' because it provides information on the perception of EU institutions by EU citizens.
- **Openness and public participation** put accent on two policy guiding principles of the EU Sustainable Development Strategy, namely open and democratic society, and the involvement of citizens. Some of the main issues important for monitoring are 'voter turnout' and 'e-government usage'.
- **Economic instruments** relate to the polluter pays principle and the focus on economic instruments in the EU Sustainable Development Strategy and the Europe 2020 strategy. The monitoring of important issues like 'environmental taxes compared to labour taxes' and 'implicit tax rate on energy' allows to evaluate the EU performance in the shift of taxation from labour to environmental taxes or the so called greening of the taxation system.

Several inter-linkages are apparent within the issues covered in the good governance theme. First, confidence in the main EU institutions may affect voter turnout in EU parliamentary elections. Second, there is a link between new infringement cases brought before the Court of Justice of the European Union and the transposition of Single Market law by Member States. Third, citizens' online interactions with public authorities are linked to more open access to public authorities in general.

There is also a direct link between good governance and other sustainable development themes. The pledge for a shift of taxation from labour to environmental taxes can be linked to sustainable consumption and production (particularly to 'resources and waste' and 'consumption patterns'), climate change and energy, sustainable transport, and natural resources.

([3]) World Commission on Environment and Development, *Our Common Future,* 1987, p. 9.
([4]) United Nations, *Agenda 21: The United Nations Programme of Action from Rio*, New York, United Nations, 1992.

How does the EU tackle good governance?

The EU Sustainable Development Strategy (EU SDS) ([5]) addresses good governance in various sections, namely in the sections on policy guiding principles, better policy-making, and financing and economic instruments. Various policy guiding principles are directly related to good governance:

- **Open and democratic society**: guaranteeing citizens' rights of access to information (first pillar of the Aarhus Convention) and access to justice (third pillar of the Aarhus Convention); promoting adequate consultation and participatory channels for all interested parties and associations (second pillar of the Aarhus Convention).
- **Involvement of citizens**: enhancing the participation of citizens in decision-making; promoting education and public awareness of sustainable development; informing citizens about their impact on the environment and their options for making more sustainable choices.
- **Involvement of businesses and social partners**: enhancing the social dialogue, corporate social responsibility and private-public partnerships to foster cooperation and common responsibilities to achieve sustainable consumption and production.
- **Policy coherence and governance**: promoting coherence between all EU policies and coherence between national, regional and local actions in order to enhance their contribution to sustainable development.
- **Policy integration**: promoting the integration of economic, social and environmental policies so that they are coherent and mutually reinforce each other by making full use of instruments for better regulation, such as balanced impact assessment and stakeholder consultations.
- Make polluters pay: ensuring that prices reflect the real costs to society of consumption and production activities, and that polluters pay for the damage they cause to human health and the environment.

The Europe 2020 strategy ([6]) includes a chapter on 'stronger governance' for delivering results. Apart from designing a governance mechanism for streamlining policy objectives, it describes a multi-level governance system and responsible institutions that are need to be involved in policy delivery, including the main EU institutions (Council, Commission, Parliament); national, regional and local governments; stakeholders and civil society.

The White Paper on European Governance ([7]) includes five principles that underpin good governance:

- **Openness**: EU institutions should work more openly.
- **Participation**: the quality, relevance and effectiveness of EU policies depend on ensuring wide participation throughout the policy chain.
- **Accountability**: roles in the legislative and executive processes must be clearly defined.
- **Effectiveness**: policies must be effective and timely; delivering what is needed on the basis of clear objectives.
- **Coherence**: policies and actions must be coherent and easily understood.

Good governance in the Rio+20 outcomes document

The Rio+20 outcome document, 'The Future We Want' ([8]), includes good governance issues very prominently. It acknowledges that 'democracy, good governance and the rule of law, at the national and international levels, as well as an enabling environment, are essential for sustainable development' (para 10).

Moreover, the outcome document reflects upon effective governance at the different political levels (from global to local), including issue of policy coherence, stakeholder participation, science-policy interface, and the review of progress achieved for sustainable development (para 75 and 76 ff.).

([5]) Council of the European Union, *2009 Review of the EU Sustainable Development Strategy*, Presidency report,16818/09.
([6]) Commission communication, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final.
([7]) Commission communication, *European Governance — A white paper*, COM(2001) 428 final.
([8]) UNCSD Outcome Document, *The Future We Want*, A/CONF.216/L.1.

Further reading on good governance

Commission Report, *Aarhus Convention Implementation Report*, COM(2011)208 final of 14 April 2011

Commission Communication, *The European eGovernment Action Plan 2011–2015: Harnessing ICT to promote smart, sustainable & innovative Government*, COM(2010) 743

Commission Communication, *A Digital Agenda for Europe,* COM(2010) 245 final

European Commission, *Taxation trends in the European Union: Data for the EU Member States, Iceland and Norway*, 2013 edition, Luxembourg, Office

Report from the Commission, *29th Annual Report on Monitoring the Application of EU Law*, COM(2012) 714 final

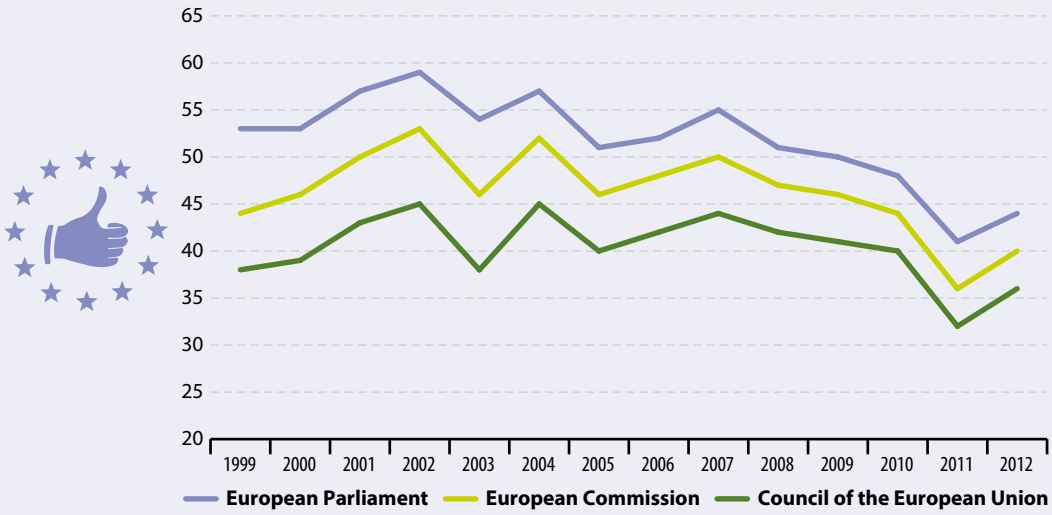
Digital Agenda Scoreboard for Europe 2012, European Commission

EEA, *Environmental tax reform in Europe: opportunities for eco-innovation*, 2011, Technical report No 17/2011

Citizens' confidence in EU institutions

44 % trust in European Parliament in 2012 keeps it the most trusted among the main EU institutions. Citizens' confidence in EU institutions remains generally low, but increased again after a historic low

Figure 10.1: Level of citizens' confidence in EU institutions, EU-27
(%)



Source: European Commission, Eurobarometer, Eurostat (online data code: tsdgo510)

In 2012, less than half of the EU citizens (44 %) said they trusted the European Parliament. However, it was still the most trusted of the three main EU institutions. Even fewer citizens said they trusted the European Commission (40 %) and the Council of the EU (36 %). Trust levels for all three institutions have declined since 2000, but increased in 2012 after reaching a low point in 2011.

Low trust levels in EU institutions matched by general lack of trust in national political institutions

EU citizens' trust in political institutions at all levels of government is generally low ([9]). EU citizens have the lowest trust in political parties (15 %), national governments (27 %) and national parliaments (28 %). They are more likely to trust regional and local authorities (43 %) and international institutions, such as the United Nations (42 %). Recent reports ([10]) show that the economic crisis and the following spending cuts ('austerity policy'), together with the way these were managed, seem to explain much of the lack of trust.

What lies beneath this indicator?

Confidence in political institutions is important for effective democracies. On the one hand, citizens' confidence increases the probability that they vote in democratic elections. On the other hand, it provides politicians and political parties with the necessary mandate to take decisions that are accepted in society.

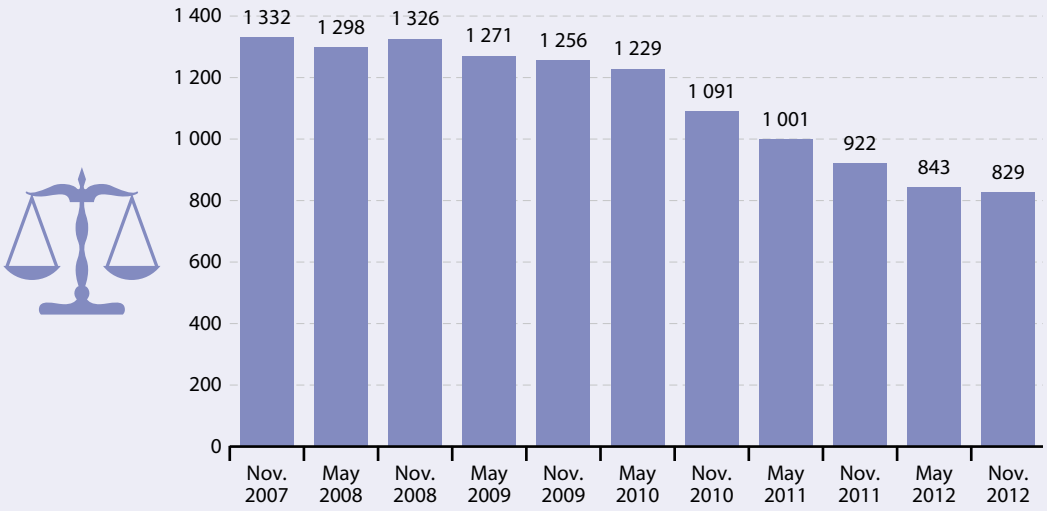
The indicator is measured by expressions of institutional 'trust' among citizens of the EU Member States. Citizens questioned expressed their confidence levels by choosing between three alternatives: 'tend to trust'; 'tend not to trust'; and 'don't know'. As 'trust' is not further specified, there is clearly room for individual interpretations.

([9]) European Commission, *Eurobarometer 78*, Brussels, 2012
([10]) European Council on Foreign Relations, *The continent-wide rise of Euroscepticism*, May 2013; and Centre for European Policy Studies, *Has the financial crisis shattered citizens' trust in national and European governmental institutions?*, CEPS Working Document No. 343, June 2011 (update)

Infringement cases

38 % drop in the number of Single Market related infringement cases in the EU between 2007 and 2012. Taxation and environmental issues make up the two largest groups of infringement cases by policy sector

Figure 10.2: Pending infringement cases, EU-27
(number)



Source: Internal Market Scoreboard No. 26, February 2013

The number of infringement cases in the EU (cases where Single Market rules are presumed to have been incorrectly applied or incorrectly transposed and where a letter of formal notice has been sent to the Member State in question) dropped considerably between 2007 and 2012. The most notable falls occurred in 2010. The decline continued in the most recent year recorded, falling by 10 % compared to November 2011.

Box 10.1: The 'EU Pilot' project to improve cooperation and early problem-solving

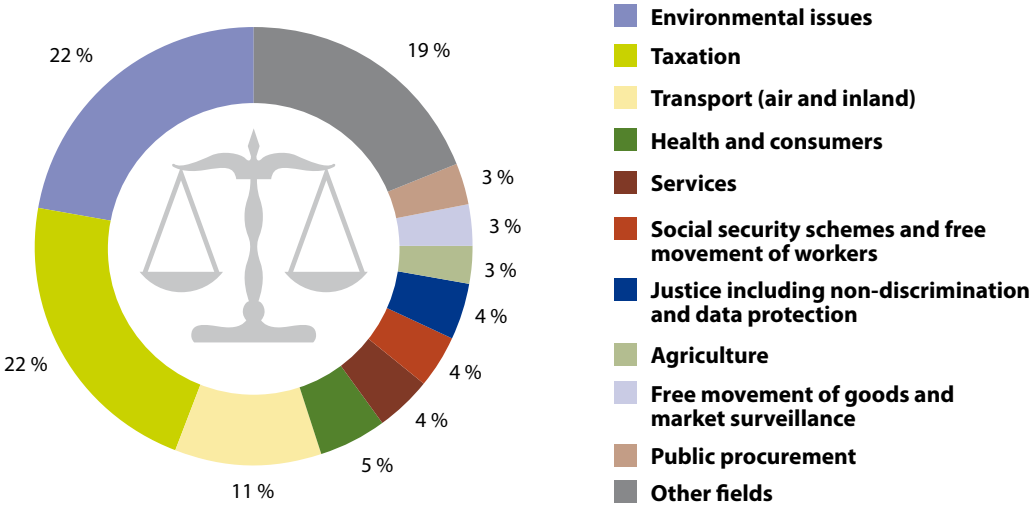
In April 2008, the Commission put the 'EU Pilot' project in place with fifteen volunteer Member States in order to enhance cooperation and early problem-solving on the application of EU law. Now the EU Pilot project applies to all Member States. In general, the EU Pilot is used as a first step to try to clarify or resolve problems, so that, if possible, formal infringement proceedings can be avoided ([1]).

Box 10.2: The SOLVIT centres

A network of national SOLVIT centres, put in place 11 years ago, seeks for a quick solution of cross-border problems faced by individuals or businesses related to bad application of Single Market rules.

([1]) See http://ec.europa.eu/internal_market/scoreboard/performance_by_governance_tool/eu_pilot/index_en.htm

Figure 10.3: Pending Single Market related infringement cases by policy area, EU-27, November 2012 (%)



Source: European Commission services, DG MARKT

Considerable differences in infringement cases between policy sectors

There are major differences among individual policy sectors. In the Single Market, the major concerns continue to be mainly in the areas of direct and indirect taxation and environment (water protection and waste management in particular), which made up 44 % of all pending infringement cases in November 2012.

What lies beneath this indicator?

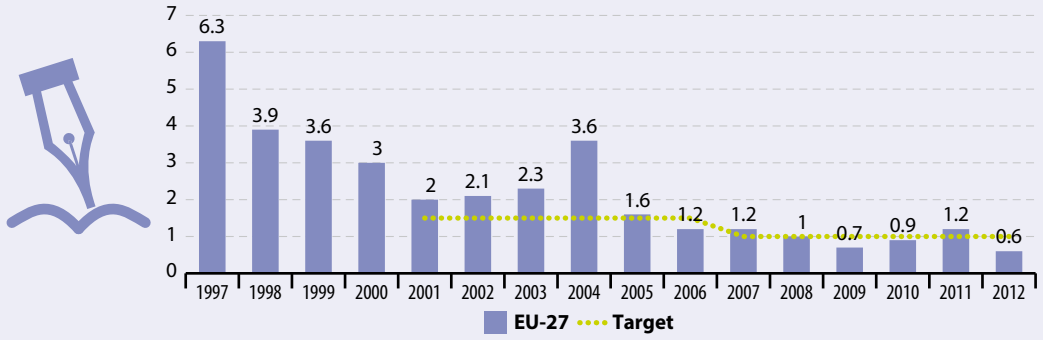
The infringement statistics highlight the infringement backlog of the various Member States, commend any efforts undertaken to improve the resolution of cases and encourage improved performances by the Member States. As guardian of the Treaties, it is the Commission's task to ensure that both Treaty provisions and acts adopted by the EU institutions are correctly implemented and applied by the Member States. If after preliminary consultations in EU Pilot, the Commission considers that EU rules are not being properly applied, it may open infringement proceedings against the Member States in question. However, only the Court of Justice can rule definitively that a breach of EU law has occurred.

The indicator provides a measure of the enactment of EU Single Market law at the national level and gives some insight into areas that cause difficulties for Member States. As one of the policy guiding principles of the EU Sustainable Development Strategy is to promote coherence at all levels of political action (i.e. policy coherence and governance) and the Europe 2020 Strategy governance process requires close coordination between the different government levels, the indicator illustrates one aspect of policy coherence between the EU and the Member States.

Transposition deficit of EU law

2.4 percentage points drop in transposition deficit of EU law in the EU between 2000 and 2012. This put the EU again below the target for transposition deficit of Single Market rules

Figure 10.4: Transposition deficit of EU Single Market law, EU-27
(%)

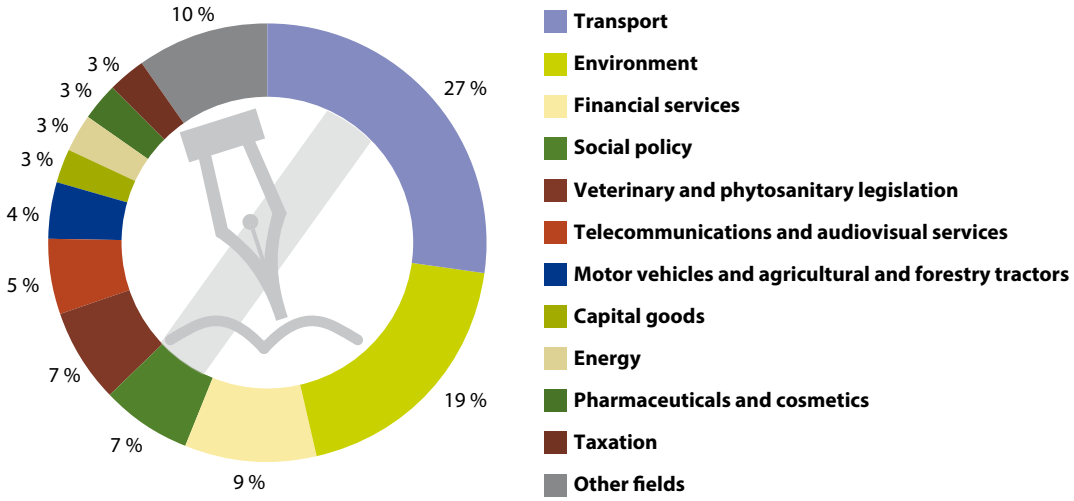


Source: Internal Market Scoreboard No.26, February 2013

Promoted by the Internal Market Scoreboard ([12]) as the 'best result ever', the EU average transposition deficit was 0.6 % in November 2012. It was therefore below the 1.0 % target set by the European Council in 2007 ([13]) and close to the 0.5 % target proposed by the European Commission in 2011 in the Single Market Act ([14]). From 1997 onwards, there has been a decreasing trend from 6.3 % to the mentioned last result of 0.6 %.

In November 2012, only four Member States (Belgium, Austria, Poland and Portugal) did not comply with the 1.0 % target established by the European Council in 2007; moreover, 13 Member States had a transposition deficit of 0.5 % or below and were thus meeting the target proposed by the European Commission in the Single Market Act in April 2011.

Figure 10.5: Incompleteness rate of EU Single Market Directives, EU-27 Directives (73) not fully notified by at least one Member State, by policy area, 2012
(%)



Source: European commission services, DG MARKT

([12]) European Commission, *Internal Market Scoreboard No. 26*, February 2013
([13]) The 2001 transposition deficit target of 1.5 % was changed to 1.0 % in 2007 to be achieved by 2009; see EU Council Conclusions March 2007, 7224/1/07 REV 1, para 9.
([14]) Communication from the Commission, *Single Market Act: Twelve levers to boost growth and strengthen confidence*, COM(2011) 206 final, p. 21

Significant differences in transposition deficit of EU law among policy areas

More than half of the transposition deficit of EU law comes from two fields, namely transport (27 %) and environment (19 %). The remaining fields contribute to this deficit with lower percentages; for example, 'financial services' has a 9 % contribution, whilst 'social policy' and 'veterinary and phytosanitary legislation' have both 7 %.

What lies beneath this indicator?

The indicator transposition deficit of EU Single Market law considers the percentage of Single Market directives that have not been yet notified (as national transposition measures) to the Commission in relation to the total number of directives – that should have been notified by the deadline. This indicator is calculated twice yearly: it takes into account all notifications by 10 May and 10 November each year for directives with a transposition deadline of 30 April or 31 October of the same year, respectively. The indicator is calculated using data extracted directly from the Single Market Scoreboard (SMS), run by DG Internal Market and Services.

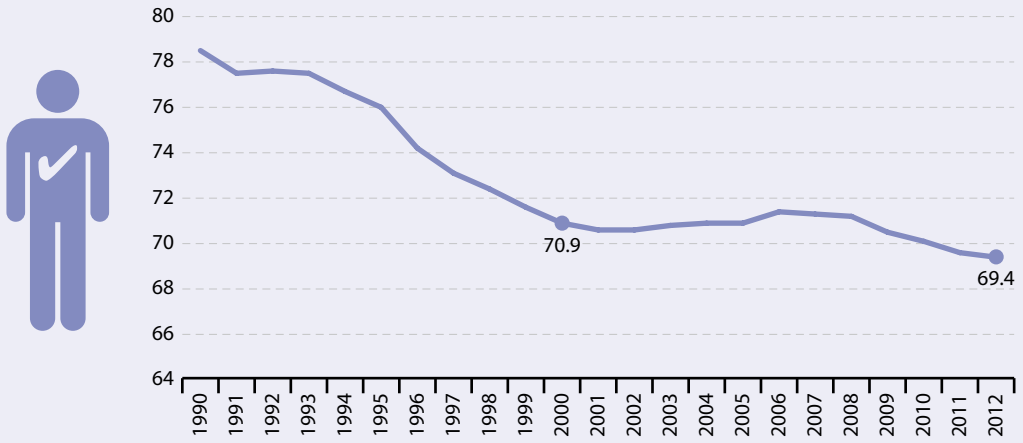
The so called 'incompleteness rate' records the percentage of outstanding directives which one or more Member States have failed to transpose in relation to the total number of Single Market directives. The consequence is that the Single Market is not a reality in the areas covered by those directives.

The indicator signals the degree of policy coherence and policy integration among all European Union policies and between national, regional and local policies.

Voter turnout

1.5 percentage points reduction of voter turnout in national parliamentary elections in the EU between 2000 and 2012. The trend from previous years remains confirmed, as the turnover of citizens casting their vote continues to slightly decrease

Figure 10.6: Voter turnout in national parliamentary elections, EU-27
(%)



NB: The calculation of the Eurostat estimate for the EU-27 aggregate level is based on voter turnout in parliamentary elections for all countries except Cyprus, France and Romania, for which presidential elections are used instead.

Source: Election Guide (CEPPS), Eurostat (online data code: tsdgo310)

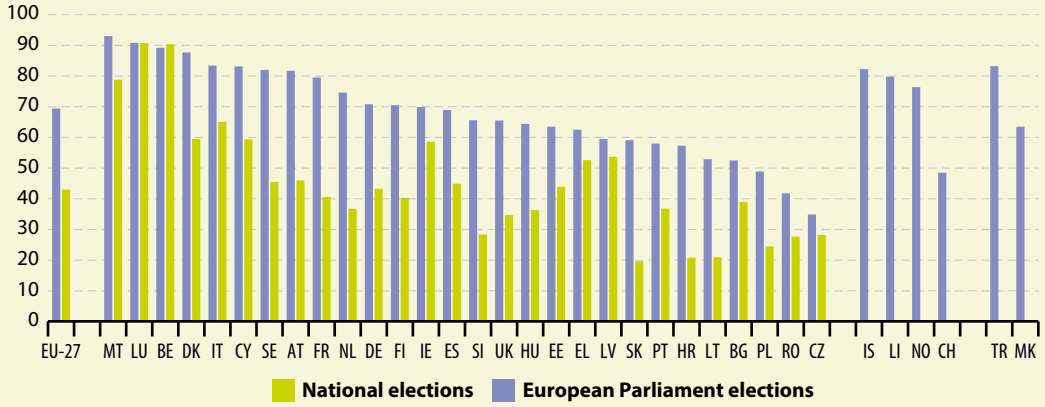
In 1990, the voter turnout in national elections was 78.5 %. In only ten years, it dropped dramatically by 7.6 percentage points, reaching 70.9 % in 2000. The trend continues with few ups and downs until 2007 when it starts suffering a slight but steady decrease. In fact, between 2007 and 2012, the voter turnout does not experience ups and downs, and slowly loses every year an average of 0.33 % over the whole period of time. However, if comparing year 2000 with 2012, the reduction of voter turnout is represented only by a slight drop of 1.5 %. Many factors influence voter turnout: among these, few seem to have more impact, such as population size and electoral closeness, a more stable population, campaign expenditures, and institutional procedures governing the course of the elections ([15]). Nevertheless, the contemporary erosion of voter turnout may be often associated with the particularly high rates of abstention of younger generations in the elections ([16]).

Only eight EU Member States with a voter turnout over 80 %

There are major differences among EU Member States participation in national elections. Only eight countries have a voter turnout over 80 %; namely these countries are Malta, Luxembourg, Belgium, Denmark, Italy, Cyprus, Sweden and Austria. A group of eleven countries follows with a percentage of voters casting their vote between 60 % and 80 %. Only three countries experienced a voter turnout smaller than half of eligible voters who actually voted in their country elections.

([15]) Geys, B., 2006, *Explaining voter turnout: A review of aggregate-level research*, Electoral Studies, vol. 25 (4), pp. 637–663
([16]) Delwit, P., 2013, *The End of Voters in Europe? Electoral Turnout in Europe since WWII*, Open Journal of Political Science, vol.3 (1), pp. 44–52.

Figure 10.7: Voter turnout in national and European parliament elections, by country
(%)



NB: The EU-27 figure for national elections is a Eurostat estimate. Data for national elections refer to the latest year in which national parliamentary elections were held. For all countries, this year lies between 2006 and June 2013.

Source: Election Guide (CEPPS), Eurostat (online data code: tsdgo310)

Much lower participation in EU parliament elections compared with national elections

The participation in EU Parliament elections is significantly lower than voter turnout in national elections. Although EU composition was completely different, a decreasing trend can be reported with regard to voter turnout in EU parliamentary elections over the past thirty years (1979 to 2009). It signals a loss of almost 20 % of EU citizen participation ([17]). In fact, on average, EU-27 voter turnout does not reach half of the eligible EU population, and is estimated at 43 % for the most recent election. In six Member States the turnout fell lower than 30 %, and in one EU country it did not even reach the 20 % threshold. However, in Belgium and Luxembourg more than 90 % of citizens casted their vote in the last two EU parliamentary elections.

The not encouraging performance of the EU parliamentary elections in comparison with the national elections may represent accordingly a second-order elections in which national issues are more salient than EU ones ([18]). It may also reflect a lack of information on EU matters among EU citizens ([19]), as well as a general perception of EU affairs not having a significant impact on national policies and personal interests.

What lies beneath this indicator?

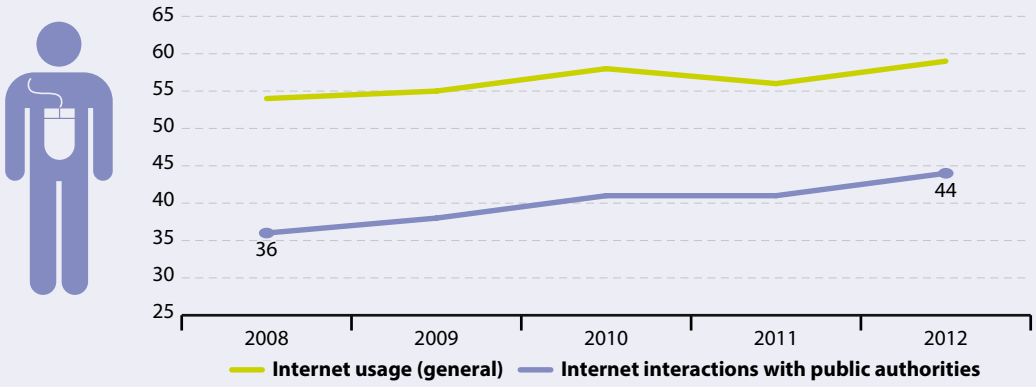
The indicator measures the number of those who cast a vote or 'turn out' at an election, including those who cast blank or invalid votes. Voter turnout in national and EU parliamentary elections is dependent on the different voting systems of the Member States: for instance, in Belgium, Luxembourg and Greece, voting is compulsory; whilst, in Italy, voting is a civic obligation. 'Voter turnout' is a key aspect indicating the degree of citizens' participation in public affairs both at EU and national levels, which has therefore the capacity of signalling the involvement of citizen in the society.

([17]) http://www.europarl.europa.eu/aboutparliament/en/000cdcd9d4/Turnout-(1979-2009).html
([18]) Schmidt, V. A., 2013, *Democracy and Legitimacy in the European Union Revisited: Input, Output and 'Throughput'*. Political Studies, 61: 2–22
([19]) Farrell, D.M. and Scully, R., 2007, *Representing Europe's citizens? Electoral institutions and the failure of parliamentary representation*, Oxford University Press, Oxford

Citizens' online interactions with public authorities

8 percentage points increase in the online interactions of citizens with public authorities in the EU between 2008 and 2012. Overall, more than 40 % of EU citizens used e-government in 2012

Figure 10.8: Individuals using the internet for interaction with public authorities, EU-27
(% of individuals aged 16 to 74)



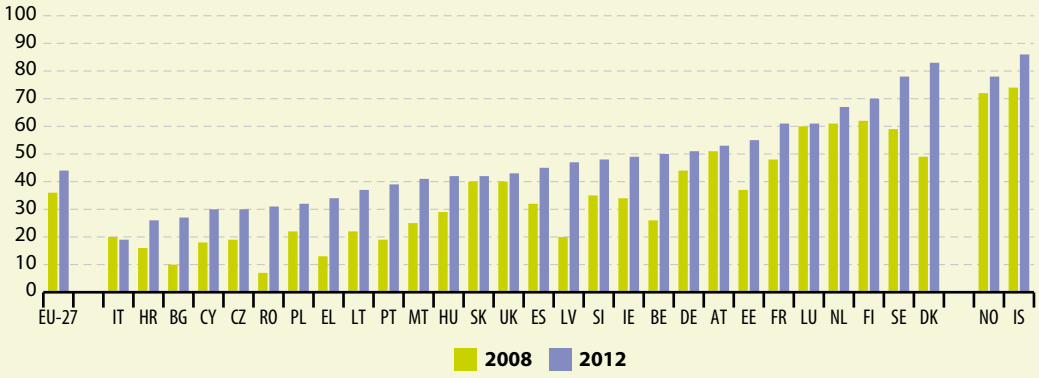
Source: Eurostat (online data code: tin00012)

In 2012, 59 % of EU citizens used the internet which marks an increase of 5 percentage points since 2008. Between 2008 and 2012 the use of the internet by EU citizens to interact with public authorities increased even more, by 8 percentage points. After a slight drop in 2011, internet interactions with public authorities grew again, reaching 44 % in 2012.

How internet interaction with public authorities varies between Member States

In 2012 internet interaction with public authorities was above 60 % in six countries (Denmark, Sweden, Finland, the Netherlands, Luxembourg and France), whereas it varied between 55 % and 19 % in the remaining Member States. Nevertheless, internet interaction with public authorities increased in all but one Member State between 2008 and 2012. The strongest increases between 2008 and 2012, however from a very low level, took place in Romania (4.4-fold increase), Bulgaria (2.7-fold), and Greece (2.6-fold).

Figure 10.9: Individuals using the Internet for interaction with public authorities, by country
(%)



NB: 2009 data for RO (instead of 2008).

Source: Eurostat (online data code: tin00012)

Differences in internet use affect e-government use across Member States

Although internet coverage of fixed broadband networks was stable in 2012 at 95.5 % of the European population ([20]), differences in regular internet use by EU citizens were substantial between the Member States. Internet usage ranged from above 80 % in Sweden and Denmark to slightly above 40 % in Croatia and the Czech Republic, with the exception of Italy (33 %).However, most of the growth in the regular use of the internet by EU citizens comes from those Member States that currently have a low level of regular internet use. Therefore, it is argued in the Digital Agenda Scoreboard 2013 that 'regular internet use continues its road to becoming the norm in Europe' ([21]).

Box 10.3: Europe 2020 flagship initiative 'A Digital Agenda for Europe'

'A Digital Agenda for Europe' is one of the Europe 2020 Strategy's flagship initiatives. The main aim is 'to deliver sustainable economic and social benefits from a digital single market based on fast and ultra-fast internet and interoperable applications.'

The Digital Agenda for Europe frames its key actions around the need to systematically tackle these seven problem areas, which as a horizontal initiative spans, the three growth dimensions set out in Europe 2020. In the action area, 'ICT-enabled benefits for EU society', the Flagship Initiative also addresses e-government issues and points out that 'European governments are committed to making user-centric, personalised, multi-platform eGovernment services a widespread reality by 2015'. Moreover, action towards the support of seamless cross-border eGovernment services in the single market is envisaged.

Administrative services are the most popular

The most popular online public services are those providing administrative services for citizens: 'declaring income taxes' (73 % of user will use the e-Channel for this service next time), 'moving/changing address within country' (57 %) and 'enrolling in higher education and/or applying for student grant' (56 %) ([22]). The most important gains for citizens when using e-government services are time and flexibility, followed by saving money and simplification of the delivery process. Apparently, service quality is less relevant to citizens ([23]). A more sophisticated use of e-government has not emerged (for example direct interaction with government officials and electronic voting) ([24]).

What lies beneath this indicator?

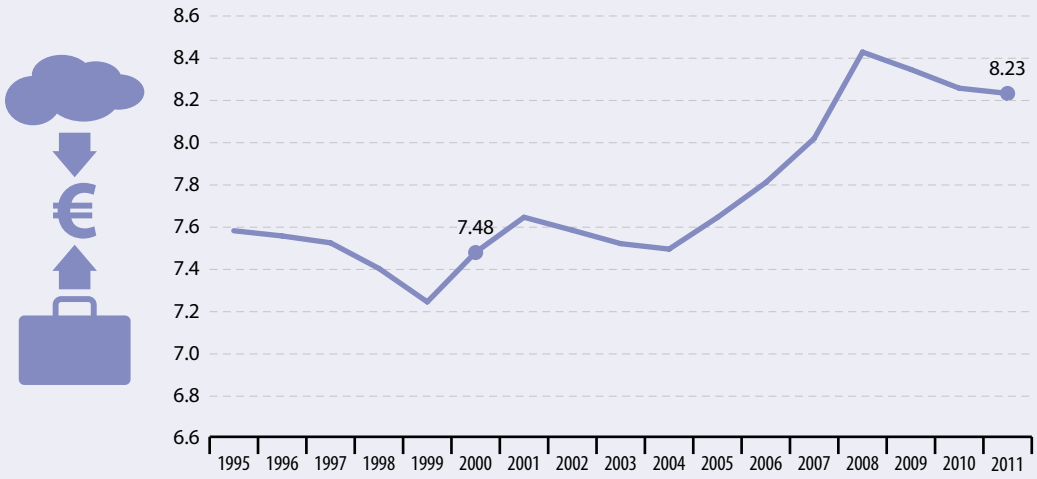
E-government is important for good governance because it potentially improves the interaction and communication between citizens and public authorities. The indicator measures the use of the internet in general as well as the use of basic online services by individuals and how they use the internet to communicate with public authorities, including for obtaining services from public authorities websites, for downloading official forms, for sending filled in forms. However, it does not provide a concrete indication of more specific 'democratic' usage of the internet (such as online discussion forums and electronic voting).

([20]) European Commission, *Digital Agenda Scoreboard 2013*, SWD(2013) 217 final
([21]) Ibid.
([22]) European Commission, *Public Services Online 'Digital by Default or by Detour?' Assessing User Centric eGovernment performance in Europe*, eGovernment Benchmark 2012
([23]) Ibid.
([24]) European Commission, *Digital Agenda for Europe Scoreboard 2012*

Environmental taxes compared to labour taxes

10.1 % increase in the ratio of labour to environmental taxes in the EU from 2000 to 2011. This trend is counter to the EU goals of shifting the tax burden from labour to energy and environmental taxes ('greening' the taxation system)

Figure 10.10: Ratio of labour to environmental taxes, EU-27
(ratio of the share of labour taxes in total revenues from taxes and social contributions to the share of environmental taxes)



Source: Eurostat (online data code: tsdgo410)

Environmental taxation has played an important role in policy debates during the current and previous economic crises. Many have argued that raising environmental taxes could create scope for labour tax cuts and deliver the double dividend of higher employment and a better environment.

In 2000 revenues from labour taxes were about 7.5 times higher than revenues from environmental taxes, while in 2011 they were more than 8.2 times higher. In fact, the share of environmental taxes in total revenues from taxes and social contributions declined over the period from 2000 to 2011, while the share of labour taxes increased. The decrease in the share of environmental taxes was substantial between 2004 and 2008, followed by a slight improvement between 2008 and 2011.

The effective tax burden on energy has fallen…

This trend is also reflected in the development of the implicit tax rate on energy (ITR). The ITR is measured as ratio of energy tax revenues to final energy consumption and represents the effective tax burden on energy ([25]). Energy taxes are the major part of environmental taxes, accounting for almost three quarters of environmental taxes in 2011 ([26]). While there was a downward trend between 2000 and 2008, with the ITR falling by 9.7 %, it increased again during the economic crisis, by almost 9 % from 2008 to 2011. This trend mainly mirrors the developments in energy consumption in the EU (see the chapter 'Sustainable consumption and production').

The fall in the implicit tax rate on energy indicates a decline in the effective tax burden on energy relative to the potentially taxable base. As with the shares of environmental taxes compared to labour taxes, this trends conflicts with the principle of shifting taxation from labour to environmental and energy taxes as included in the EU Sustainable Development Strategy and the Europe 2020 strategy.

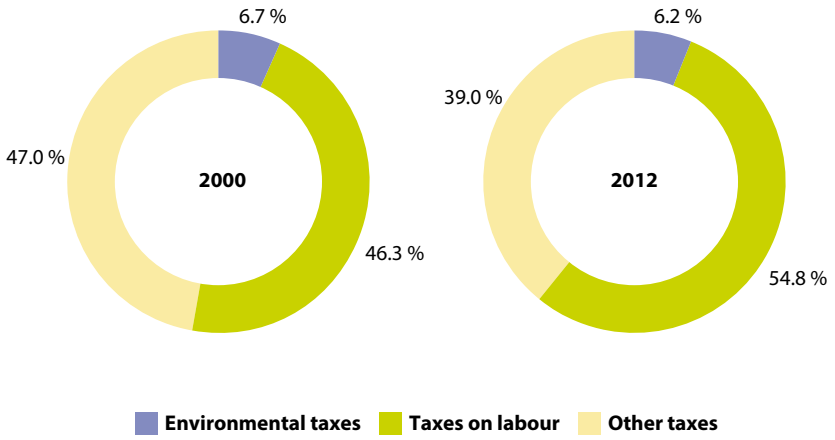
([25]) The indicator is expressed as an index. Prices are deflated. The implicit tax rate measures the average effective tax burden related to the potential taxable base.
([26]) The other parts are taxes on transport (21 % in 2011) and on pollution and resources (4 % in 2011).

… while the share of labour taxes in total revenues from taxes and social contributions has increased

The share of labour taxes in total revenues from taxes and social contributions showed a fluctuating but overall increasing trend between 2000 and 2011, reaching almost 55 % in 2011. This compares with an overall decline in the share of environmental taxes over the same period, reaching 6.17 % in 2011. This trend is counter the Europe 2020 strategy's argument that 'raising taxes on labour, as has occurred in the past at great costs to jobs, should be avoided' ([27]). Nevertheless, there are large differences in the share of labour taxation among the Member States, ranging from 33.4 % to 58.1 %.

With regards to environmental taxes, only two Member States (Bulgaria and the Netherlands) showed a share above 10 % of environmental taxes in total revenues from taxes and social contributions in 2011, and two others (Malta, Slovenia) had a share above 9 %. In the remaining Member States the share of environmental taxes ranged from 4.15 to 8.94 %.

Figure 10.11: Shares of environmental and labour taxes in total revenues from taxes and social contributions, EU-27
(%)



Source: Eurostat (online data code: tsdgo410)

What lies beneath this indicator?

One of the policy guiding principles of the EU Sustainable Development Strategy is to ensure that prices reflect the real costs of consumption and production activities to society and that polluters pay for the damage they cause to human health and the environment. More specifically, the strategy encourages Member States to consider further steps to shift taxation from labour into resource and energy consumption and/or pollution. The Europe 2020 strategy also calls for a shift from labour to energy and environmental taxes as part of a 'greening' of taxation systems.

The indicator compares the shares of environmental and labour taxes in total revenues from taxes and social contributions. Environmental taxes are defined as taxes where the tax base is a physical unit (or a proxy of a physical unit) of something that has a proven, specific negative impact on the environment and which is identified in ESA 95 ([28]) as a tax. Environmental tax revenues are of four types: energy taxes, transport taxes, pollution taxes and resource taxes.

Taxes on labour are generally defined as personal income taxes, payroll taxes and social contributions of employees and employers that are levied on labour income (both employed and non-employed).

([27]) European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020
([28]) Regulation 691/2011 on European environmental economic accounts

Annex

Annex I

Geographical aggregates and countries

EU-28 ([1]) The 28 Member States of the European Union from 1 July 2013 (BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK)

EU-27 The 27 Member States of the European Union from 1 January 2007 to 30 June 2013 (BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK)

EU-15 The 15 Member States of the European Union from 1 January 1995 to 30 April 2004 (BE, DK, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI, SE, UK)

Note that EU aggregates are back-calculated when enough information is available — for example, data relating to the EU-27 aggregate is presented where possible for periods before Bulgaria and Romania joined the EU in 2007 and the accession of ten new Member States in 2004, as if all 27 Member States had always been members of the EU. The label is changed if the data refer to another aggregate (EU-15).

European Union Member States

BE	Belgium
BG	Bulgaria
CZ	Czech Republic
DK	Denmark
DE	Germany
EE	Estonia
IE	Ireland
EL	Greece
ES	Spain
FR	France
HR	Croatia
IT	Italy
CY	Cyprus
LV	Latvia
LT	Lithuania
LU	Luxembourg
HU	Hungary
MT	Malta
NL	Netherlands
AT	Austria
PL	Poland
PT	Portugal
RO	Romania
SI	Slovenia

([1]) At the time of drafting this publication, the EU-28 aggregate (including Croatia since its accession on 1 July 2013) was not available. Therefore, only the EU-27 aggregate (referring to the situation in the EU before the accession of Croatia) is used for the analysis.

SK	Slovakia
FI	Finland
SE	Sweden
UK	United Kingdom

European Free Trade Association (EFTA)

IS	Iceland ([2])
LI	Liechtenstein
NO	Norway
CH	Switzerland

EU candidate countries

ME	Montenegro
MK	The former Yugoslav Republic of Macedonia ([3])
RS	Serbia
TR	Turkey

Countries from the rest of the world

JP	Japan
KR	South Korea
RU	Russia
US	United States

Units of measurement

%	per cent
°C	degree Celsius
:	data not available
EUR	euro
GWh	gigawatt hours
kg	kilogram
kgoe	kilograms of oil equivalent
km	kilometre
Mtoe	million tonnes of oil equivalent
pkm	passenger kilometre
Ppm	parts per million
tkm	tonne-kilometre
TOE	tonnes of oil equivalent
TWh	terawatt hours
US$	US dollar

([2]) Note that Iceland is also an EU candidate country.
([3]) The name of the former Yugoslav Republic of Macedonia is shown in tables as 'FYR Macedonia'. This does not prejudge in any way the definitive nomenclature for this country, which is to be agreed following the conclusion of negotiations currently taking place on this subject at the United Nations.

Abbreviations

AIC	Actual individual consumption
AMS	Aggregated measurement of support
AROPSE	At risk of poverty or social exclusion
CCS	Carbon capture and storage
CFP	Common Fisheries Policy
CHP	Combined heat and power
CO_2	Carbon dioxide
CSR	Corporate Social Responsibility
DAC	Development Assistance Committee
DMC	Domestic material consumption
EDP	Excessive deficit procedure
EEA	European Environment Agency
EERP	European Economic Recovery Plan
EMAS	Eco-Management and Audit Scheme
EFTA	European Free Trade Association
EQLS	European Quality of Life Survey
ERDF	European Regional Development Fund
ESD	Effort Sharing Decision
ESS	European Statistical System
ET 2020	'Education and Training 2020' Framework
EU	European Union
EU ETS	EU Emissions Trading System
EU LFS	EU Labour Force Survey
EU SDS	EU Sustainable Development Strategy
EU SILC	EU Statistics on Income and Living Conditions
FAO	UN Food and Agriculture Organization
FDI	Foreign direct investment
GDP	Gross domestic product
GE	Green economy
GHG	Greenhouse gas
GNI	Gross national income
GNP	Gross national product
HLY	Healthy life years
ICT	Information and communications technology
IEA	International Energy Agency
ILO	International Labour Organisation
IMF	International Monetary Fund

IPCC	Intergovernmental Panel on Climate Change
IRTAD	International Road Traffic Accident Database
ISCED	International Standard Classification for Education
ITR	Implicit tax rate
IUCN	International Union for Conservation of Nature
JRC	Joint Research Centre
LDCs	Least-developed countries
LLL	Lifelong learning
LMICs	Lower middle-income countries
LULUCF	Land use, land-use change and forestry
MDGs	Millennium Development Goals
MEA	Multilateral environmental agreement
MIP	Macroeconomic imbalances procedure
MSY	Maximum sustainable yield
NECD	National Emissions Ceilings Directive
NEET	Not in education, employment or training
NGOs	Non-governmental organisations
NH_3	Ammonia
NMVOC	Non-methane volatile organic compounds
NNI	Net national income
NO_2	Nitrogen dioxide
NO_X	Nitrogen oxides
NRP	National Reform Programmes
NUTS	Nomenclature of Territorial Units for Statistics
O_3	Ozone
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
OLICs	Other low-income countries
PEC	Primary energy consumption
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
PM	Particulate matter
QoL	Quality of life
OWG	Open working group
R&D	Research and development
RDI	Research and Development Initiative
RMC	Raw material consumption
RME	Raw material equivalents

RTD	Research and technological development
SCP	Stability Convergence Programmes
SD	Sustainable development
SDGs	Sustainable development goals
SDIs	Sustainable development indicators
SGP	Stability and Growth Pact
SME	Small and medium enterprises
SMS	Single Market Scoreboard
SO_2	Sulphur dioxide
SO_X	Sulphur oxides
TAC	Total allowable catch
TFC	Transferable fishing concessions
UAA	Utilised agricultural area
UMICs	Upper middle-income countries
UN	United Nations
UNCSD	United Nations Conference on Sustainable Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNGA	United Nations General Assembly
VAT	Value added tax
WCED	World Commission on Environment and Development
WHO	World Health Organization
WMO	World Meteorological Organization
WTO	World Trade Organization

Annex II

Table A.1: OECD Green growth indicators and themes

The socio-economic context and characteristics of growth	
Economic growth, productivity and competitiveness	**Economic growth and structure** GDP growth and structure; Net disposable income
	Productivity and trade Labour productivity; multi-factor productivity Trade weighted unit labour costs Relative importance of trade: (exports + imports)/GDP **Inflation and commodity prices**
Labour markets, education and income	**Labour markets** Labour force participation and unemployment rates
	Socio-demographic patterns Population growth, structure and density Life expectancy: years of healthy life at birth Income inequality: GINI coefficient Educational attainment: Level of and access to education

Group/theme	**Proposed indicators**
Environmental and resource productivity	
Carbon & energy productivity	**1. CO_2 productivity** 1.1 Production-based CO_2 productivity GDP per unit of energy-related CO_2 emitted • Demand-based CO_2 productivity Real income per unit of energy-related CO_2 emitted
	2. Energy productivity 2.1 Energy productivity (GDP per unit of TPES) • Energy intensity by sector (manufacturing, transport, households, services) • Share of renewable energy in TPES, in electricity production
Resource productivity	**3. Material productivity (non-energy)** 3.1 Demand based material productivity (comprehensive measure; original units in physical terms) related to real disposable income • Domestic material productivity (GDP/DMC) ◦ Biotic materials (food, other biomass) ◦ Abiotic materials (metallic minerals, industrial minerals) 3.2 Waste generation intensities and recovery ratios By sector, per unit of GDP or VA, per capita 3.3 Nutrient flows and balances (N,P) • Nutrient balances in agriculture (N, P) per agricultural land area and change in agricultural output
	4. Water productivity VA per unit of water consumed, by sector (for agriculture: irrigation water per hectare irrigated)
Multi-factor productivity	**5. Multi-factor productivity reflecting environmental services** Comprehensive measure
Technology and innovation	**6. R&D expenditure of importance to GG** 6.1 Renewable energy (in % of energy related R&D) 6.2 Environment-related technologies (in % of total R&D, by type) 6.3 All purpose business R&D (in % of total R&D)
	7. Patents of importance to GG in % of country applications under the Patent Cooperation Treaty 7.1 Environment-related and all-purpose patents 7.2 Structure of environment-related patents

Natural asset base	
Natural resources	**8. Index of natural resources** Comprehensive measure
Renewable stocks	**9. Freshwater resources** Available renewable resources (groundwater, surface water, national, territorial) and related abstraction rates
	10. Forest resources Area and volume of forests; stock changes over time
	11. Fish resources Proportion of fish stocks within safe biological limits (global)
Non-renewable stocks	**12. Index of natural resources** Comprehensive measure
Biodiversity and ecosystems	**13. Land resources** Land cover types, conversions and cover changes State and changes from natural state to artificial or man-made state • Land use: state and changes
	14. Soil resources Degree of top soil losses on agricultural land, other land • Agricultural land area affected by water erosion by class of erosion
	15. Wildlife resources • Trends in farmland or forest bird populations or in breeding bird populations • Species threat status: mammals, birds, fish, vascular plants in % species assessed or known • Trends in species abundance
Environmental quality of life	
Environmental health and risks	**16. Environmentally induced health problems and related costs** (e.g. years of healthy life lost from degraded environmental conditions) • Population exposure to air pollution
	17. Exposure to natural or industrial risks and related economic losses
Environmental services and amenities	**18. Access to sewage treatment and drinking water** 18.1 Population connected to sewage treatment (at least secondary, in relation to optimal connection rate) 18.2 Population with sustainable access to safe drinking water
Economic opportunities and policy responses	
Environmental goods and services	**19. Production of environmental goods and services (EGS)** 19.1 Gross value added in the EGS sector (in % of GDP) 19.2 Employment in the EGS sector (in % of total employment)
International financial flows	**20. International financial flows of importance to GG** (in % of total flows; in % of GNI) 20.1 Official development assistance 20.2 Carbon market financing 20.3 Foreign direct investment
Prices and transfers	**21. Environment-related taxation** Level of environment-related tax revenues (in % of total tax revenues) Structure of environment-related taxes (by type of tax base)
	22. Energy pricing (share of taxes in end-use prices)
	23. Water pricing and cost recovery *To be complemented with indicators on:* • *Environment-related subsidies* • *Environmental expenditure: level and structure* *(pollution abatement and control, biodiversity, natural resource use and management)*
Regulations and management approaches	*24. Indicators to be developed*
Training and skill development	*25. Indicators to be developed*

Table A.2: UNEP indicators for green economy policy making

Dimension	Theme	Indicator
Environmental	Climate change	• Carbon emissions (ton/year) • Renewable energy (share of power supply) (%) • Energy consumption per capita (Btu/person)
	Ecosystem management	• Forestland (ha) • Water stress (%) • Land and marine conservation area (ha)
	Resource efficiency	• Energy productivity (Btu/$) • Material productivity (ton/$) • Water productivity ($m^3$/$) • CO_2 productivity (ton/$)
	Chemicals and waste management	• Waste collection (%) • Waste recycling and reuse (%) • Waste generation (ton/year) or landfill area (ha)
Policy	Green investment	• R&D investment (% of GDP) • EGSS investment ($/year)
	Green fiscal reform	• Fossil fuel, water and fishery subsidies ($ or %) • Fossil fuel taxation ($ or %) • Renewable energy incentive ($ or %)
	Pricing externalities and valuing ecosystem service	• Carbon price ($/ton) • Value of ecosystem services (e.g. water provision)
	Green procurement	• Expenditure in sustainable procurement ($/year and %) CO_2 and material productivity of government operations (ton/$)
	Green job skill training	• Training expenditure ($/year and % of GDP) • Number of people trained (person/year)
Well-being and equity	Employment	• Construction (person, %) • Operation and management (person, %) • Income generated ($/year) • Gini coefficient
	EGSS performance12	• Value added ($/year) • Employment (jobs)
	Natural and human capital	• Value of natural resource stocks ($) • Net annual value addition/removal ($/year) • Literacy rate (%)
	Access to resources	• Access to modern energy (%) • Access to water (%) • Access to sanitation (%) • Access to health care (%)
	Health	• Level of harmful chemicals in drinking water (g/litre) • Number of people hospitalised due to air pollution (person) • Road traffic fatalities per 100,000 inhabitants (transport related)

Table A.3: World Bank framework for measuring potential benefits from green growth policies

Type of benefit	Channels	Examples of indicators
Environmental	Improved environment	Indicators specifically developed for the domain in question (for example, reduction in greenhouse gas emissions, natural area protected from development, air or water quality).
Economic	Increase in factors of production (physical capital, human capital, and natural capital)	Measured by the additional production from increased capital (potentially measured by the value of ecosystems or renewable resources), or by the value of additional capital.
	Accelerated innovation, through correction of market failures in knowledge	Measured by productivity indicators (for example, efficiency of photovoltaic panels used to produce electricity) or dissemination indicators (for example, the fraction of the population with access to photovoltaic electricity).
	Enhanced efficiency, through correction of non-environmental market failures	Measured by indicators for resource efficiency (for example, the material or energy intensity of production, reduction in the time of in the value of time lost from congestion), or by additional production.
Social	Increased resilience to natural disasters, commodity price volatility, and economic crises	Measured by metrics related to the project, from avoided disaster losses (in monetary terms) or number of people at risk from floods to a measure of the vulnerability to oil price volatility.
	Job creation and poverty reduction	Measured by the number of jobs created or an indicator of the impact on the poor (for example, reduction in the number of people without access to drinking water and sanitation).

Annex III

On the relationship between social and environmental indicators — an analysis based on the EU SDI set

This section shows some main findings of an analysis carried out in the run-up to the preparation of the 2013 Monitoring Report. The full report including details on the statistical analysis is available for download on the Eurostat website. ([4])

Introduction

Since our societies and human activities are embedded within the natural environment, environmental and social issues tend to be closely interrelated. Social factors affect environmental quality in different ways, through patterns of consumption and production and rising levels of population growth, for example. The effects of human activity on the natural environment have been increasingly pronounced in recent years by climate change, ecological degradation and overexploitation of resources. Environmental issues, on the other hand, have direct consequences on human well-being such as, for instance, the impact of pollution and natural disasters on health, future life chances for individuals and equality of wealth and opportunity. It has been argued that achieving sustainable development and resolving important ecological problems requires not only rethinking our economic growth model but also attaining social cohesion by addressing important social issues such as poverty, inequality and institutional and governance weaknesses ([5]). Poverty and inequality are found to hamper the ability to effectively cooperate in preserving natural assets as these social problems affect how individual relate to their environment and in particular their willingness to protect and invest in the environment. Joseph E. Stiglitz argues that positive synergies between environmental and social issues can reinforce each other 'With a low level of inequality, you have high demand for good environmental policies, and those good environmental policies then lead to less inequality in our society' ([6]).

Methodology

To analyse the interlinkages between environmental and social trends at the European level correlation tests (mainly based on Pearson's correlation coefficient; in some cases also Spearman's rank order correlation coefficient was calculated) between selected social and environmental indicators within the EU SDI set were carried out. The tests were carried out as country-wise correlations based on the most recent data for all countries (in some cases the year before the most recent year (T-1) has been used to maximise the number of countries for which data are available); to see if occurrence of high/low figures for environmental indicators go hand-in-hand with high/low figures for social indicators across countries. Due to the rather low number of observations (limited by the number of countries for which data are available from Eurostat) a significance level of 0.1 has been used to identify significant correlations between environmental and social indicators.

Pollution and health outcomes

Outdoor air pollution is an important environmental problem, which has a direct impact on the quality of people's lives. A large number of studies in recent years have reported an association between increase in daily levels of ozone and particulate matter and increase in mortality and incidence of respiratory and cardiovascular diseases in the short term ([7]). The association between chronic exposure to fine particles nd the

([4]) http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/files/Analysis%20of%20the%20relationship%20between%20social%20and%20environm.pdf
([5]) For more information see: Boyce,K. (2007). 'Is inequality Bad for the Environment?'; Boyce, J.(2003). 'Inequality and environmental protection'.; Baland, J., Bardhan, P. and Bowels, S. (2006). 'Inequality, Cooperation and Environmental Sustainability', Princeton University Press'
([6]) Joseph E. Stiglitz, October 5 2012 'Resources 2020' speech.
([7]) Anderson HR, Atkinson R, Peacock JL, Marston L, Konstantinou K. Meta-analysis of time series studies of particulate matter (PM) and ozone (O_3). EUR/04/5042688; Atkinson R, Anderson HR, Medina S, Iniguez C, Forsberg B, Segerstedt B, et al. Analysis of all-age respiratory hospital admissions and particulate air pollution within the APHEIS programme. APHEIS health impact assessment of air pollution and communication strategy. Third year report; 2005; Ballester F, Rodriguez P, Iniguez C, Saez M, Daponte A, Galan I, et al. Air pollution and cardiovascular admissions association in Spain: results within the EMECAS project; Faustini A, Stafoggia M, Berti G, Bisanti L, Chiusolo M, Cernigliaro A, et al. The relationship between ambient particulate matter and respiratory mortality: a multi-city study in Italy. Eur Respir J 2011; Garrett P, Casimiro E. Short-term effect of fine particulate matter ($PM_{2.5}$) and ozone on daily mortality in Lisbon, Portugal. Environ Sci Pollut Res Int 2011; Gryparis A, Forsberg B, Katsouyanni K, Analitis A, Touloumi G, Schwartz J, et al. Acute effects of ozone on mortality from the 'air pollution and health: a European approach' project. Am J Respir Crit Care Med 2004; 170:1080–7; Ito K, De Leon SF, Lippmann M. Associations between ozone and daily mortality: analysis and meta-analysis. Epidemiology 2005;16:446–57. J Epidemiol Community Health 2006; 60:328–36.

incidence and risk of long-term mortality and chronic diseases such as lung cancer, cardiovascular diseases, and respiratory infections has also been extensively documented ([8]).

Based on the analysis, the number of years men and women in the EU can expect to live in good health does not show a strong correlation with the urban population exposure to air pollution by ozone across countries.

Similarly, we do not find any strong relationship between male and female life expectancy and urban population exposure to pollution by ozone. This rather unexpected finding (both for healthy life years (HLY) and life expectancy (LE)) may be partly caused by the fact that figures for HLY and LE are projections based on previous trends (HLY and LE show how long a child born today is expected to live (healthy)) that are not (yet) influenced by rising pollution levels, and partly because the exposure to air pollution indicator mainly covers the urban population, whereas HLY and LE refer to the total (including rural) population of a country.

However, analysis of the relationship between urban exposure to air pollution by particulate matter and deaths due to chronic diseases shows a moderate correlation between urban population exposure to pollution by particulate matter and the death rate due to chronic diseases across countries.

The correlation between these two indicators does not seem to be driven by GDP, although urban exposure to air pollution by particulate matter shows a relatively strong correlation with GDP per capita, no relationship was identified between death rates due to chronic diseases and GDP per capita. This observation allows one to infer a causal relationship between the two indicators, which is also supported by the numerous academic studies referred to above.

Unemployment, social exclusion, energy consumption and emissions

In a number of cases existing correlations between social and environmental indicators were found to be driven by GDP, in particular with regard to (i) CO_2 emissions and unemployment, (ii) people at risk of poverty and energy consumption and (iii) inequality and primary energy consumption. Results show that countries faring well with regard to the main social indicators also tend to exert higher environmental pressures and vice versa. This observation seems to contradict the above discussed theoretical arguments and points to a trade-off rather than a win-win situation in terms of socioeconomic development and environmental sustainability: a better social situation (employment, unemployment, poverty, inequality) seems to go hand-in-hand with higher environmental pressures (energy consumption, emissions). This is consistent with the trends already analysed in this monitoring report during the crisis: while social indicators show deterioration, environmental indicators have improved during the contraction of the economy.

Unemployment

A moderate negative correlation can be observed between unemployment rate and CO_2 emissions per inhabitant across countries. Part of this relationship may be explained by a strong driving force exerted by GDP per capita on unemployment rate. Although a strong relationship between CO_2 emissions per inhabitant and per capita GDP was not identified, an indirect link between the two indicators can be traced. A country's CO_2 emissions per inhabitant depend on its energy mix, namely the share of renewables and nuclear energy relative to the share of fossil energy used in the energy production. Energy production and consumption, on the other hand, are closely related to GDP per capita. The relationship between energy consumption and per capita income is a well-researched issue in energy economics ([9]) and it also emerges for our sample of countries. Therefore, considering the above mentioned indirect relationship between per capita GDP and energy consumption and the strong correlation between per capita GDP and unemployment rate, it is reasonable to assume that the moderately strong correlation between CO_2 emissions and unemployment is driven by GDP.

([8]) Brook, R. et al (2010). Particulate Matter Air Pollution and Cardiovascular diseases; Hassing, C. (2009). Particulate Air Pollution, Coronary heart Disease and Individual Risk assessment: a General Overview.; Chen, H. and Goldberg, M. (2009), The Effects of Outdoor Air Pollution on Chronic Illness. 'Associations between Daily Mortalities from Respiratory and cardiovascular Diseases and Air Pollution in Hong Kong, China'; Jerrett M, Burnett RT, Ma R, Pope III CA, Krewski D, Newbold KB, et al. (2005) 'Spatial analysis of air pollution and mortality in Los Angeles. Epidemiology'; 16:727–36; Krewski D, Jerrett M, Burnett RT, Ma R, Hughes E, Shi Y, et al. (2009) 'Extended follow-up and spatial analysis of the American Cancer Society study linking particulate air pollution and mortality'. Res Rep Health Eff Inst:5-114; Pope III CA, Burnett RT, Thun MJ, Calle EE, Krewski D, Ito K, et al. (2002) 'Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution'. JAMA.287:1132–41; Pope III CA, et al. (2013). 'Cardiovascular mortality and long-term exposure to particulate air pollution: epidemiological evidence of general pathophysiological pathways of disease'. Circulation 2004; 109:71–7; Pascal, et. al (2013) 'Assessing the public health impacts of urban air pollution in 25 European cities: Results of the Aphekom project'. Science of the Total Environment 449 390–400.

([9]) Chontanawat, J. and Hunt, L. (2006). *Causality between Energy Consumption and GDP: Evidence from 30 OECD and 78 Non-OECD Countries;* Soytas. U and Sari, R.(2003). Energy Consumption and GDP: Causality Relationship in G-7 Countries and Emerging Markets.

Poverty

The strong negative relationship between a country's per capita energy consumption and its poverty levels (as measured by 'People at risk of poverty or social exclusion' and 'At-risk-of-poverty rate after social transfers') is consistent with the correlations between energy consumption and employment/unemployment discussed above. As a strong correlation exists between per capita GDP and energy consumption per capita as well as between per capita GDP and people at risk of poverty or social exclusion and people at risk of poverty after social exclusion, it is most likely that the observed relationship between energy consumption and people at risk of poverty is mediated by this variable. Consequently, also here GDP per capita has to be partly considered as driving force behind this relationship.

Inequality

There exist a strong negative relationship between primary energy consumption per capita and the three measures of inequality (income quintile share ratio, Gini coefficient and income decile share ratio). Energy consumption per capita tends to be higher in countries with a lower rate of inequality. The relationship is statistically significant for all the three inequality measures, but more strongly pronounced for the income quintile share ratio and the GINI coefficient. Similarly to the observations above, the association between the two indicators seems to occur through GDP since GDP is strongly linked both to primary energy consumption and inequality.

The analysis also reveals a moderate negative relationship between CO_2 emissions per capita ([10]) and the income quintile ratio — countries with higher CO_2 emissions per inhabitant tend to have lower inequality level as measured in terms of income quintile share ratio. Again, this relationship seems to be mediated through GDP — more developed countries (with a higher GDP per capita) exert stronger environmental pressures but have fewer inequalities. The analysis does not show correlation between inequality and other environmental indicators such as resource productivity, share of renewable energy in gross final energy consumption, energy consumption of transport relative to GDP and the common bird index.

Renewable energy and education

Public expenditure on education shows a relatively low positive correlation (Pearson ρ=0.35) with the share of renewable energy in gross final energy consumption. In this case GDP does not seem to be a mediator variable underlying the relationship as it does not show any strong correlation neither with the share of renewable energy in gross final energy consumption, nor with public expenditure on education. However, the link between share of renewable energy and expenditure on education is likely to be related to other socioeconomic and geographical factors. Scandinavian countries are leading the way in terms of share of renewable energy sources (Norway: 61.1 %, Sweden: 47.9 %, Denmark: 22.2 %, Finland: 32.2 %). At the same time, Nordic countries share another common trait: they are known for prioritising education in relation to their overall allocation of resources. Scandinavian countries have some of the highest share of public expenditure on education as percentage of GDP. Based on these observations it seems likely that the relationship between share of renewable energy and public expenditure on education is not a causal one, but it rather reflects the socioeconomic characteristics of the countries in our sample and their welfare state models.

([10]) Used a proxy for the headline indicator 'GHG emissions', which only shows change in time and not absolute (per capita) emissions at a certain point in time.

European Commission

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