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COVER NOTE

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Delegations will find attached document SWD(2013) 303 final Volume 2 of 2.

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Progress on 'GDP and beyond' actions

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Progress on 'GDP and beyond' actions

Annexes

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ANNEX 1
STRENGTHS AND WEAKNESSES OF GDP

Together with unemployment rate, government debt, inflation and population, gross domestic product (GDP) is the one of the most prominent and best known statistical indicators. It is a result produced from/in national accounts (NA), the macro-economic 'book-keeping' with its origins in the macro-economic theory of the 1930s but which has constantly evolved and been refined over the years[1]. NA and GDP have both strengths and weaknesses:

Strengths: Economic monetary flows between institutional units (such as companies and households) and assets stocks and liabilities define the core of NA. As these flows and stocks are observable and measurable by robust statistical methods, a consensus emerged from the first decades of experience with this macro-economic accounting, which was enshrined in a statistical 'standard' at UN level, the **System of National Accounts (SNA)**, in 1953.

Weaknesses: Major difficulties with this approach relate to economic issues at the edge of the system, such as calculating the depreciation of (in particular, natural) assets. Furthermore, some specific non-market phenomena (e.g. household-produced services for own consumption) are not taken into account. Depending on the structure of a country's economy, this part of production can be very significant.

The scope of the SNA has been broadened significantly over the past few decades. The recent version of the **UN 'SNA 2008' Standard** and its European version the **European System of Accounts 2010** have lifted a great number of restrictions that limited the usefulness and functionality of NA in the past, e.g. the capitalisation of research and development expenditure, and the provision of extensive data on pension systems. Consequently, this system of macro-economic statistics is today used as the basic set of quantitative information in an even wider range of political and research applications.

The fact that it is based on a standardised UN concept guarantees a unique level of statistical quality and in particular comparability between countries. However, **the use of GDP sometimes goes (far) beyond the purposes for which NA were designed**.

There are two closely related components of misuse. First, the measured part of reality (e.g. GDP) is taken as a measure of the welfare of a country or a proxy for all other, non-measured phenomena. Secondly, economic growth (measured in GDP growth) is interpreted as overall societal progress. These misinterpretations lead to serious political consequences, as decisions can be based on inadequate evidence and biased reading of the facts.

Against this background, the international statistical community has tried to find mitigating tools for these problems. Already in the 1960s, **social accounting concepts** were developed to fill the gaps in national accounts as regards distributional issues. As of the 1970s, the **environmental problems** were addressed in early conceptual studies and working groups at international level. This led to the 'core' NA being accompanied by

[1] http://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf, chapter 1, sections D and H

complementary accounts using the same concepts and covering topics like health, education and the environment. However, these complementary accounts have not yet been used to develop commonly accepted macro-indicators.

Table 1: Europe 2020 strategy headline indicators and targets – EU-27

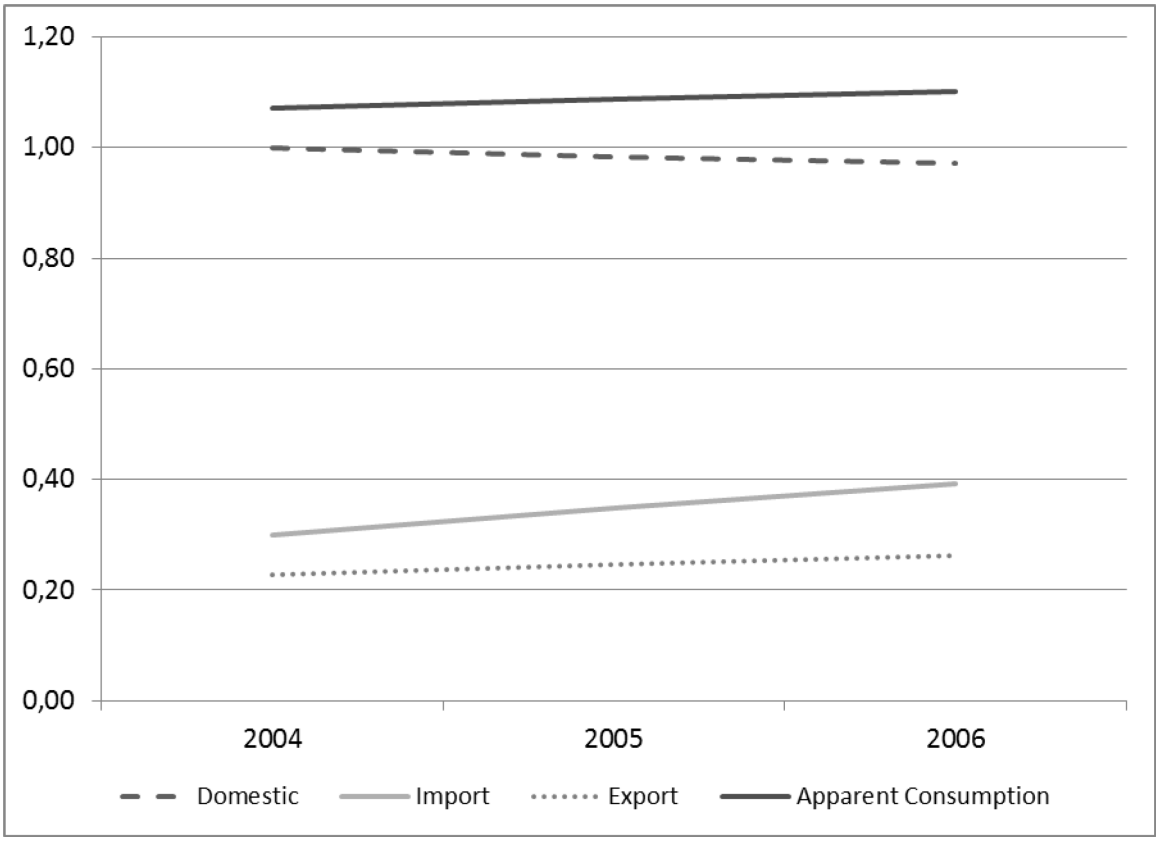
	Indicators	2005	2006	2007	2008	2009	2010	2011	2012	Target
Employment	Employment rate [1]									
	(% of population aged 20-64)	68.0	69.0	69.9	70.3	69.0	68.6	68.6	:	**75**
	- female	60.0	61.1	62.1	62.8	62.3	62.1	62.3	:	
	- male	76.0	76.9	77.8	77.9	75.8	75.1	75.0	:	
R&D	Gross domestic expenditure on R&D									
	(% of GDP)	1.82	1.85	1.85	1.92[s]	2.02[s]	2.01[s]	2.03[s]	:	**3**
Climate change / energy	Greenhouse gas emissions									
	(Index 1990=100)	93	93	92	90	84	86	83[e]	:	**80**
	Share of renewable energy in gross final energy consumption									
	(%)	8.5	9.0	9.9	10.5	11.7	12.5	:	:	**20**
	Primary energy consumption									
	(billion tonnes of oil equivalent (Gtoe))	1.70	1.71	1.69	1.68	1.60	1.65	:	:	1.47
Education	Early leavers from education and training									
	(% of population aged 18-24)	15.8	15.5	15.0	14.8	14.3	14.0	13.5	12.9[e]	**< 10**
	- female	13.8	13.4	12.9	12.8	12.4	12.1	11.6	11.1[e]	
	- male	17.8	17.5	17.0	16.8	16.2	15.9	15.4	14.6[e]	
	Tertiary educational attainment									
	(% of population aged 30-34)	28.0	28.9	30.0	31.0	32.2	33.5	34.6	35.5[e]	**≥ 40**
	- female	30.0	31.5	32.8	34.2	35.6	37.2	38.5	39.6[e]	
	- male	26.0	26.3	27.2	27.9	28.8	29.9	30.8	31.5[e]	
Poverty or social exclusion	People at risk of poverty or social exclusion [2] (million)	123.9[e]	122.6[e]	119.2	115.6	113.7	116.3	119.5[e]	:	**20 mio less**
	People at risk of poverty or social exclusion [2] (%)	25.6[e]	25.2[e]	24.4	23.6	23.1	23.6	24.2[e]	:	
	People living in households with very low work intensity (%)	10.3[e]	10.5[e]	9.6	9.0	9.0	10.0	10.0[e]	:	
	People at risk of poverty after social transfers (%)	16.4[e]	16.5[e]	16.5[e]	16.4	16.3	16.4	16.9[e]	:	
	Severely materially deprived people (%)	10.7[e]	9.8[e]	9.1	8.4	8.1[e]	8.3	8.8[e]	:	

Notes: (1) 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; (2) People covered by at least one of the three sub-indicators

Source: Eurostat and EEA [official 2011 GHG data available from 27.5.2013]

(see Section III.4)

Figure 1: Overall environmental impact indicator (global perspective), EU-27



Source: European Commission, 2012. *Life cycle indicators for resources: development of life cycle based macro-level monitoring indicators for resources, products and waste for the EU-27*, European Commission, Joint Research Centre, Institute for Environment and Sustainability[2]

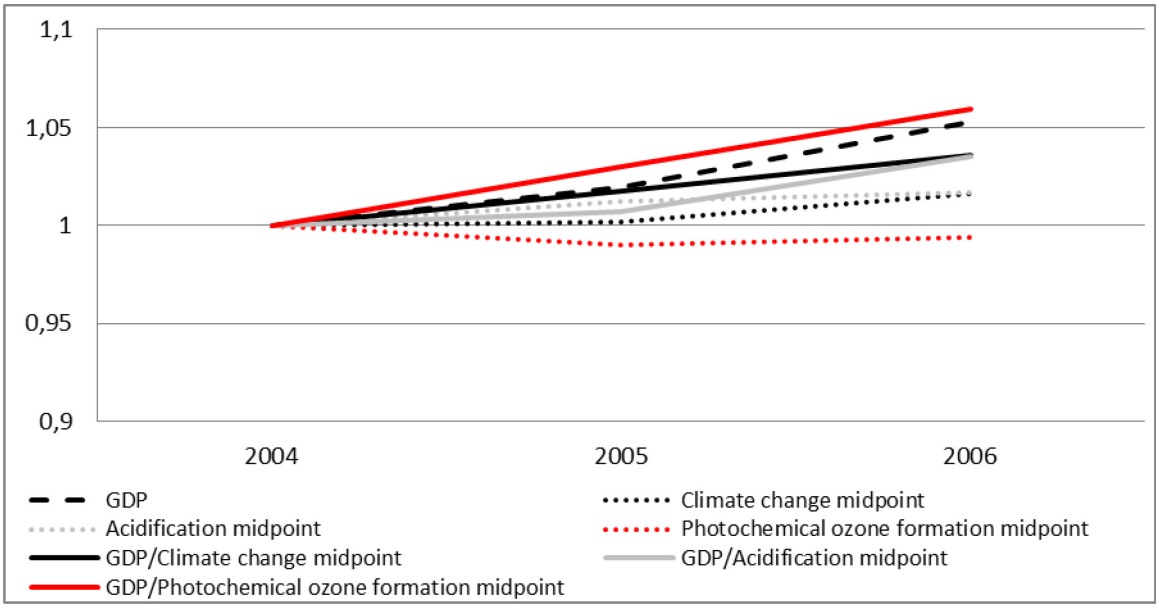
A project-specific weighting scheme was developed for the aggregation into a single figure.[3]

(see Section III.1.1)

[2] http://lct.jrc.ec.europa.eu/pdf-directory/LBNA25517ENN.pdf.

[3] Huppes, G., van Oers, L. (2011): *Evaluation of Weighting Methods for Measuring the EU-27 Overall Environmental Impact*. JRC Scientific and Technical Reports. European Commission, Joint Research Centre, Institute for Environment and Sustainability http://lct.jrc.ec.europa.eu/pdf-directory/ReqNo-JRC67216-LB-NA-24985-EN-N.pdf.

Figure 2: Normalised eco-efficiency indicators (global perspective), EU-27



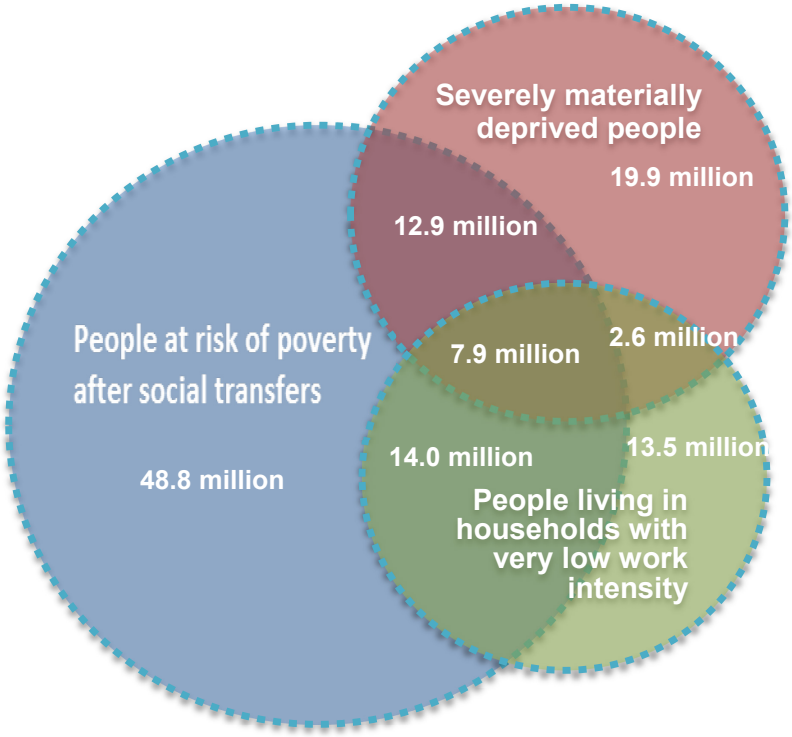
Source: European Commission, 2012. *Life cycle indicators for resources: development of life cycle based macro-level monitoring indicators for resources, products and waste for the EU-27*, European Commission, Joint Research Centre, Institute for Environment and Sustainability[4]

The environmental impact indicators (life-cycle indicators with global perspective) were developed on the basis of the life-cycle impact assessment methods recommended in the International Reference Life Cycle Data system (ILCD)[5].

[4] http://lct.jrc.ec.europa.eu/pdf-directory/LBNA25517ENN.pdf.

[5] ILCD Handbook — General guide for Life-Cycle Assessment — detailed guidance. European Commission, Joint Research Centre, Institute for Environment and Sustainability, 2010. http://lct.jrc.ec.europa.eu/pdf-directory/ILCD-Handbook-General-guide-for-LCA-DETAIL-online-12March2010.pdf
ILCD Handbook — Recommendations for Life-Cycle Impact Assessment in the European context. European Commission, Joint Research Centre, Institute for Environment and Sustainability, 2011. http://lct.jrc.ec.europa.eu/assessment/pdf-directory/Recommendation-of-methods-for-LCIA-def.pdf.

Figure 3: People at risk of poverty or social exclusion, EU-27, 2011



Note:

Total: People at risk of poverty or social exclusion — 119.6 million persons

People covered by at least one of the three sub-indicators:

Severely materially deprived people — 43.3 million

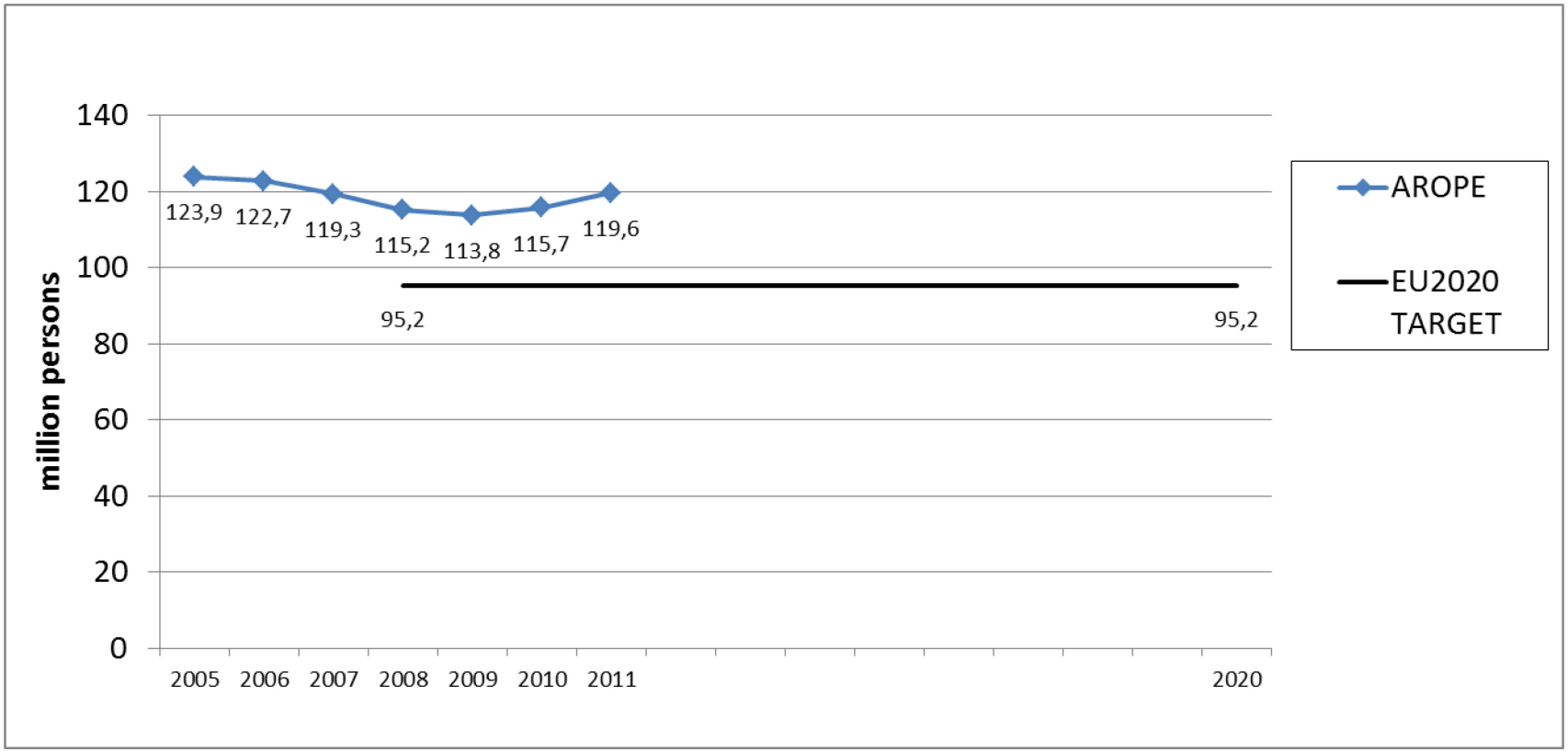
People at 'risk of poverty' after social transfers — 83.6 million

People living in households with very low work intensity — 38 million

Source: Eurostat (online data code t2020_50, t2020_51, t2020_52; t2020_53 and ilc_pees01)

(See Section III.1.2.1)

Figure 4: People at-risk-of-poverty or social exclusion (AROPE), EU-27

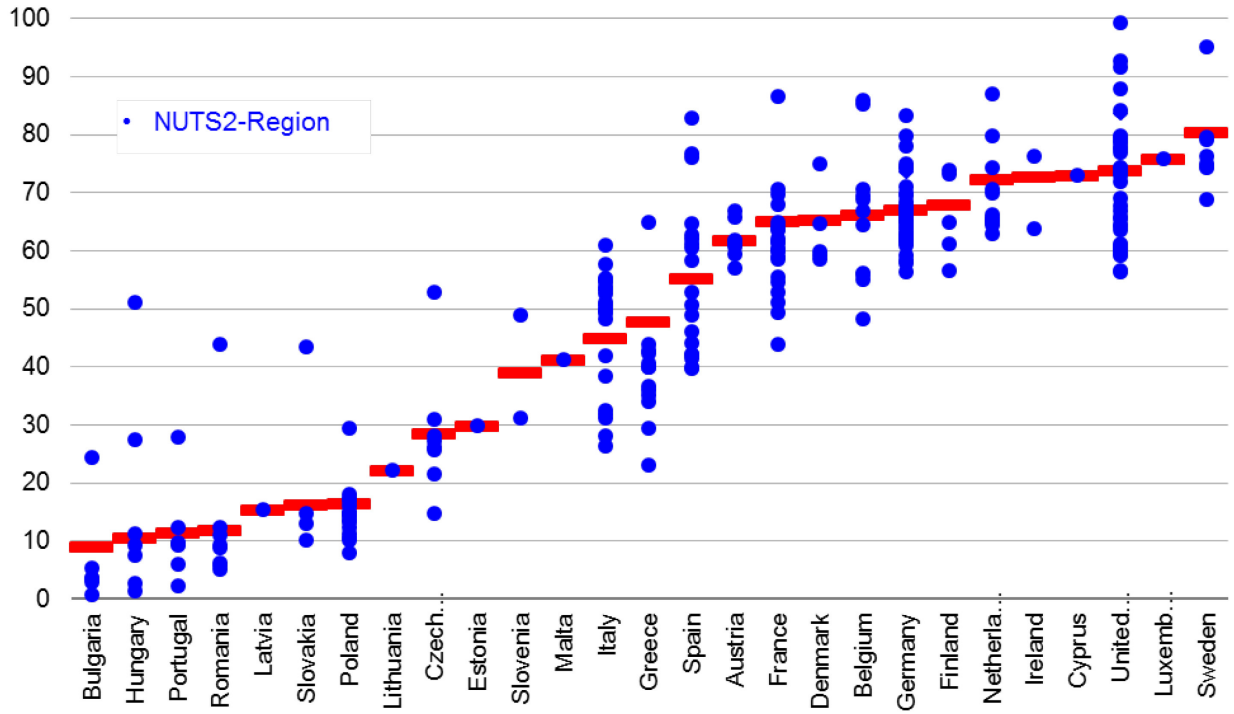


Source: Eurostat (t2020_50),

Note: *2005, 2006 and 2010 data are Eurostat estimates*

See Section III.1.2.1

Figure 5: EU national and regional Human Development Index, 2008

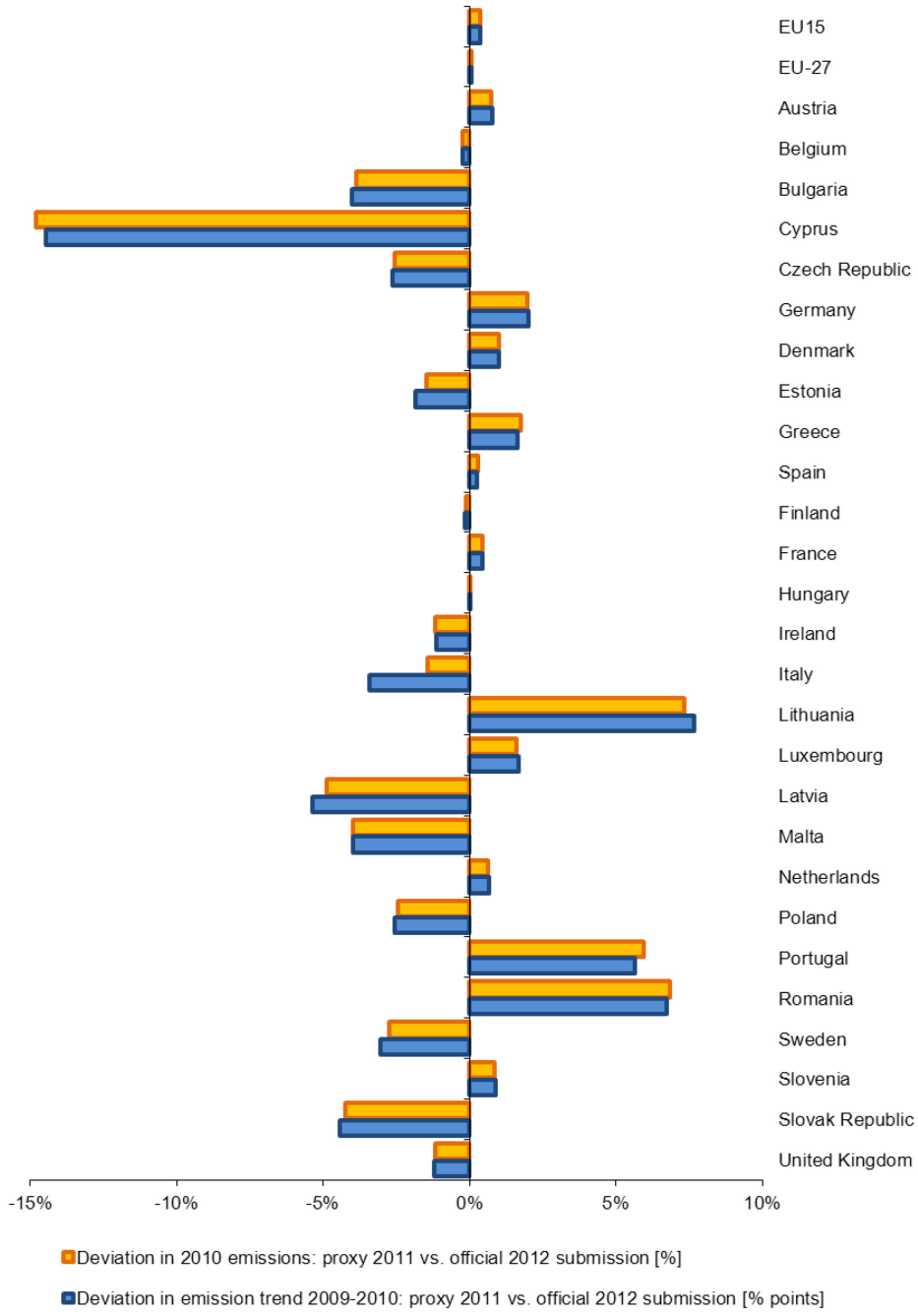


Source: Eurostat and calculations by the DG for Regional and Urban Policy

Note: UN methodology has been modified to take into account the EU context and regional data availability, e.g. the country values are not the same as for the original HDI. The purpose of the EU-HDI is to compare EU countries and regions. Therefore, the value 100 was given to the region with the highest level (see United Kingdom) and 0 to the region with the lowest level (see Bulgaria). For methodology, see Regional Focus 02/2011, The European regional Human Development and Human Poverty Indices *by Rocco Bubbico and Lewis Dijkstra http://ec.europa.eu/regional_policy/information/focus/index_en.cfm*

(see Sections III.1.2.1 and III.3.1)

Figure 6: 2010 Kyoto greenhouse gas emissions: difference between 'early estimate' (of 2011) and final official data (of 2012)



Source: EEA, Approximated EU GHG Inventory: early estimates for 2011

Note: The figure shows the difference or deviation between the 'early estimates' (Approximated GHG Inventory) as published in 2011 and the final official data submitted to UNFCCC in 2012. The 'early estimates' are based on national methodologies and emission factors used by Member States in their official submissions to the UNFCCC the year before. Ongoing improvements in Member State data take effect and are an important cause of deviation between the early estimates and the final data. The lack of activity data for some key emission sources is also a relevant source of uncertainty in the estimates.

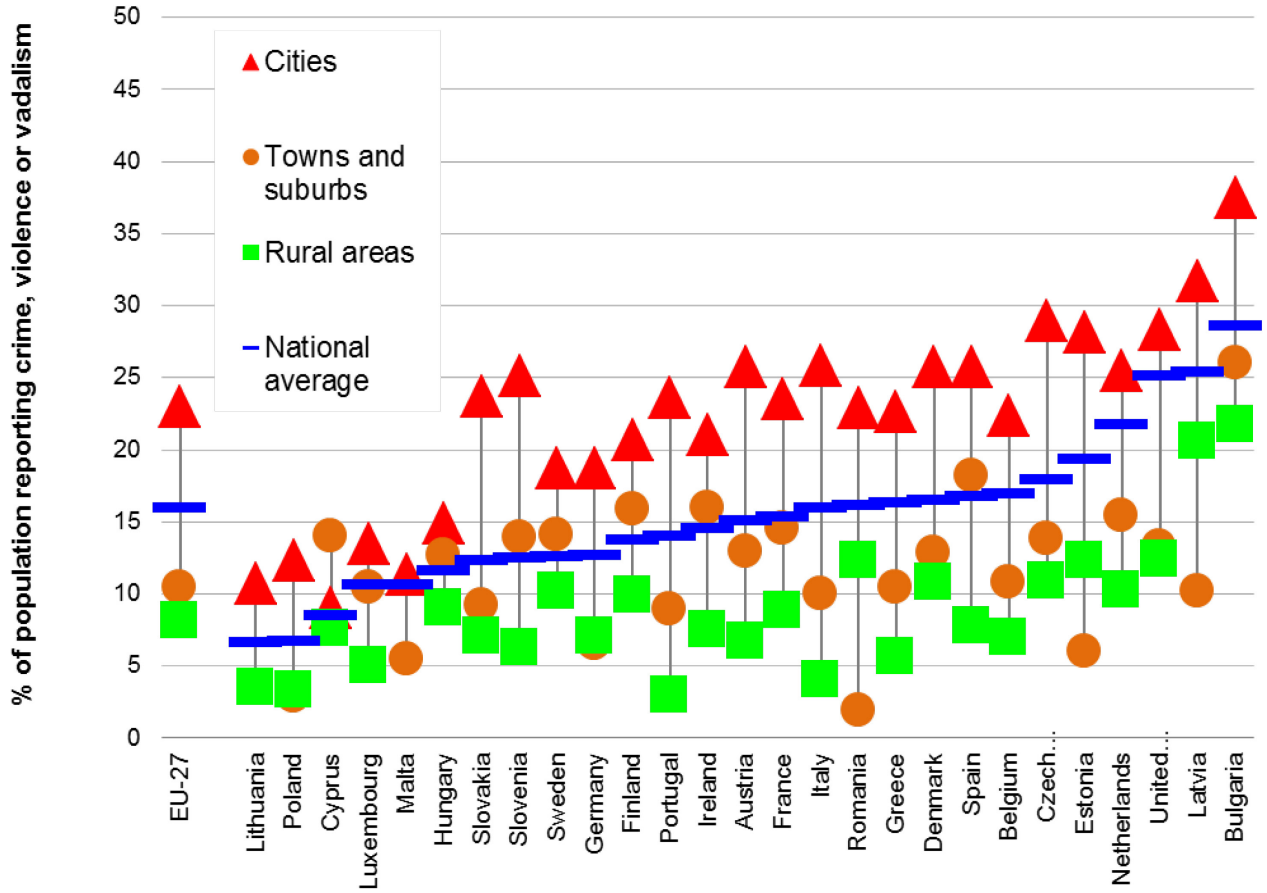
However, the differences for EU-15 and EU-27 were (far) below 1 % and for the large majority of 22 MS below 5 %.

The IPCC Good Practice Guidance recommends continuous improvement of data. Therefore MS may change methodologies in order to improve their greenhouse gas emissions data. Such methodological changes at MS level cannot be predicted in the calculation of the approximated GHG inventory the year before. (For full details see pages 49-57 of the report[6].)

(See Section III.2.1)

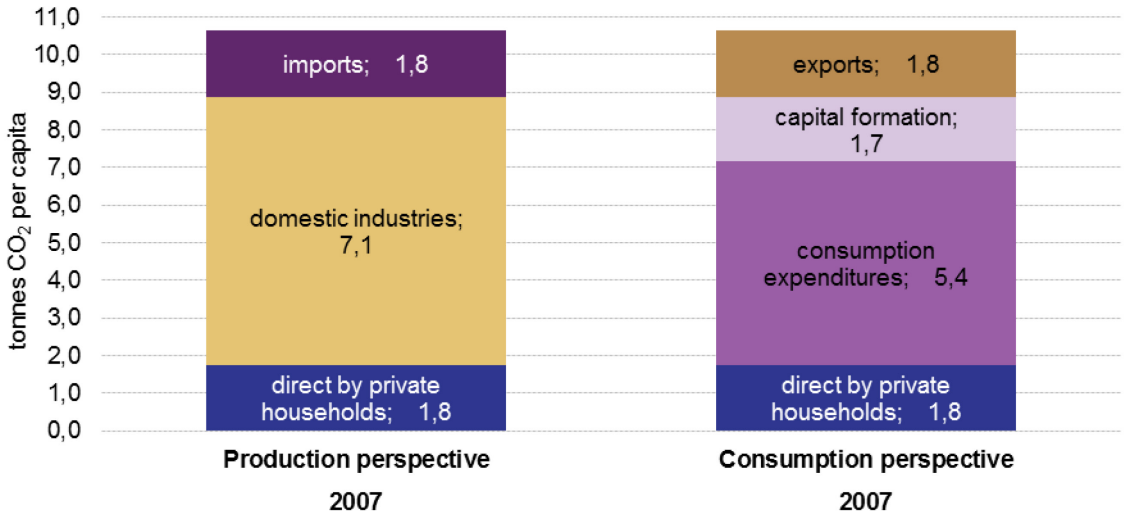
[6] http://www.eea.europa.eu/publications/approximated-eu-ghg-inventory-2011.

Figure 7: Crime, violence and vandalism by degree of urbanisation, 2009



Source: Eurostat (SILC)

Figure 8: CO_2 emissions per inhabitant — production and consumption perspective, EU-27



Source: Eurostat (online data codes: env_ac_ainacehh and env_ac_io

The bar on the left shows CO_2 emissions from a production perspective. It is composed of three elements. Private households emitted 1.8 [1.9][7] t/cap CO_2 along with the 'production' of warm flats (heating their homes) and mobility services (private cars). EU industry's domestic production of all goods and services put on markets (be it for consumption in Europe and/or exports) emitted 7.1 [7.2] t/cap CO_2. Thirdly, CO_2 emissions by industries in the rest of the world from the production of goods which were imported into EU were estimated at 1.8 [1.7] t/cap.

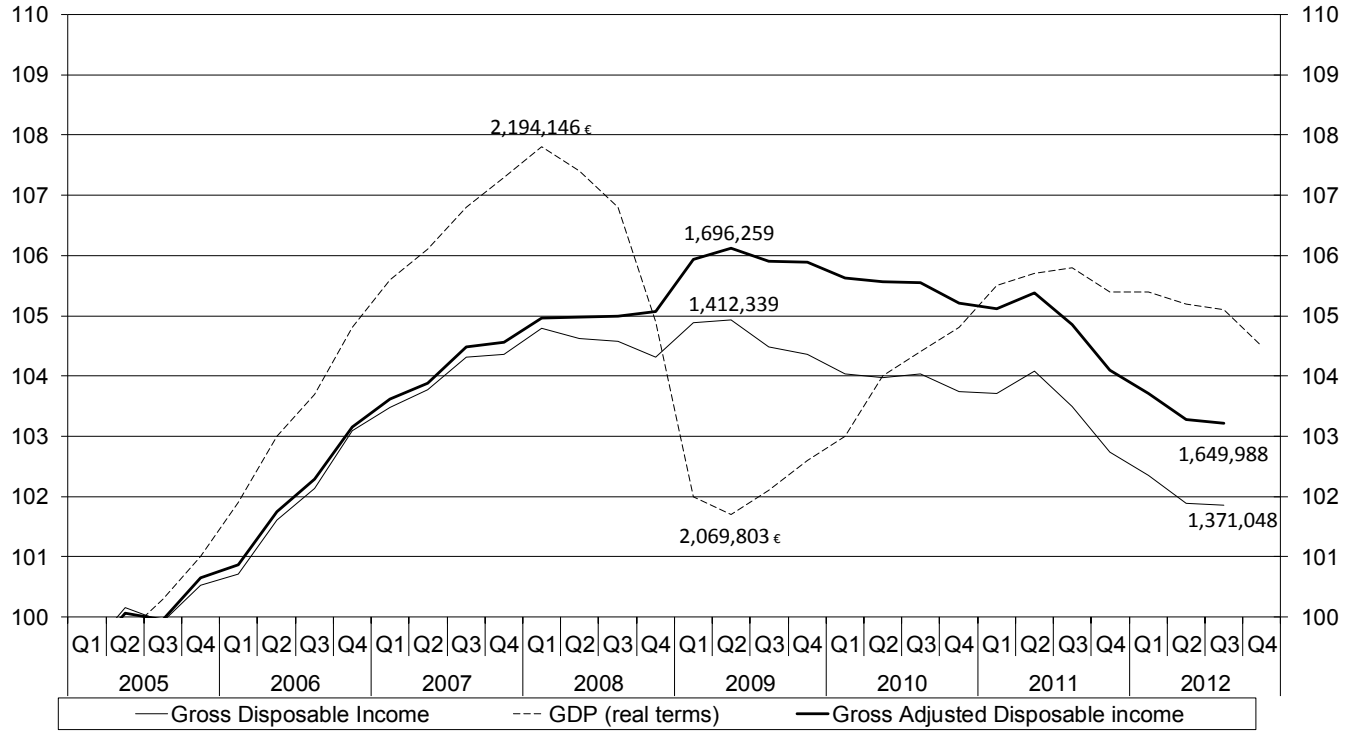
The bar on the right shows the same CO_2 emissions from a consumption perspective. Private households emitted 1.8 [1.9] t/cap CO_2 in order to 'consume' the warm flats (heating) and mobility (private cars) they 'produced'. In addition, private households consumed domestically produced and imported goods and services which 'incorporated' an estimated 5.4 [5.6] t/cap CO_2. Some of the domestically produced and imported goods were used for capital formation in the EU (infrastructures, equipment); these incorporated 1.7 [1.6] t/cap CO_2. Finally, the goods and services exported out of the EU were estimated to incorporate 1.8 [1.6] t/cap CO_2. Further details can be found in the publication *CO_2 emissions induced by EU's final use of products are estimated to be 9 tonnes per capita*[8].

A series of research projects has helped to build up the data base for this and other footprint type indicators, including EXIOPOL, WOID and OPEN-EU. Extensions and refinements are ongoing with the projects CREEA, DESIRE and CARBON CAP (see Annex 7).

[7] [2006 numbers in brackets].

[8] Statistics in Focus, issue number 22/2011 (http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-11-022/EN/KS-SF-11-022-EN.PDF).

Figure 9: Cumulated growth of GDP, Gross Disposable Household Income and Gross *Adjusted* Disposable Household Income, Euro Area



Source: Eurostat (online data codes: namq_gdp_k, namq_gdp_p and nasq_nf_tr) [absolute values to be checked]

Note: in volume/real terms, seasonally adjusted, 2005=100; Adjusted household income includes social transfers in kind (STIK)

ANNEX 3
FROM DATA TO INDICATORS — A EUROSTAT PERSPECTIVE

1. The interplay of different actors

Indicators[9] could be described as quantitative variables measured or calculated which, individually or as part of a set, allow us to obtain as much valid empirical information as possible on a specific matter, so they serve a **specific purpose**.

An **indicator set** is a compilation of indicators which should cover a broader field of application or a political area. **Macro-indicators** are at the top of the **pyramid of statistics** (see figure A). At the same time, they are quite a heterogeneous group. Most of them are related to a specific policy framework (Macro-economic Imbalance Procedure (MIP), Excessive Deficit Procedure (EDP), Europe 2020 strategy), but some are related to an important phenomenon without a direct link to an explicit policy framework (globalisation).

Often there are synergies between indicators belonging to different indicator sets, i.e. the same individual indicator is used in several sets. This is the case, for example, with the Europe 2020 indicators and the SDI. The entire set of indicators has to be relevant. The ultimate goal of an indicator set is to show us the reality in all its complexity: the state of our society, its social, economic and ecological connections and its development over time and space. The process of setting indicators should mirror and explain this complexity so that, at the end, citizens are able to recognise themselves in the data presented.

Indicator construction — in particular for measuring such a broad and complex issue as societal progress — is a process involving **various actors** (see figure A) and has to cope with the potentially conflicting goals of different disciplines: a balance must be struck between statistical measurability, scientific consistency, credibility/objectivity and political relevance. The responsibility for indicator definition and use lies with the policy-makers; the statistical system guarantees the quality of the underlying data.

The base of the **political pyramid** comprises a broad block of individual actions to organise life together in society (to create or maintain order). Individual actions may be structured or grouped by their content to represent political goals. To achieve such goals, action packages are adopted. At the general level shown at the top, there is the political programme, characterised by the vision and goals of the policy concerned. The politics pyramid can be applied at different levels (e.g. sub-national, national, international).

At the base of the **data pyramid**, there are the basic data on selected specific topics, which are collected by subject-related surveys or — as in the case of the environment — physical measurements. The basic data are applied in many ways for specialised planning and research. Above them (middle level), there are indicators that are already more aggregated or more selective in terms of subject matter and that are integrated in a set of indicators, e.g. as sub-indicators.

At the same level, there are **the accounting approaches**, where basic data from various sources are integrated in consistent methodical frameworks to give a systematic and more analytical view. The most prominent example of such accounting approaches is national

[9] Terminology relating to the implementation of the 'Vision on the production method of EU statistics'.

accounts; another example is environmental-economic accounting, which describes the interaction between the economy and the environment.

The top level of the pyramid represents a very specific section of statistical information through a very small number of indicators and is occupied by the **key aggregates** and **composite indicators**.

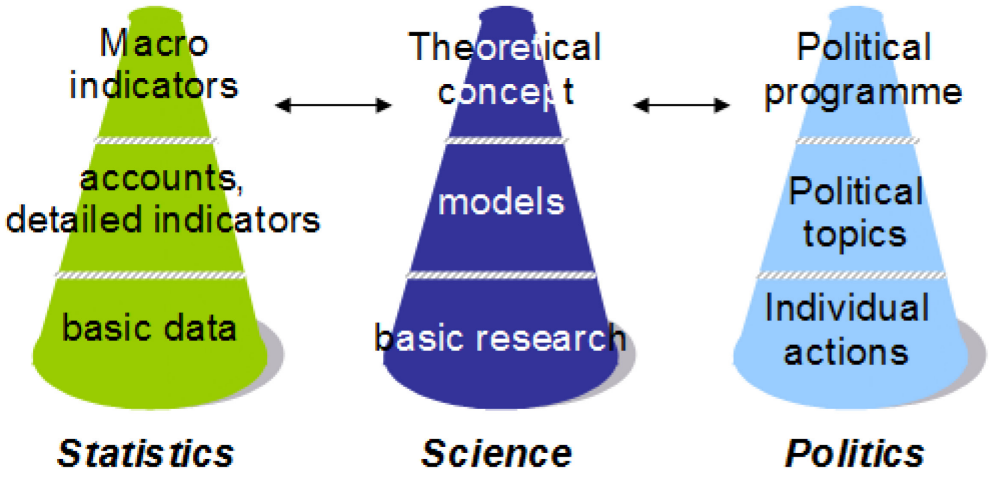


Figure A: Different actors in the process of indicator-setting for policy-making and their work systems[10]

The ideal-type approach to indicator construction involves all three actors and all three pyramid levels and is an iterative decision-making process characterised by discussions between the same pyramid levels and within work systems.

2. Official statistics as core business

The role of official statistics can be seen in all phases of the setting-up and use of indicators and their sets for policy-making. Although responsibility for determining and selecting indicators lies with policy-makers, the involvement of official statisticians early on in the setting-up of statistical support for a policy ensures that good quality indicators are chosen and reduces the risk of using inadequate indicators or incurring additional costs by developing unavailable or low quality indicators.

Once the indicators are determined, the role of official statistics is to provide them, update them regularly and ensure that they meet the necessary quality standards. With the European Statistical System, this requires that sufficient Eurostat and national resources are devoted to quality assurance and that adequate procedures are in place, including audit-like activities where justified. This is the '**production side**' perspective of quality work.

With regard to the '**user side**', the quality of indicators needs to be reported on using easily understandable and accessible metadata. Eurostat quality/indicator profiles currently

[10] Walter Radermacher, *Measuring for the environment,* OECD World Forum, Palermo, 2004.

developed using the ESMS[11] standard for several sets of indicators, including the Europe 2020 indicators, SDIs or environmental indicators, meet these criteria.

Lastly, Eurostat's role[12] in disseminating European statistics for policy-making is also essential. The professional independence of Eurostat and its quality assurance framework should guarantee that the **reliability of statistics** is not questioned, especially where they are used for policy-making involving formal policy procedures and even sanctions.

In specific cases, Eurostat's role goes beyond the dissemination of indicator sets and providing corresponding metadata. Europe 2020 indicators are disseminated together with the numerical values of the headline **targets**, which enables easy assessment of the progress towards the objectives of the strategy. As an independent impartial entity, Eurostat is entrusted by the Commission with preparing the EU Sustainable Development Strategy monitoring report, an in-depth analysis and evaluation of trends relevant to the SDS objectives and targets.

3. Macro-indicators

The **top** of the data pyramid is occupied by **macro- (in some cases referred to as 'summary') indicators**.

Aggregating existing information into macro- or summary indicators involves taking political goals as a guide and taking account of social preferences, gathered through intra-governmental and socio-political consultations. But aggregation has its limits; if taken too far, it could lead to a significant loss of information and/or shift the focus of the discussion from society as a whole to specialised experts. On the other hand, if the level of aggregation is too low, discussion can get bogged down in details ('not seeing the wood for the trees') or focused on too few indicators not covering the whole range of positive and negative impacts of a certain policy. In both cases the correct use of indicators is essential.**Composite indicators (CI)** are a type of macro-indicator *based on component-indicators which initially have no common unit of measurement and for which there is no obvious weighting method.*

The construction of composite indicators involves a number of steps[13]: defining the phenomenon of interest and developing a theoretical/conceptual framework based on thorough literature review and expert knowledge; selecting data on the basis of their analytical soundness, measurability, relevance to the phenomenon; estimating (or not) missing data and dealing with extreme values; assessing the statistical coherence of the dataset; normalising and assigning weights to the component indicators; deciding on the aggregation function; conducting uncertainty and sensitivity analysis to assess the impact of the choices on the final outcome (index scores or values and ranks of countries, sectors, etc.); identifying linkages with other composite (or single) indicators, e.g. GDP or competitiveness; and, finally, presenting the 'measurements' in a sound, transparent and user-friendly way.

However, for each step, choices have to be made on the basis of expert judgment and consensus which may produce indicators that are incompatible with the quality standard of official statistics (e.g. due to a lack of transparency and objectivity). However, by applying

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11 Euro SDMX Metadata Structure (SMDX = Statistical Data and Metadata Exchange).

12 Adopted by the European Commission on 17 September 2012: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:251:0049:0052:EN:PDF.

13 e.g. OECD/EC JRC, 2008, *Handbook on Constructing Composite Indicators. Methodology and user Guide*, OECD Publishing, ISBN 978-92-64-04345-9.

best practice, composite indicators can be constructed so as to inform policy-makers and citizens in a meaningful way about the overall situation and developments in a given policy field[14].

The use of models and imputations when providing official statistics should therefore be kept to a strict minimum and be applied only in specific cases with well-accepted methods (i.e. in NA or for missing values and non-responses in social surveys). Future scenarios (forecasts) certainly need models and assumptions and the research community can use basic data and expertise from official statistics when establishing them. It should be noted that the European Statistical System takes a cautious approach with regard to indicator aggregation, whereby it considers that — as a rule — 'aggregation should be limited to transparent methods with a sound scientific basis agreed upon by the statistical community'[15].

[14] Paruolo, P., Saisana, A., Saltelli, A., forthcoming 2013, *Ratings and rankings: Voodoo or Science?* Journal Royal Statistical Society A, 176 (2); Saisana M., D'Hombres B., Saltelli A., 2011, *Rickety Numbers: Volatility of university rankings and policy implications*. Research Policy 40, 165–177.

[15] This entails that only data measured in the same units should be aggregated.

ANNEX 4
COMPOSITE INDICATORS — A TOOL FOR POLICY-MAKERS? A RESEARCH PERSPECTIVE

Composite indicators of increasing sophistication have entered the public debate in the last half-century. They aim to capture society's performance in complex fields, such as economy, environment or technological achievement — stock market indices being probably the most used composite indicators. The Consumer Price Index (CPI), for example, which considers the costs of a basket of various goods and services purchased monthly by a typical household, offers a more complete picture of the development of the cost of living in different countries than would the price of a single item (e.g., bread, fuel or McDonald's Big Mac, used by some analysts as a 'quick and dirty' measure of purchasing power).

The **OECD-JRC *Handbook on Composite Indicators*** (OECD/EC JRC, 2008)[16] offers a review and guidelines on constructing such aggregate measures. A recent compilation[17] of existing composite indicators lists almost 300 such measures from the fields of economy, society, environment, globalisation and technology[18].

Phenomena described by composite indicators are usually multi-dimensional and **complex**: think of concepts such as welfare, quality of education, or sustainability. The aim of a composite is to reduce complexity to a measurable form by replacing non-measurable phenomena with intermediate objectives whose achievement can be observed and measured. No matter how subjective and imprecise such an attempt maybe, it implies the recognition of the multidimensional nature of a phenomenon to be measured and the effort of specifying the single aspects and their interrelation. The reduction into parts has limits when crucial components of the system are not considered. On top of the existing requirement for **quality of statistical information**, there is one additional element that is essential for the use of composite indicators. This is the existence of a **community of peers** (be these individuals, regions, countries) willing to accept composite indicators as their common yardstick for identifying limitations and promoting good practices. In fact, acceptance of a composite indicator relies both on a strong scientific basis for its development and, maybe more important, on negotiation[19].

The development of a composite indicator is not straightforward, but it involves **theoretical and methodological assumptions** that need to be assessed carefully to avoid producing results of dubious analytic rigour[20]. Furthermore, the fact that a composite indicator is likely to be received by a polarised audience calls for stringent standards of rigour and robustness[21]. A case in point is the use of aggregate measures for university performance, which has been fiercely contested.

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16 OECD/EC JRC, 2008, *Handbook on Constructing Composite Indicators. Methodology and User Guide*, OECD Publishing, ISBN 978-92-64-04345-9. .

17 Bandura, R., and Saisana, M., 2012, *An inventory of 300 composite indicators*, European Commission, JRC-IPSC, Italy (No EUR 25560 EN).

18 http://composite-indicators.jrc.ec.europa.eu/Handbook.htmcomposite-indicators.jrc.ec.europa.eu .

19 Funtowicz, S. O., J. R. Ravetz, 1990, *Uncertainty and Quality in Science for Policy*. Dordrecht, NL: Kluwer Academic Publishers.

20 Saisana M., A. Saltelli, S. Tarantola, 2005, *Uncertainty and sensitivity analysis techniques as tools for the analysis and validation of composite indicators*, Journal of the Royal Statistical Society A 168(2), 307-323.

21 Saltelli A., 2007, *Composite indicators between analysis and advocacy*, Social Indicators Research 81, 65-77.

To maximise their utility and minimise their misuse, composite indicators need to be developed using reliable statistical sources, documented transparently, and validated using appropriate uncertainty and sensitivity analyses, in order to render them more defensible in the face of scientific or technical controversy.

ANNEX 5
COMPLETING THE PICTURE:
ADDITIONAL INDICATORS DEVELOPED BY THE EUROPEAN STATISTICAL SYSTEM

Below is a list of indicators now being implemented according to the recommendations[22] of the ESS' Sponsorship Group on Measuring Progress, Well-being and Sustainable Development. These were based on the SSFC recommendations[23] and the GDP and Beyond Roadmap and adopted by the European Statistical System Committee in 2011[24].

1. Strengthening the household perspective and distributional aspects of income, consumption and wealth

Household accounts + key indicators

A standard quarterly news release of household account should be published in a harmonised and synchronised way across the European Statistical System based on the following **list of key indicators:**

1. Individual consumption expenditure, in volume, per consumption unit;

2. Gross disposable income in real terms, per consumption unit;

3. Gross savings rate;

4. (Optional) breakdown of actual individual consumption into 'durable goods' (e.g. cars, home appliances), 'food and non-alcoholic beverages', 'housing, water, electricity, gas and other fuels', 'other non-durable goods' and 'social transfers in kind';

5. Breakdown of the adjusted gross disposable income into (1) labour income (wages and salaries); (2) income of the self-employed; (3) capital income (including from actual and imputed rents); (4) social benefits and transfers in kind (and other current transfers) and (5) taxes and social contributions (compulsory contributions).

For international comparisons, the focus should be on annual data on **household adjusted disposable income per consumption unit, in real terms using purchasing power parities (PPP)** as deflators.

Household material wealth

As of 2017, the annual indicators listed below should be available at t+12 months and used in the EU when communicating on household material wealth.

1. Household gross debt (loans) as a percentage of their gross disposable income;

[22] http://epp.eurostat.ec.europa.eu/portal/page/portal/pgp_ess/0_DOCS/estat/SpG_Final_report_Progress_wellbeing_and_sustainable_deve.pdf.

[23] Stiglitz-Sen-Fitoussi Commission — http://www.stiglitz-sen-fitoussi.fr/en/index.htm.

[24] As the ESS's work transposes both the five *GDP and beyond* actions and the 12 SSFC recommendations, not all indicators proposed in this Annex are relevant as complements to GDP, but serve specific policy needs, e.g. climate and energy.

2. Value of household assets in 'dwellings' and 'land' as a percentage of their gross disposable income; 3. Household wealth (net financial assets + assets in dwellings and land) as a percentage of their gross disposable income.

As from 2020, the indicators listed below should be available and updated at least every 10 years:

1. Time spent by households on different forms of non-market production of goods and services; 2. (Optional) Actual household consumption including value added from non-market domestic activities, in total and per consumption unit.

Distributional indicators (to be published from 2020)

1. Adjusted gross disposable income for different categories of household (e.g. according to standard of living, household composition and age structure); 2. Actual individual consumption for the different categories of household; 3. Gross savings rate for the different categories of household.

2. Multi-dimensional measures of quality of life

Below is a list of dimensions, topics and subtopics for which indicators are published on Eurostat's website[25]; the list and the set of indicators will be continuously updated and supplemented.

DIMENSION		Topic/subtopics
1) MATERIAL LIVING CONDITIONS	**1.1**	**Income**
	1.2	**Consumption**
	1.2.1	Constrained consumption
	1.2.2	Non-market consumption and government-provided services
	1.3	**Material conditions**
	1.3.1	Material deprivation
	1.3.2	Housing conditions
2) PRODUCTIVE OR MAIN	**2.1**	**Quantity of employment**

[25] http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/.

ACTIVITY	2.1.1	Unemployment
	2.1.2	Underemployment, quantity
	2.1.3	Underemployment, quality
	2.2	**Quality of employment**
	2.2.1	In-work poverty
	2.2.2	Health and safety at work
	2.2.3	Work/life balance
	2.2.4	Temporary work
	2.2.5	Perception of quality of employment
	2.3	**Other main activity**
3) HEALTH	**3.1**	**Outcomes**
	3.1.1	Life expectancy
	3.1.2	Morbidity and health status
	3.2	**Drivers: (un)healthy behaviours**
	3.3	**Access to healthcare**
4) EDUCATION	**4.1**	**Competences and skills**
	4.1.1	Educational attainment
	4.1.2	Self-reported skills
	4.1.3	Assessed skills PIAAC
	4.2	**Lifelong learning**
	4.3	**Opportunities for education**
5) LEISURE AND SOCIAL INTERACTIONS	**5.1**	**Leisure**
	5.1.1	Quantity of leisure
	5.1.2	Quality of leisure
	5.1.3	Access

	5.2	**Social interactions**
	5.2.1	Activities with people (including feelings of loneliness)
	5.2.2	Activities for people (volunteering and care)
	5.2.3	Supportive relationships
	5.2.4	Social cohesion (interpersonal trust, perceived tensions, inequalities)
6) ECONOMIC AND PHYSICAL SAFETY	**6.1**	**Economic security and vulnerability**
	6.1.1	Wealth (assets)
	6.1.2	Debt
	6.1.3	Income insecurity (including job)
	6.2	**Physical and personal security**
	6.2.1	Crime
	6.2.2	Perception of physical safety
7) GOVERNANCE AND BASIC RIGHTS	**7.1**	**Institutions and public services**
	7.1.1	Trust in and/or satisfaction with institutions
	7.1.2	Trust in and/or satisfaction with public services
	7.2	**Discrimination and equal opportunities**
	7.3	**Active citizenship**
8) NATURAL AND LIVING ENVIRONMENT	**8.1**	**Pollution (including noise)**
	8.2	**Access to green and recreational spaces**
	8.3	**Landscape and built environment**
9) OVERALL EXPERIENCE OF LIFE	**9.1**	**Life satisfaction**
	9.2	**Affects**
	9.3	**Meaning and purpose**

3. Environmental sustainability (preliminary list)

First-priority areas

By 2012:

1. Early estimates (now-casts) of CO_2 emissions from energy consumption

By 2013-14:

2. Energy consumption by economic activity (NACE breakdown)
3. Energy efficiency by economic activity
4. Energy productivity of the economic sectors
5. Carbon intensity by economic activity (NACE breakdown)
6. Carbon productivity by economic activity
7. Expenditure related to climate change adaptation
8. Emissions 'embedded' in imports
9. Emissions induced by final use of products, by product group
10. National or EU carbon footprint
11. Raw material consumption

Second-priority areas

By 2012-14:

1. 'Green' employment
2. Turnover generated by 'green' economy
3. National expenditure on environmental protection
4. Total investment and current expenditure by households, government and industry
5. Expenditure by environmental domain (air and climate, wastewater, waste, other)

In the longer term:

6. Depletion (change in stock levels) of natural resource assets, e.g. energy reserves

7. National saving net of total natural resource depletion

8. Expected life of a natural resource asset

9. Landscape state and biodiversity

10. Changes in land use

Third-priority areas

By 2013-14:

1. Water abstraction and use by river basin or region
2. Water use by economic activity (NACE breakdown)

In the longer term:

3. Waste generated by economic activities (NACE breakdown)
4. Waste recycled by economic activity
5. Recycling rate of waste by economic activity

Regional and sub-national data can help to reduce citizens' sense of distance from statistical information. Data per region is particularly important for large countries and for atypical regions such as the outermost regions or islands. Data per type of area or region is important for issues that change depending on the type of area. In addition, measuring such issues nationally does not allow for meaningful comparison between countries. For example, noise pollution tends to be higher in cities. A country may have a low share of people reporting noise pollution because the country is predominantly rural or because noise pollution in their cities is low. The same can be said of proximity to healthcare services, access to primary schools, public transport services, air pollution and crime.

Further technical details on Action 3: (see Section III.3.1)

The distribution of issues within a country can be captured from three main angles: regional, local and 'geo-spatial'. The relevance of these angles depends on the link to the policy-making level, the nature of the issue and the international comparability.

Since 2009, the Commission has improved the international comparability of regional typologies and increased the link to the policy-making level for the two revised local typologies.

The 'geo-spatial' angle is the most flexible and facilitates the measurement of issues using a functional geography, such as service areas of hospitals, schools or universities, river basins, travel-to-work areas and metropolitan areas. For example, geographic information systems (GIS) can identify areas with low access to services such as hospitals or schools, which a sample survey cannot identify.

The regional angle

The **regional angle** covers two approaches: per region and per type of region. For an example of data per NUTS[26] 2 region, see Figure 5 in Annex 2. If data is available for each region, both approaches can be used. Given that there are 1 294 NUTS 3 regions in the EU, many data points are not available at NUTS 3 level. Instead, NUTS 3 can be grouped into types, e.g. metro, border or rural regions[27].

Since 2009, the Commission has developed a number of harmonised regional typologies: urban, intermediate and rural, border, metro, coastal, mountain regions, island regions and sparsely populated regions[28]. These harmonised typologies improve international comparability and policy relevance.

The local angle

[26] Nomenclature of Units for Territorial Statistics.
[27] http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Regional_typologies_overview.
[28] http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Regional_typologies_overview.
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Coastal_region_statistics.

The **local angle** is based on local administrative units level 2 (LAU2). Due to the high number of LAU2s (over 130 000), the main approach here is an analysis by type of area. Two new classifications are used: the degree of urbanisation[29] (see below) classifies LAU2s into (1) cities, (2) towns and suburbs and (3) rural areas. The Urban Audit uses the same city definition, but adds commuting zones around each city (as defined by the OECD-EC methodology).

New degree of urbanisation

A new degree of urbanisation approved in 2011 has now been used in all the European surveys. The new methodology is based on a population grid which reduces the distortion caused by the variation in the size of local administrative units[30]. Eurostat has created a webpage dedicated to the indicators by degree of urbanisation used in different surveys.

The strength of this classification is that it successfully captures issues which are strongly influenced by the level of urbanisation and density. Issues relating to noise, crime and air pollution are much more prevalent in cities than in other types of areas. For an example of data by degree of urbanisation, see Figure 7 in Annex 2.

The revised urban audit

The Urban Audit cities and Larger Urban Zones have been revised and harmonised together with the OECD[31] and cover all cities with a centre of 50 000 inhabitants or more. The Urban Audit now covers the same cities as the degree of urbanisation.

This new methodology not only improves the international comparability, it is also explicitly linked to the decision-making level. Within clear statistical limits, the city can be defined so as to ensure a perfect match with its political boundaries. This means that the data collected by the Urban Audit are directly relevant for mayors and city managers.

Geo-spatial angle analysis

By combining different data sources, geo-spatial analysis can create a wide range of indicators which can be aggregated flexibly to the geography of choice (LAU2, NUTS, country, EU, etc.). It can be used to analyse many issues, including access to services, natural risks such as flooding and forest fires, mobility, access to green space, exposure to noise or pollutants.

Below is an illustrative list of actions which show the benefits of this approach.

INSPIRE

Within the EU, an infrastructure for geo-spatial information has been established by the INSPIRE[32] Directive. Intensive cooperation with NSIs and mapping agencies has started to ensure better coordination of Geographic Information Systems (GIS) and statistics.

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29 http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Revision_of_the_degree_of_urbanisation.

30 See 2013 Regional Working Paper: *A new degree of urbanisation* by Lewis Dijkstra and Hugo Poelman.

31 See *Redefining 'Urban': A new way to measure metropolitan areas*. OECD 2012 and 2012 Regional Focus: *A harmonised city definition* by Dijkstra and Poelman.

32 EP and Council Directive 2007/2/EC of 14.3.2007, OJ L 108 of 25.4.2007, p. 1.

Grid statistics (population)

The GEOSTAT project[33] has produced a prototype European population grid dataset for the reference year 2006 at 1 km² resolution[34]. The GEOSTAT 2006 dataset contains the total population of the EU and EFTA countries.

Eurostat will collect the boundaries of the smallest territorial units for which population is available for the census year 2011. Among other things, this will help improve population disaggregation grids.

The Commission services will launch a project to detect buildings at a very high resolution, which will allow for better population disaggregation in rural areas and identification of small and medium-sized towns.

Geocoding of primary schools

To capture problems relating to rural development, Eurostat has signed agreements with nine Member States whereby it will be given the location of access to the following public services: primary schools, secondary schools, universities, hospitals and elderly people's homes.

Collecting more points of interest (POI)

Eurostat acquires reference topographic information (administrative boundaries, transport network, hydrography, settlements) from EuroGeographics, the association of European mapping and cadastral agencies. The current contract with EuroGeographics covers the gradual inclusion of a number of POIs: hospitals and primary schools are mandatory POIs, secondary schools, universities, power plants, disposal sites and landfills, and emergency medical services are 'high importance' POIs, and 19 other kinds of POI are flagged as of medium or low importance.

The acquisition of POIs and their inclusion in the datasets has proven to be difficult. In some countries, no centralised registers exist and in most cases no direct geo-references are available and geographical locations have to be derived from the postal address or post code.

[33] Developed within the European Statistical System.

[34] http://epp.eurostat.ec.europa.eu/portal/page/portal/gisco_Geographical_information_maps/publications/geostat_population_grid_report.

COMPLETED PROJECTS

FP6

1) INDI-LINK — Indicator-based assessment of interlinkages between different sustainable development objectives
Cordis: http://cordis.europa.eu/projects/rcn/84091_en.html
Website: http://www.indi-link.net/
Duration: 36 months, 1.11.2006 – 31.10.2009

2) DECOIN — Development and Comparison of Sustainability Indicators
Cordis:
http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=DECOIN&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=84127
Website: http://www.decoin.eu/
Duration: 36 months, 1.11.2006 – 31.10.2009

3) EXIOPOL — A New Environmental Accounting Framework Using Externality Data and Input-Output Tools for Policy Analysis
Cordis:
http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=EXIOPOL&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=81289
Website: http://www.feem-project.net/exiopol/index.php
Duration: 56 months, 1.3.2007 – 31.10.2011

FP7

4) SMILE — Synergies in multi-scale inter-linkages of eco-social systems

Cordis:
http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=SMILE&FRM=1&STP=10&SIC=SICSOC&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=88426
Website: http://www.smile-fp7.eu/
Duration: 42 months, 1.1.2008 – 30.6.2011

5) IN-STREAM — The Integration of Mainstream Economic Indicators with Sustainable Development Objectives
Cordis: http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=IN-STREAM&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=88213
Website: http://www.in-stream.eu/
Duration: 36 months, 1.10.2008 – 30.9.2011

6) WIOD — World Input-Output Database: Construction and Applications
Cordis:
http://cordis.europa.eu/search/index.cfm?fuseaction=proj.document&PJ_RCN=10745239

Website: http://www.wiod.org/
Duration: 32 months, 1.5.2009 – 30.4.2012

7) OPEN: EU — One planet economy network Europe
Cordis: http://cordis.europa.eu/projects/rcn/91316_en.html
Website: http://www.oneplaneteconomynetwork.org/
Duration: 36 months, 1.9.2009 – 30.11.2011

8) TESS —Transactional Environmental Support System
Website: http://www.tess-project.eu/
Duration:

ONGOING PROJECTS

FP7

9) CREEA — Compiling and Refining Environmental and Economic Accounts
Cordis:
http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=CREEA&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=97380
Website: http://creea.eu/
Duration: 36 months, 1.4.2011 – 31.3.2014

10) BRAINPOOL — Binging Alternative Indicators into Policy
Cordis:
http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=Brainpool&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=100577
Website: http://www.brainpoolproject.eu/
Duration: 30 months, 1.10.2011 – 31.3.2014

11) APRAISE — Assessment of Policy Interrelationships and Impacts on Sustainability in Europe
Cordis:
http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=Apraise&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=100557
Website: http://www.apraise.org/
Duration: 36 months, 1.10.2011 – 30.9.2014

12) E-Frame — European Framework for Measuring Progress
Cordis: http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=E-FRAME&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=101409
Website: http://www.eframeproject.eu/
Duration: 30 months, 1.1.2012 – 30.6.2014

13) DESIRE — Development of a System of Indicators for a Resource efficient Europe
Cordis:
http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=DESIRE&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=104212
Website: http://www.desire-project.eu
Duration: 42 months, 1.9.2012 – 28.2.2016

14) CARBON CAP — Carbon emission mitigation by Consumption-based Accounting and Policy.
Duration: 39 months. The project is under negotiation and is expected to start at the autumn 2013.

15) Web-COSI — Increasing trust in collectively-generated statistics

16) DecarboNet — Raising collective awareness about environmental challenges
Website: http://www.decarbonet.eu/

17) EVERYAWARE — Citizen monitoring of climate
Cordis: http://cordis.europa.eu/fp7/ict/fet-open/portfolio-everyaware_en.html
Website: http://www.everyaware.eu/

18) EUNOIA — Cities from a sustainability point of view
Cordis:
http://cordis.europa.eu/search/index.cfm?fuseaction=proj.document&PJ_RCN=13183544
Website: http://eunioa-project.eu