

EU sustainable development indicators: An overview

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Abstract

The European Union's commitment to sustainable development at the 1992 Earth Summit resulted in an EU-wide sustainable development strategy, adopted in Gothenburg in 2001. This article presents an overview of the set of sustainable development indicators (SDIs) recently adopted by the European Commission to monitor, assess and revise the strategy. It provides a critical assessment of the current status of the indicator set, and reviews the main policy trends in the areas of the strategy through a brief analysis of headline indicators, placing energy and climate change issues in a broader perspective. Finally, the article compares the energy SDIs to the recent inter-agency energy indicators for sustainable development (EISD), underlining their similarities as well as their different priorities and objectives. The article concludes that further research is needed to improve the SDI set and further explore the linkages between themes.

Keywords: Sustainable Development; Indicators; European Union; Policy; Energy; Interlinkages.

1. Introduction

Sustainable development (SD) is an overarching goal, which affects not only energy, but all sectors of activity. The European Union's commitment to sustainable development at the first Earth Summit in Rio de Janeiro ultimately led to an EU-wide sustainable development strategy (SDS), adopted at the European Council of Gothenburg in 2001. The European Commission has since adopted a set of sustainable development indicators (SDIs) to help monitor the strategy and support its ongoing revision (EC, 2005a, b). The indicators were developed with the help of a group of national experts, known as the Sustainable Development Indicators Task Force. The set of indicators is organized within ten themes, reflecting the political priorities of the strategy, and related subsequent political commitments.

This article first focuses, in Section 2, on the issues underlying the development of the framework of SDIs: the structure of the indicator set; selection criteria; integration; and data availability. In Section 3, the actual trends for the 12 headline indicators are briefly explored, underlining linkages with energy issues. Finally, a comparison between the SDI energy indicators, and the parallel initiative on energy indicators for sustainable development (EISD), developed at a global level, is undertaken.

2. The framework

2.1. Themes and subthemes

A hierarchical theme framework has been developed on the basis of the policy priorities of the sustainable development strategy. The ten themes, which may be further developed in the future, are: economic development; poverty and social exclusion; ageing society; public health; climate change and energy; production and consumption patterns; management of natural resources; transport; good governance; and global partnership.

The themes correspond to the six priority areas of the 2001 Commission Communication (EC, 2001), with the addition of global partnership which addresses issues raised in the 2002 Communication on the external dimension of sustainable development (EC, 2002), while production and consumption patterns and good governance arise from the Plan of Implementation of the World Summit on Sustainable Development (WSSD, 2002). The theme of economic development highlights the economic dimension of sustainable development and bridges it to the Lisbon process.

The themes are further divided into subthemes (Level 2 indicators) and areas to be addressed (Level 3 indicators).¹ The subthemes usually monitor progress towards the headline objectives while the 'areas to be addressed' facilitate a

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¹ The detailed framework and the full list of indicators are available on the Eurostat SDI website: <http://europa.eu.int/comm/eurostat/sustainabledevelopment>.

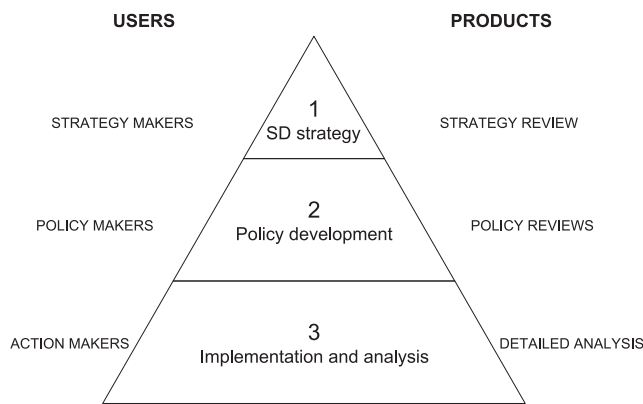


Figure 1. Indicator pyramid.

more detailed and diversified analysis of background factors in each theme.

2.2. A pyramid structure

The hierarchical framework lends itself readily to an indicator pyramid, especially as the three levels of the framework also correspond to the objectives and measures to be monitored by SDIs. Figure 1 illustrates the approach to different levels of policy-making and the respective core products using the SDIs.

Level 1 (L1) consists of a set of 12 high level indicators that provide an initial analysis of the theme. These indicators are aimed at policy-making and the general public, and can therefore be seen as headline indicators.

Level 2 (L2) corresponds to the subthemes of the framework and, together with Level 1, monitors progress in achieving policy objectives under the headline. These 45 indicators are aimed at evaluating core policy areas and communicating with the general public.

Level 3 corresponds to the specific areas to be addressed, i.e., various measures implementing the headline objectives and facilitates a deeper insight into detailed issues in the theme. These 98 indicators are aimed at further policy analysis and better understanding of the trends and complexity of issues associated with the theme or inter-linkages with other themes in the framework. They are intended for a more specialized audience.

In order to avoid duplication, indicators are allocated to only one theme. However some indicators may contribute to the assessment of more than one theme.

2.3. The selection of indicators

The selection of SDIs applies the same principles as the Laeken² indicators:

- An indicator should capture the essence of the problem and have a clear and accepted normative interpretation.
- An indicator should be robust and statistically validated.
- An indicator should be responsive to policy interventions but not subject to manipulation.
- An indicator should be measurable in a sufficiently comparable way across Member States, and comparable as far as practicable with international standards.
- An indicator should be timely and susceptible to revision.
- The measurement of an indicator should not impose a burden disproportionate to its benefits on Member States, on enterprises, nor on the Union's citizens.

And the portfolio of indicators should adhere to the following principles:

- The portfolio of indicators should, as far as possible, be balanced across different dimensions.
- The indicators should be mutually consistent within a theme.
- The portfolio of indicators should be as transparent and accessible as possible to EU citizens.

However, due to the policy needs and the lack of data in some fields, a pragmatic approach has been adopted and the criteria have been applied with some flexibility in order not to exclude too many new key areas for sustainable development. Therefore some of the indicators proposed do not fulfil all of the criteria, but have been included because they are important contextual indicators for the strategy.

An iterative selection process was applied, with the goal of selecting a set of indicators responding to the following priority concerns:

- Indicator responsiveness and relevance to the headline objectives of the SDS and other EU policies;
- Adequate coverage of the SD dimensions (economic, social and environmental) in each theme;
- Adequate coverage of the SD perspectives (welfare, equity, efficiency, adaptability to changing conditions and transfers to future generations) in each theme;
- Limited number of L1 indicators (1–2) and L2 indicators (1–2 per subtheme);
- Complementarity of indicators between themes; and
- Use of most relevant breakdowns only (e.g., gender, age, income group, sector).

2.4. 'Best-needed' and 'best-available' indicators

The SDS and the relevant EU policy documents encompass several priority areas on which no information or only partial information is available. To improve the availability

² The list of Laeken indicators is an answer to the request by the Nice European Council for a set of indicators to monitor progress towards the

fight against social exclusion and poverty in the European Union (Eurostat, 2004a).

Table 1. ‘Best-available’ and ‘best-needed’ indicators (number of indicators)

Theme	Level 1			Level 2			Level 3			TOTAL
	BA ^a	BN ^a	Total	BA ^a	BN ^a	Total	BA ^a	BN ^a	Total	
Economic development	1	–	1	4	–	4	16	–	16	21
Poverty and social exclusion	1	–	1	3	–	3	8	2	10	14
Ageing society	1	–	1	2	1	3	5	2	7	11
Public health	1	–	1	2	3	5	7	6	13	19
Climate change and energy	2	–	2	4	–	4	7	2	9	15
Production and consumption patterns	–	1	1	4	3	7	8	4	12	20
Management of natural resources	1	1	2	1	4	5	2	8	10	17
Transport	–	1	1	4	1	5	6	3	9	15
Good governance	1	–	1	2	3	5	3	2	5	11
Global partnership	1	–	1	4	–	4	6	1	7	12
TOTAL	9	3	12	30	15	45	68	30	98	155

Notes: ^a BA: ‘best-available’; BN: ‘best-needed’.

of data for policy-making and to describe the longer-term priority needs, the indicators were split into two categories: ‘best-available’ and ‘best-needed’.

The ‘best-available’ indicators are those that can be compiled on the basis of existing data. The ‘best-needed’ indicators refer to indicators on which:

- Concepts, definitions or data do not yet exist;
- Data exist, but of a quality that is not sufficient to allow publication, or the breakdowns needed are not available, or;
- Data exist, but quality is unknown.

Some of the ‘best available’ indicators may not be the ideal indicators for SD policy issues, but serve as proxies for the ‘best-needed’ indicators.

Table 1 illustrates the present situation concerning ‘best-available’ and ‘best-needed’ indicators. Most satisfactory are the themes on: economic development; poverty and social exclusion; ageing society; climate change and energy; as well as global partnership, for which the data quality of ‘best-available’ indicators is satisfactory and only one indicator at Levels 1 and 2 is a proxy for a ‘best-needed’ one. The most problematic situation appears in the themes: public health; production and consumption patterns; management of natural resources; and transport, in which a large number of indicators are ‘best-needed’.

Proxies can be considered as an intermediate answer to the policy issues defined by ‘best-needed’ indicators. In the SDI set, three headline indicators and six Level 2 indicators are proxies that will be replaced with ‘best-needed’ indicators at a later stage. Due to the limited coverage, proxies provide only preliminary, and very often only marginally satisfactory information on progress towards policy objectives. Nevertheless, due to the very slow process of producing new data, the contribution of proxies is indispensable in the short-term for the monitoring of

some priority areas in order not to leave key problems without answer.

For almost all the 107 ‘best-available’ indicators (which represent 69% of the 155 SDIs), data are available and published on the Eurostat website.³ Most of these indicators come from Eurostat’s regular data collection, but data are often not available for all EU Member States and candidate countries.

Depending on the policy area, the development of new methods of data production may take a minimum of two years. Consequently, it would be necessary to prioritise data development efforts and focus on the collection of data needed for the compilation of ‘best-needed’ indicators.

Another concern is the relatively small number of proxies available for the ‘best-needed’ indicators (6 out of 15 for Level 2 indicators, 2 out of 30 for Level 3 indicators). However, this has the positive effect of identifying information needs in new important areas and aspects that will contribute to better knowledge and monitoring of sustainable development. The negative aspect is that these areas will suffer from the lack of any data for several years. Consequently, there is an urgent need for further research in order to facilitate an accelerated statistical and/or administrative data production related to areas where mostly ‘best needed’ indicators are available.




2.5. Integration

The integration of economic, social and environmental dimensions for the monitoring of sustainable development strives for a balanced view on achievements of the priority objectives and targets. In the current SDI set, the dimensional integration takes place within individual indicators or as a theme-wise combination of indicators. An indicator

³ <http://europa.eu.int/comm/eurostat/sustainabledevelopment>.

Table 2. Quality of data in the preliminary set of SDIs at Levels 1 and 2

Economic Development	Poverty and social exclusion	Ageing society	Public health	Climate change & energy	Production & consumpt. patterns	Management of natural resources	Transport	Good governance	Global Partnership
Investment	Monetary poverty	Pension adequacy	Health protection and lifestyles	Climate change	Eco-efficiency	Biodiversity	Transport growth	Policy coherence	Globalizat. of trade
Competitiveness	Access to labour market	Demographic changes	Food safety and quality	Energy	Consumpt. patterns	Marine ecosystems	Transport prices	Public participation	Financing for develop.
Employment	Other asp. of social exclusion	Public finance sustainabil.	Chemicals management		Agriculture	Freshwater resources	Social and env. impact of transport		Resource management
			Health risks due to env. conditions		Corporate responsibil.	Land use			

	Data available of good quality.
	Lack of data in some areas, problems of quality.
	Severe lack of data or methodological problem.

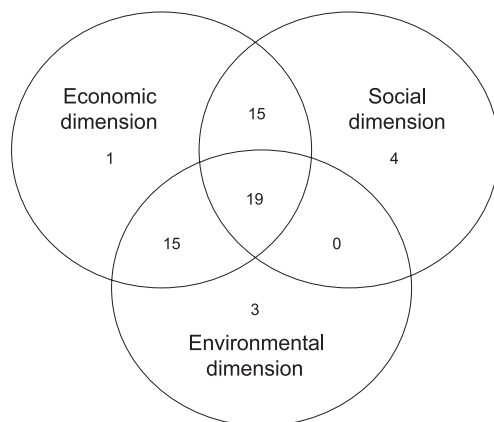


Figure 2. Dimensional integration of SDIs at Levels 1 and 2 (number of indicators).^a

Note: ^a The allocation of indicators across dimensions involves some degree of subjectivity, and could be interpreted in a number of ways. The classification given here is for illustration purposes.

may represent developments in all three dimensions or may also consist of several variables representing different dimensions and providing an integrated message in a graphical presentation.

The SDI set (at Levels 1 and 2) assesses the progress in sustainable development from the perspectives of all three dimensions in a rather balanced way. Of the indicators designed for communication with the general public, 34% integrate three dimensions, and 86% address at least two dimensions (see Figure 2).⁴ The main weakness concerns

the lack of indicators measuring both the social and environmental dimensions.

The theme-wise situation gives a more diversified picture and the coverage of the various dimensions varies considerably between themes. Integration could be the subject of some improvement in the future. For instance, socio-economic factors, individual preferences, choices or behaviour tend to be 'invisible' driving forces for both economic and environmental development, but are not fully surveyed from a SD perspective. Furthermore, the economic value or the social importance of the diversity and quality of the natural environment are seldom distinguished as contributors to welfare. Such areas would require further conceptual research before the best indicators can be assigned.

The current and forthcoming welfare issues are fairly well addressed, but indicators for efficiency and capacity of adaptation to changing conditions could be improved.

2.6. Overview of data situation

Problems such as data availability, lack of international definitions or methodologies, poor coverage or limited access to data may severely hinder the compilation of SDIs.

Table 2 presents an overview of data quality in the set of SDIs. It indicates that none of the themes have excellent data quality, but around 69% of the indicators have publishable data quality. The best situation concerning data can be found in the themes: economic development; poverty and social exclusion; ageing society; climate change and energy; and in global partnership. Merely satisfactory or poor data are available for all the other themes, and 12 subthemes out of 31 cannot be monitored at all due to shortcomings in data, concepts, definitions and/or

⁴ The allocation of indicators across dimensions involves some degree of subjectivity, and could be interpreted in a number of different ways. The classification given here is for illustration purposes.

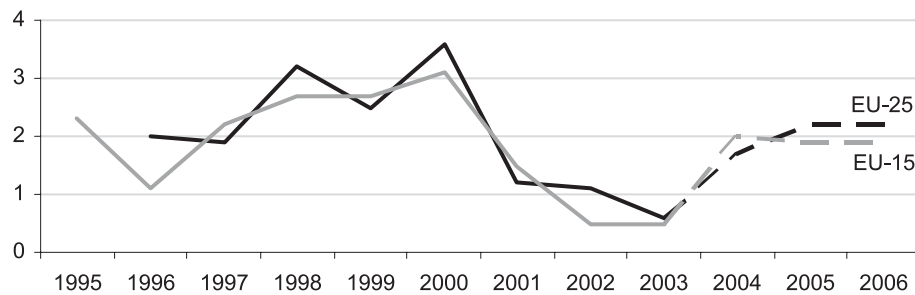


Figure 3. Growth rate of real GDP per capita. Percentage change over previous year at constant prices (1995).
Source: Eurostat.

methodologies. Data availability is mainly based on statistical sources, but in some areas, such as ageing or climate change, modelling contributes considerably to data production.

2.7. Link with other indicator initiatives

The development of the EU SDIs included an initial phase of reviewing and adapting other major initiatives in SD indicators, such as those of the UN (UN, 1996; Eurostat, 2001) and the OECD (OECD, 2000). Close links are also maintained with other related initiatives, such as the indicators for the Millennium Development Goals.

SDIs are also related to other relevant indicators at EU level. The set of SDIs is closely connected to the set of structural indicators used to monitor the Lisbon Strategy: 33 of the SDIs (out of 155) are also structural indicators. There is also a high degree of similarity between the SDIs relating to poverty and social exclusion and the Laeken indicators. Additionally, relevant indicators were retained from other EU initiatives, such as the EEA core set of indicators.

3. Reviewing the trends in the main priority areas

Each SDI theme is composed of a number of indicators looking at major policy trends at different levels of detail. To give an overview of the main policy issues, we briefly present here the trends in the headline indicators. Further details and analysis can be found in Eurostat (2004b) and Eurostat (2005, forthcoming).

3.1. Economic development. Striving for structural reforms and new dynamism

The Lisbon process lays down the ambition that the EU should have the world's most competitive and knowledge-based economy by 2010. The agenda underlines the need for economic growth, innovation and the pursuit of structural reforms to raise Europe's growth potential. At the same time, it recognises the need for social cohesion and environmental protection.

The headline indicator, GDP per capita growth,⁵ measures the dynamism of the economy and its ability to deliver general welfare to its population (see Figure 3). In the EU-15, GDP per capita increased steadily from 1996 to 2000, but economic growth was rather sluggish in the following three years, with average annual GDP per capita growth remaining below 1.5% in both the EU-15 and EU-25.

Indicators in subthemes of economic development look at investment, competitiveness, and employment to further assess the sustainability of macroeconomic developments. These topics also influence long-term developments in socio-economic conditions, technological development and a shift to more sustainable production and consumption. An increase in GDP per capita itself influences most other themes of sustainable development. There is in particular a strong link with energy issues: a growth in the economy often implies a growth in energy consumption. Given the consequences of climate change, sustainable development policy should focus on developing renewable energy, and on reducing the energy intensity of the economy.

3.2. Poverty and social exclusion. Towards stronger cohesion

Poverty and social exclusion have high social costs and lead to a waste of human capacity. Tackling these problems is central to the sustainable development of present and future generations. Therefore, one of the objectives of the SD strategy is to make a decisive impact on the eradication of poverty.

The headline indicator, population at risk of poverty,⁶ monitors this target (see Figure 4). The percentage of the population at risk of poverty in the EU-15 fell slightly during the 1990s, and remained stable from 1998 to 2000, but increased again in 2001, which is a worrying trend.

Subthemes in poverty and social exclusion look at monetary poverty, access to the labour market, and other

⁵ Gross domestic product (GDP) is defined as the value of all goods and services produced less the value of any goods or services used in their creation. The indicator refers to the growth rate of GDP per inhabitant at constant (market) prices.

⁶ The indicator is defined as the share of persons with an equivalized total net income (after social transfers) below 60% of the national median income.

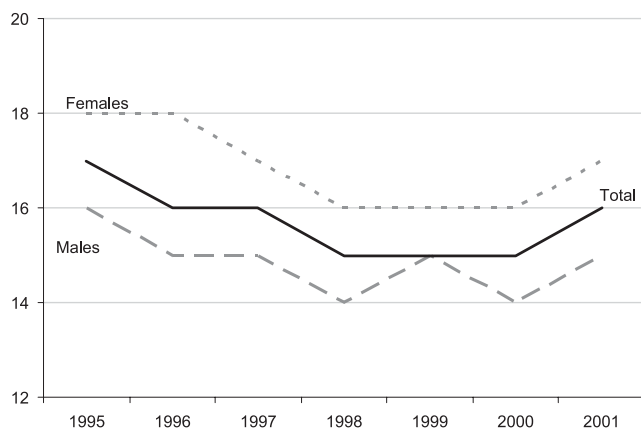


Figure 4. At-risk-of-poverty rate after social transfers in the EU-15 (in percent).
Source: Eurostat.

aspects of social exclusion. These also affect the overall state of health, the income of persons aged over 65, and levels of consumption, and may affect in particular energy consumption. Energy consumption usually represents a higher proportion of revenue spending in low income households, and controlling energy consumption through prices or taxes may therefore have regressive effects.

3.3. Ageing society. Highlighting needs for renewal of the economy

The ageing of society is a complex socio-economic issue that affects not only retired persons, but also the whole workforce and economy. The objective of the SD strategy is to address the demographic challenge and to ensure the adequacy of pension systems as well as health care and childcare systems while maintaining the sustainability of public finances and intergenerational solidarity.

The headline indicator, current and projected old-age dependency ratio (see Figure 5),⁷ indicates the potential

increasing financial burden in terms of pensions and costs of care systems for the elderly, unless measures are taken. According to current trends, the old-age dependency ratio in the EU will almost double over the next 50 years, from 24.1% to 47.2%. In the next decades, an ever-smaller working age population will have to support an ever-greater number of pensioners.

Subthemes in ageing society look at pension adequacy, demographic changes, and financial stability that describe welfare conditions, but also influence the production and consumption of goods and services, including energy consumption.

3.4. Public health. Poorly known welfare factor

A healthy population is traditionally considered crucial for the well-being of society, and also as an important driver of economic prosperity. The main concerns of the EU strategies for sustainable development and for health relate to the overall health of citizens; outbreaks of infectious diseases and resistance to antibiotics; maintenance of food safety and quality; management of chemicals; as well as for health and the environment (with particular reference to children); addressing inequalities and improving the effectiveness of health systems; mental health; and communicable diseases.

The headline indicator, healthy life years at birth (see Figure 6), measures the number of years that a male or female child at birth is expected to live in good health. This is a health expectancy indicator, which combines information on mortality and morbidity. Disability-free life expectancy at birth has continuously risen since 1999, and is on average higher at birth for females than males by 1.5 points.

Further assessments focus on human health protection and lifestyles, food safety and quality, management of chemicals, and health risks due to environmental conditions. The headline indicator reflects long-term socio-economic

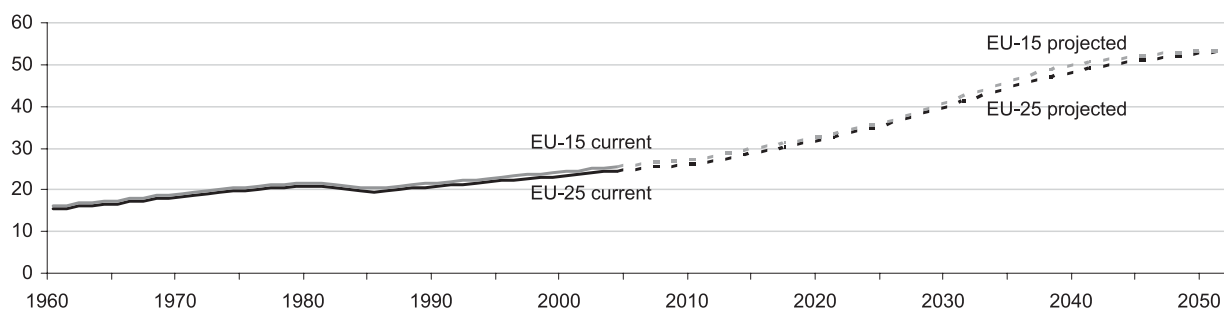


Figure 5. Current and projected old-age dependency ratio (in percent).
Source: Eurostat.

⁷ The old-age dependency ratio is the ratio of the number of elderly persons of an age when they are generally economically inactive (aged 65 and over

or aged 60 and over depending on the context) to the number of persons of working age (from 15 to 64 or from 20 to 59 depending on the context).

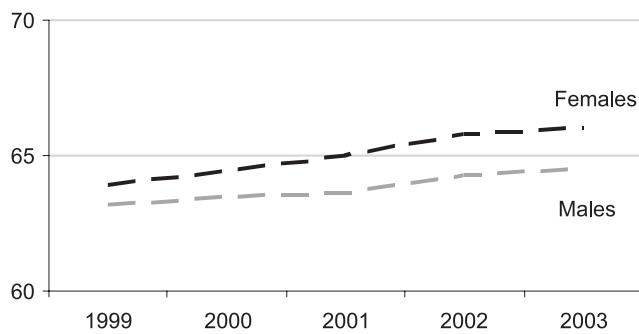


Figure 6. Expectancy of healthy life years at birth in the EU-15 (number of years).
Source: Eurostat.

and environmental conditions which are described first of all under the themes: economic development; poverty and social exclusion; ageing society; and management of natural resources.

3.5. Climate change and energy. Limiting global warming

Man-made impact on the climate is primarily due to emissions of the six main greenhouse gases (GHGs), largely arising from industry and production/consumption of energy, but also from transport, agriculture, and waste management. The objectives of the SD strategy are to meet the Kyoto commitment⁸ and to increase the use of clean energy.

The indicator measuring GHG emissions versus the Kyoto target⁹ shows that (see Figure 7) significant reductions in GHG emissions were achieved from 1990 to 2000, in particular due to the replacement of coal-fired power stations with more efficient and less carbon-intensive gas-fired plants. In contrast, between 2000 and 2003, GHG emissions from the EU-15 have increased, mainly as a result of a marked increase in energy use, particularly for electricity and transport, combined with a slow-down in fuel switching to lower carbon sources in power stations. The current upward emission trend threatens the fulfilment of the Kyoto target, although some countries have recently implemented Kyoto flexible mechanisms which may curb future emissions. The targets and reference years for the new Member States largely differ from one another and do not facilitate similar distance-to-target assessment for the EU-25.

The second headline indicator, gross inland energy consumption,¹⁰ demonstrates that energy consumption increased more rapidly between 2000 and 2003 than in the previous decade. The use of fossil fuel continued to increase, with in particular a marked increase in natural gas (see Figure 8). The uptake of renewable energy has been significant, but it still only accounted for 6% of primary energy in 2003, while the target set for 2010 is 12%.

Interlinkages both in terms of causes and consequences of climate change are wide ranging. Emissions are closely related to the level of economic activity, energy mixes — approximately 80% of greenhouse gas emissions are attributable to energy consumption — and transport patterns. The consequences of climate change affect global

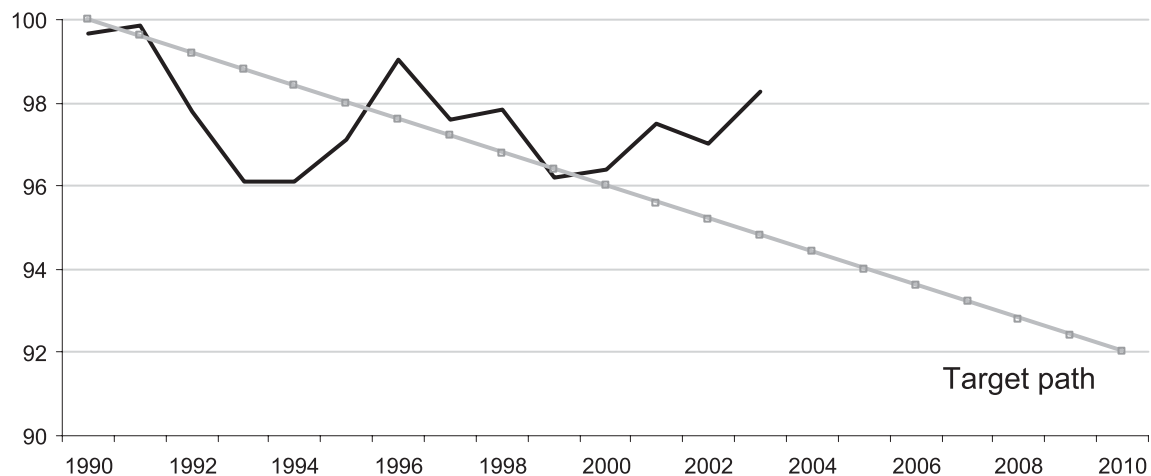


Figure 7. Total GHG emissions in the EU-15 and target according to Kyoto Protocol for 2008–2012 (as percentage of base year emissions).
Source: European Environment Agency, Eurostat.

⁸ The EU ratified the Kyoto Protocol in 2002. The EU target of a reduction in GHG emissions of 8% compared with 1990 levels should be achieved by 2008–12. The EU SD strategy has set a further objective of an average 1% per year reduction over 1990 levels up to 2020.

⁹ Emissions of the six greenhouse gases covered by the Protocol are weighted by their global warming potentials and aggregated to give total emissions in CO₂ equivalents. The total emissions are presented as indices, with 1990 = 100.

¹⁰ Gross inland energy consumption is the quantity of energy consumed within the borders of a country/zone.

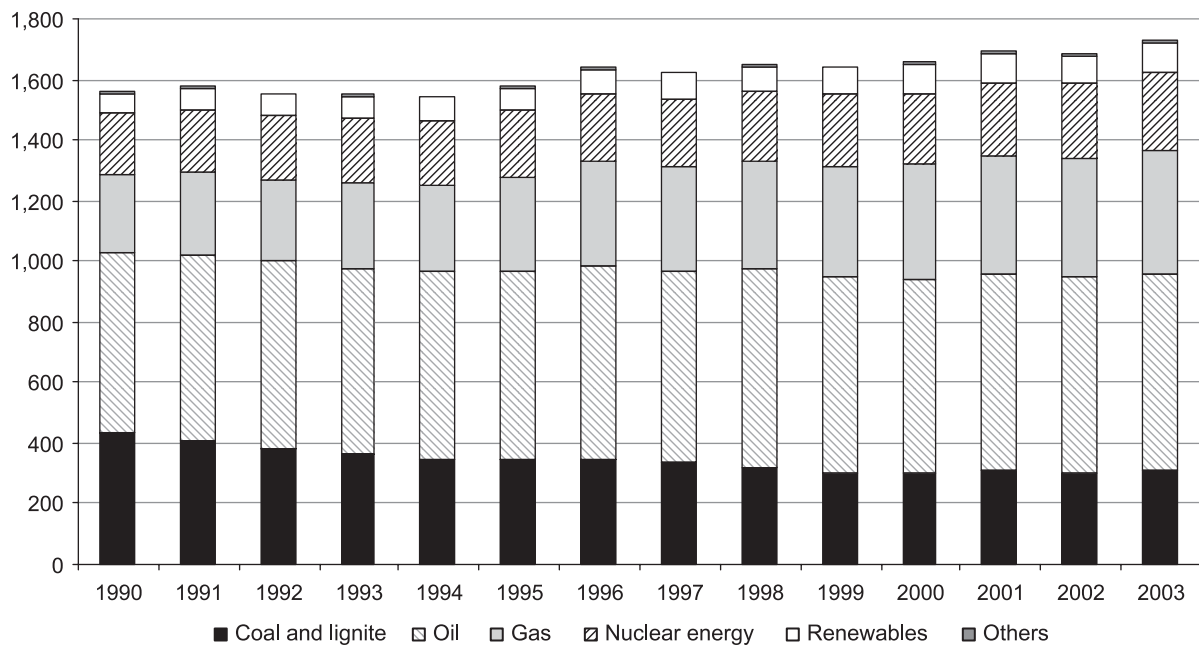


Figure 8. Gross inland consumption of energy in the EU-25, by fuel (million tons of oil equivalent).
Source: Eurostat.

biodiversity, human health, numerous economic sectors, as well as global poverty.

3.6. Production and consumption patterns. A new path to an eco-efficient economy

The goal of sustainable production and consumption is to decouple resource use and generation of environmental pollution from GDP growth. This is possible through more efficient use of natural resources, thus creating more from less, and by requiring the main actors, such as enterprises, public authorities and consumers, to contribute to the changes.

The current headline indicator, domestic material consumption (DMC)¹¹ versus GDP, is intended to represent the amounts of material consumed by EU countries, although there are some methodological shortcomings (see Figure 9). Domestic material consumption (DMC) decreased during the period 1990–1993, due mainly to the weak economic growth in the EU at the time and to the restructuring of east German industries, but has since then stabilized while GDP has steadily increased. This indicator shows a relative, but not absolute, decoupling of environmental pressure from economic growth, reflecting the relative decline in manufacturing and the rise of services in the EU economy. However, the indicator does not include all

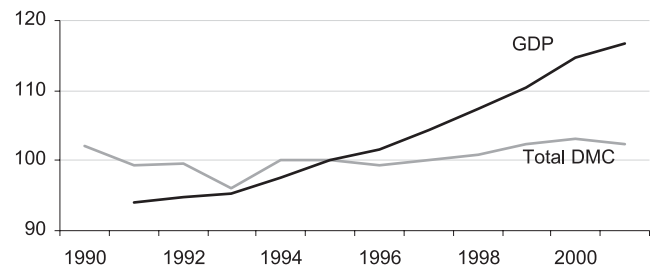


Figure 9. Domestic material consumption versus GDP in the EU-15 at constant prices, index (1995 = 100).
Source: Eurostat.

the natural resources used to produce goods imported from non-EU countries.

Further analyses of eco-efficiency, consumption patterns, agriculture, and corporate social responsibility describe the contributions of various sectors and stakeholders, but also highlight interaction between internal and external dimensions of sustainable development. This theme has a strong link with energy issues, in particular through the subtheme of consumption patterns.

3.7. Management of natural resources. Halting the decline of biodiversity

Natural resources provide essential life support functions such as food and habitats, carbon and water storage, as well as essential raw materials. Although small changes in the quantity or quality of most stocks of natural resources pose little threat, these changes should not damage the capacity of the environment to continue providing all

¹¹ The indicator domestic material consumption presents the quantity of material consumed by EU countries. DMC equals domestic material input (DMI — i.e., domestic extraction plus extra-EU imports) minus extra-EU exports.

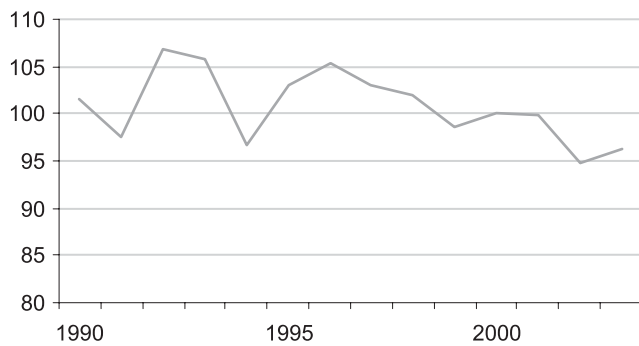


Figure 10. Population trends of selected farmland bird species, index (2000 = 100).

Source: EBCC/RSPB/Birdlife/Statistics Netherlands.

Note: The EU aggregate figure is an estimate based on 16 Member States from EU-25.

essential ecosystem services. The EU sustainability target is to halt the loss of biodiversity by 2010. As it is difficult to measure biodiversity with a single indicator, statisticians have suggested using the population of farmland birds¹² as the headline indicator for terrestrial environments (see Figure 10). It provides a measure of the state of a number of species within one broad category of ecosystem, farmland. Since the selected species of birds are strongly dependent on farmland for survival, the indicator can be considered to reflect the biodiversity of this ecosystem in general, and more specifically to reflect habitat loss and the sustainability of farming practices. The index of farmland bird population trends decreased significantly between 2000 and 2003, indicating that there has been a fall in the populations of a number of species.

The EU has also set a target for the protection of fish resources to halt the decline of remaining stocks by 2015 (see Figure 11). The second headline indicator for the management of natural resources: fish catches taken from stocks that are considered to be outside the safe biological limit (SBL),¹³ shows that a considerable proportion of the catch in EU-managed waters is made from stocks that are already below their SBL in 2003. Despite measures to reduce the fishing fleet, there is as yet no sign of slackening.

Changes in terrestrial and aquatic ecosystems are due to complex socio-economic and environmental developments and are therefore closely related to the following themes:

¹² The indicator is an aggregated index of estimated population trends in a selected group of bird species that depend on agricultural land for nesting or breeding. It is indexed on the year 2000. Indices are calculated for each species independently and are weighted equally when combined in the aggregate index using a geometric mean. Aggregated EU indices are calculated using population-dependent weighting factors for each country and species.

¹³ This indicator relates to the catches of a number of fish species that have been assessed to be outside safe biological limits. In general terms, it is considered that a fish stock is within safe biological limits if its current biomass is above the value corresponding to a precautionary approach advocated by the International Council for the Exploration of the Sea (ICES).

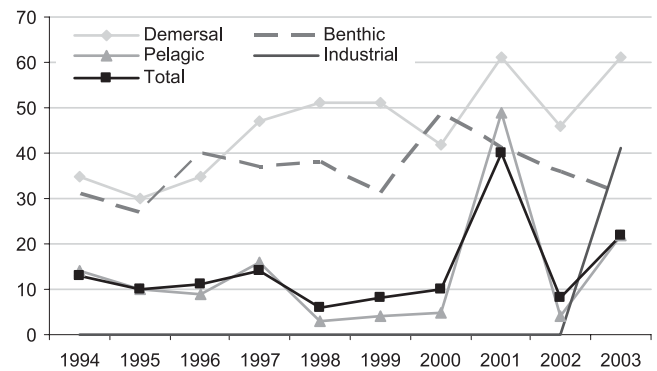


Figure 11. Fish catches from stocks outside safe biological limits, in percent.

Source: Eurostat.

economic development; climate change and energy; production and consumption patterns; transport; and global partnership.

3.8. Transport. Striving for decoupling and restructuring

Transport has an important role to play in providing access to community services and supporting healthy economic development in both rural and urban areas. Nevertheless, growth in the transport sector is a major contributor to congestion, air pollution, noise, and ecosystem fragmentation, which in turn lead to the impairment of human health and that of the environment.

Significant decoupling of transport growth from GDP growth is an important goal of the SD strategy: economic growth needs to be less dependent on transport.

It is difficult at present to construct a robust indicator showing transport growth — which ideally would show vehicle-kilometres — versus GDP. The proxy indicator, energy consumption by transport¹⁴ versus GDP (see Figure 12), indirectly shows the increase in the volume of

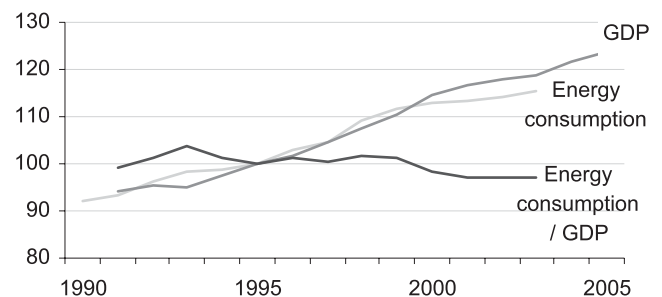


Figure 12. Energy consumption of transport, and GDP, in the EU-15, index 1995 = 100.

Source: Eurostat.

¹⁴ The indicator is expressed as the energy consumption by all transport modes, i.e., rail, road, air, inland navigation (final energy consumption) and marine bunkers.

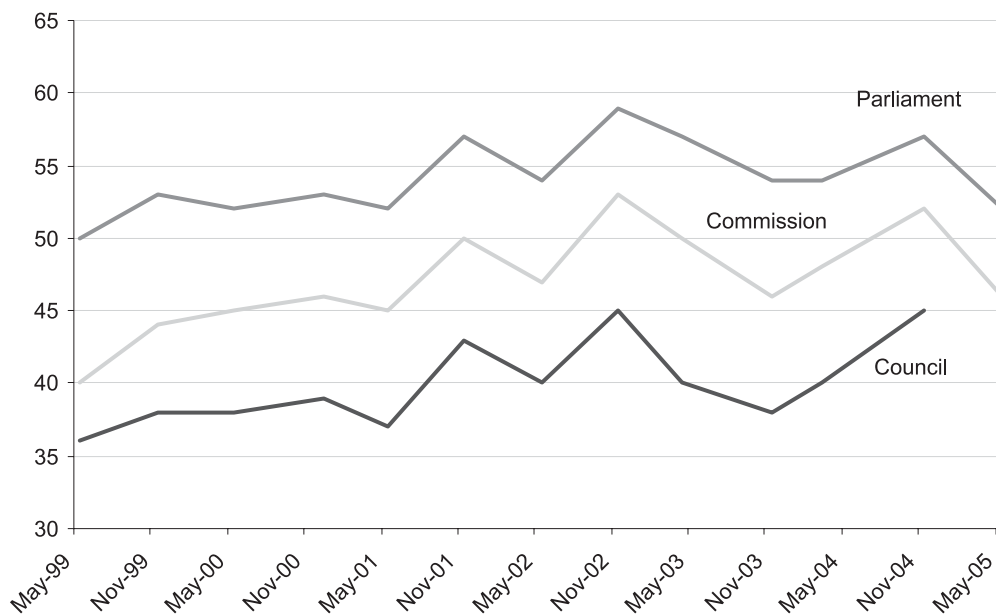


Figure 13. Level of citizens' confidence in EU institutions (in percent).

Source: European Commission, Eurobarometer opinion poll.

transport, and illustrates that, despite the increase in the fuel efficiency of new vehicles, energy use by transport has increased by 14.4% in the EU-15 since 1995, while the GDP has risen by 16.0%. These figures show that no significant decoupling has been achieved.

Further analyses relate to transport growth and the environmental impact of transport that are linked to improved mobility and changes in socio-economic, environmental and health conditions. The energy consumption of transport is one of the main components of Gross Inland Consumption of energy, and contributes significantly to greenhouse gas emissions.

3.9. Good governance. Emphasis on citizens and policy coherence

Modern, open and citizen-oriented institutions are considered essential for the European Union. Improving policy coherence and providing better information, widespread participation, and strong leadership are proposals for EU sustainable development.

The headline indicator, levels of citizens' confidence in EU institutions,¹⁵ is taken from the standard *Eurobarometer* opinion poll organized twice a year by the European Commission. The trust of citizens in the EU institutions has been rising over the period 1999–2004, but preliminary results from May–June 2005 show that confidence in the European institutions fell significantly during the first half

of 2005 to return approximately to the levels observed in May 2000 (Figure 13). There is a great stability in the ranking of the three institutions in terms of public confidence, with the European Parliament having most confidence, followed by the European Commission and the European Council.

Two subthemes allow further analysis in the areas of policy coherence and participation, which are essential conditions for the advancement of sustainable development in the EU. In the same way as good governance is a prerequisite for sustainable development, public confidence in EU institutions is a necessary condition for the successful implementation of most EU policies. There is therefore an indirect link with most other themes.

3.10. Global partnership. Towards new modes of cooperation

The interdependency between countries has considerably increased over the last two decades. At the Millennium Summit in 2000, the EU together with other nations acknowledged their global responsibility for concerted action leading towards a better world. The EU is committed to taking a leading role in the pursuit of global sustainable development.

This theme refers to six priorities,¹⁶ of which the headline objective for the priority of financing sustainable

¹⁵ The indicator is defined as the share of the population that tends to trust the European Parliament, the European Commission and the Council of Ministers.

¹⁶ The six priorities are: harnessing globalization; fighting poverty and promoting social development; sustainable management of natural and environmental resources; coherence of EU policies; better governance at all levels; and financing sustainable development.

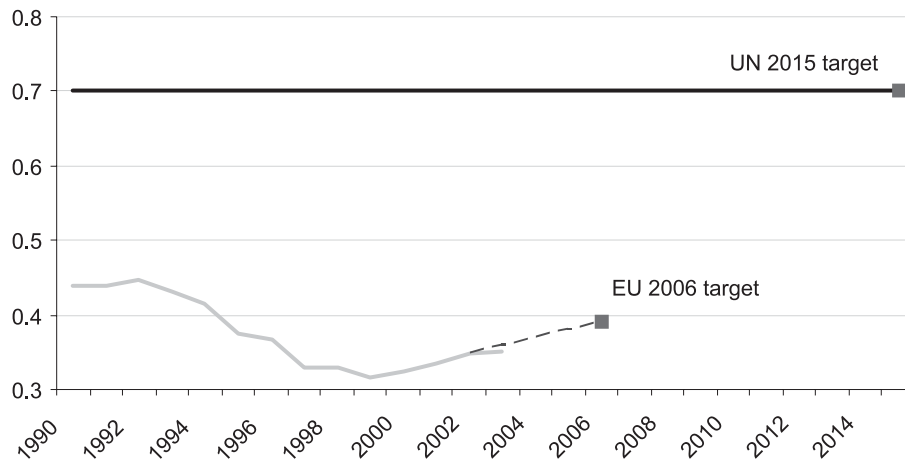


Figure 14. EU-15 official development assistance (ODA) as a percentage of gross national income.
Source: OECD.

development is to help developing countries to obtain the necessary financing for the attainment of the Millennium Development Goals. The EU objective is to reach the United Nations goal of contributing 0.7% of its gross national income (GNI) towards official development assistance (ODA) (see Figure 14). Member States lagging behind this goal are requested to increase their ODA by 2006 to at least 0.33%, so that an EU collective average of 0.39% can be reached by 2006. In 2003, the EU average was 0.35%, which is well above the average for all donor countries, of 0.23%. The increasing trend observed over the period 2000–2003 puts the EU on track to achieve the EU target of 2006, but significant further efforts will be necessary to reach the UN target.

Subthemes focus on globalization of trade, financing for development, and resource management. These are interwoven, especially with the themes of economic development, and production and consumption patterns. There is also a link with energy issues, for example when looking at the proportion of energy imported into Europe, or comparing CO₂ emissions per capita in the EU and developing countries. Furthermore, the tighter interdependence between the EU and developing countries also sets new requirements to ensure that current trends in the loss of environmental resources will be effectively reversed at national and global levels by 2015.

4. Comparison between SDIs and EISDs

The EU sustainable development strategy covers a broad spectrum of issues, which is reflected in the ten themes of the framework of sustainable development indicators. Energy is included as a subtheme, but it is not the main focus as in the energy indicators for sustainable development (EISD) initiative, which proposes a greater number of energy-specific indicators and provides more in depth information on energy issues (IAEA *et al.*, 2005).

For the purpose of comparing the two sets of indicators, it is also useful to keep in mind that the EISD are covering energy issues at a global level, including developing countries which may need a different focus of information and advice. EU policy is obviously adapted to the European context, with its own priorities and specificities. EU energy policy emphasizes, in particular, issues related to GHG emissions, energy efficiency and renewables, which is reflected in the SDI energy subtheme.

The SDI framework brings together climate change and energy issues as one theme, given the close relationship between the two. The headline indicator for the climate change subtheme is total GHG emissions, which addresses the main policy objective of the Kyoto Protocol. These GHG emissions are further disaggregated at Level 2 by IPCC sector, which includes energy, and at Level 3, CO₂ intensity of energy consumption, as well as CO₂ removed by sinks, help analyse the trends further.

In the energy subtheme, gross inland energy consumption per fuel is the headline indicator, with Level 2 including energy intensity per GDP, energy consumption by sector and electricity generation by fuel used in power stations. Level 3 indicators include the share of renewable energy, the combined heat and power generation as a percentage of gross electricity generation, the energy intensity of the manufacturing industry, the consumption of bio-fuels in transport, the external costs of energy use and the energy tax revenue.

The EISD propose a wider set of energy indicators; the SDIs on energy can be seen as a subset of these, but the overlap is not complete. Several SDIs are expressed in absolute terms, which is more useful in the context of EU policy-making. The EISD tend to use a normalized approach, which improves comparability between nations. For example, the SDI Level 1 indicator on gross inland consumption by fuel becomes energy use per capita (ECO1) in the EISD. The SDI Level 2 indicators, energy consumption by sector and electricity generation by fuel used in

power stations, become energy intensities (ECO6 to ECO10; energy intensities are also used in the SDI Level 3 for the manufacturing industry) and, fuel shares in energy and electricity (ECO11). Whereas the EISD on efficiency of energy consumption and distribution (ECO3) takes a broad view on energy efficiency, the SDIs look specifically at co-production in the Level 3 indicator, combined heat and power generation as percentage of gross electricity generation. This is because co-production is considered an important element of energy efficiency improvement in the context of the EU.

In a broad international context, the relevance of the energy price is twofold: reduced consumption versus affordability (ECO14 in EISD: end-use energy prices by fuel and by sector). In the EU context, the focus is more on the contribution of energy taxes to the reduction of energy consumption, an aspect which is not uncontroversial (SDI Level 3, energy tax revenue at constant prices and energy consumption).

5. Conclusion

Sustainable development is by nature a multidimensional issue. The EISDs do acknowledge the different dimensions of sustainable development through the use of a framework encompassing the economic, social and environmental dimensions. Sustainable energy use needs to be considered within the wider picture, as there are multiple linkages and feedback effects: energy use influences other policy areas relevant to sustainable development, and vice versa, as the analysis of the SDI themes demonstrates. The two sets of indicators can therefore be seen as complementing each other, the EISD giving a more in-depth picture of the energy sector, while the SDIs provide a broader picture and address many other aspects of sustainable development, with a specific focus on EU priorities. They also serve different purposes, and reflect different policy areas, at different geographical and political levels, which sets a limit to the amount of integration that can usefully be achieved.

There is a need for further research and a more in-depth analysis of linkages between each of the SDI themes, and in particular with the energy subtheme. This is essential to identify the potential synergies and trade-offs linked to energy-related policy instruments for sustainable develop-

ment. There is also a need for further developing indicators in the SDI energy subtheme, and for improving data availability and quality. The issue of external costs of energy use in particular needs further development before a useful indicator can be produced. A strong focus on energy in the revision of the sustainable development strategy should provide a useful impulse for further research in these areas.

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