

Open Working Group on Sustainable Development Goals (OWG)
Statistical note for the issue brief on:

Energy

(Draft of 21 November 2013, subject to change)

A. Main policy issues, potential goals and targets

1. Modern energy services are crucial to human well-being and to a country's economic development. Access to modern energy is essential for the provision of clean water, sanitation and healthcare and for the provision of reliable and efficient lighting, heating, cooking, transport, and telecommunication services. On the other hand, environmental and resource management considerations make it necessary to curb the use of energy from non-renewable sources through improving energy efficiency and increasing the share of non-renewable sources in the production and use of energy.

2. In declaring 2012 the "International Year of Sustainable Energy for All," the UN General Assembly established three global objectives to be accomplished by 2030: to ensure universal access to modern energy services, to double the global rate of improvement in global energy efficiency, and to double the share of renewable energy in the global energy mix. The emerging proposals for dedicated sustainable development goals and targets on energy tend to focus on these three main objectives.

3. The Sustainable Energy for All (SE4ALL) initiative's global tracking framework¹ will set 2010 as the starting point against which the progress of the initiative be measured. The framework provides an initial system for regular global reporting, based on indicators that are technically rigorous and at the same time feasible to compute from current global energy databases and that offer scope for progressive improvement over time.

B. Conceptual and methodological tools

4. The United Nations *International Recommendations for Energy Statistics*² provide data compilers with a complete set of recommendations covering all aspects of the statistical production process framework, from basic concepts, definitions and classifications to data sources, data compilation strategies, energy balances, data quality and statistical dissemination. Energy statistics deal with the collection and compilation of information on production, imports, exports and domestic use of energy products on the basis of specific surveys and by using for example business statistics, foreign trade statistics and administrative data. Energy balances reorganise the basic energy statistics by confronting and consolidating the supply and use sides, and by highlighting the transformation of energy within the economy.

¹ <http://www.sustainableenergyforall.org/tracking-progress>

² <http://unstats.un.org/unsd/statcom/doc11/BG-IRES.pdf>

5. The Standard International Energy Product Classification (SIEC) is a classification of products relevant for energy statistics which has been developed as part of the preparation of the International Recommendations for Energy Statistics (IRES).

6. The *System of Environmental-Economic Accounting for Energy* (SEEA-Energy)³ supports analyses of the role of energy within the economy and of the relationship between energy-related activities and the environment. Energy accounts can be seen as a reorganization and extension to energy statistics and energy balances with the goal of producing a systems-based energy information structure that uses definitions, principles and classifications that are consistent with the national accounts.

7. There is no single internationally accepted and adopted definition and measurement method of access to modern energy. The *World Energy Outlook (WEO)*⁴ defines modern energy access as “a household having reliable and affordable access to clean cooking facilities, a first connection to electricity and then an increasing level of electricity consumption over time to reach the regional average”. It can be a challenge to determine how best to capture issues such as the quantity, quality, and adequacy of service, as well as complementary issues such as informality and affordability.

C. Data availability, requirements, methodological challenges and limitations
(based on the findings of the SE4ALL Global Tracking Framework)

Challenges in defining and measuring energy access

8. Because currently available global databases only support binary global tracking of energy access, the SE4ALL Global Tracking Framework, based on an exhaustive analysis of existing global household survey questionnaires, suggested the following binary measures:

- Electricity access, defined as availability of an electricity connection at home or the use of electricity as the primary source for lighting;
- Access to modern cooking solutions, defined as relying primarily on non-solid fuels for cooking.

9. The SE4ALL Global Tracking team was able to construct a global database that covers 212 countries for access to modern energy services. A variety of data sources—primarily household surveys (including national censuses) and in a few cases, utility data—contribute to the measurement of access. Two global databases have been compiled: the World Bank’s Global Electrification Database and World Health Organization’s Global Household Energy Database. Both databases encompass three data points for each country—around 1990, around 2000, around 2010. Given that surveys were carried out infrequently, statistical models have been developed to estimate missing data points. Data on household fuel and electricity consumption have also been used from the United Nations Statistics Division (UNSD)

³ <http://unstats.un.org/unsd/envaccounting/seeae/>

⁴ <http://www.worldenergyoutlook.org/>

*Energy Balances and Electricity Profiles*⁵ and from the International Energy Agency (IEA) *Energy Balances of OECD Countries* and *Energy Balances of Non-OECD Countries*⁶.

10. While the binary approach serves the immediate needs of global tracking, there is a growing consensus that measurements of energy access should be able to reflect a continuum of improvement. A candidate multi-tier metric has been put forward for medium-term development under the SE4ALL initiative which addresses many of the limitations of the binary measures described above.

Challenges in defining and measuring energy efficiency

11. Energy efficiency is defined as the ratio between useful outputs and associated energy inputs. Increasing energy efficiency aims at reducing the amount of energy required to provide the same products and services. Decoupling of energy use and economic growth is seen as a necessity to ensure a sustainable development. The extent to which such decoupling takes place can be illustrated by comparing changes in GDP with changes in domestic use of energy.

12. Energy intensity (typically measured as energy consumed per dollar of gross domestic product, GDP) has traditionally been used as a proxy for energy efficiency. Energy intensity is an imperfect proxy for energy efficiency because it is affected not only by changes in the efficiency of underlying processes, but also by other factors such as changes in the volume and sectoral structure of GDP. These concerns can be partially addressed by statistical decomposition methods that allow confounding effects to be stripped out. Complementing national energy intensity indicators with sectoral ones also helps to provide a more nuanced picture of the energy efficiency situation.

13. The SE4ALL Global Tracking team was able to construct a global energy database for the period 1990–2010 compiled from energy balances for 181 countries published by the International Energy Agency and the United Nations. These are complemented by data on national and sectoral value-added from the World Bank's *World Development Indicators*⁷. Global final energy consumption can be broadly divided among the following major economic sectors: agriculture, industry, residential, transport, and services.

14. Looking ahead, significant international efforts are needed to improve the availability of energy input and output metrics across the main sectors of the economy to allow for more meaningful measures of energy efficiency.

Challenges in defining and measuring the share of renewables in the energy mix

15. While there is a broad consensus among international organizations and government agencies on what constitutes renewable energy, their legal and formal

⁵ <http://unstats.un.org/unsd/energy/balance/>

⁶ http://www.oecd-ilibrary.org/energy/energy-balances-of-oecd-countries_19962835-en and http://www.oecd-ilibrary.org/energy/energy-balances-of-non-oecd-countries_19962843-en

⁷ <http://data.worldbank.org/data-catalog/world-development-indicators>

definitions vary slightly in the type of resources included and the sustainability considerations taken into account.

16. Most common indicators used are: the share of renewable energy in total primary energy production; the share of renewable energy in final energy consumption; and the share of electricity produced from renewable energy sources in electricity consumption.

17. For the purposes of global tracking, data for the period 1990–2010 have been compiled from energy balances for 181 countries published by the International Energy Agency and the United Nations. Those data will be complemented by indicators from available sources on: (i) policy targets for renewable energy and adoption of relevant policy measures; (ii) technology costs renewable energy technologies; and (iii) total investment in renewable energy.

18. Looking ahead, significant international efforts are needed to improve data collection methodologies and bridge identified data gaps. In particular, there is a need to develop internationally agreed-upon standards for sustainability for each of the main technologies, which can then be used to assess the degree to which deployment meets the highest sustainability standards. This is particularly critical in the case of biomass, where traditional harvesting practices can be associated with deforestation.

D. Conclusions

19. Although the internationally agreed recommendations for the compilation of national energy statistics have been established and are used in many countries, there are still large differences in the degree of application, coverage and quality of the data collected worldwide. In addition, indicators that require disaggregated data by gender, geography, income, industry and other categories are not always available. Ongoing concerted capacity development efforts should be scaled up to improve the statistical production process of countries that are not able to provide the required data.

20. While the methodology of the SE4ALL Global Tracking Framework provides an adequate basis for basic global tracking, the framework could be vastly improved. To effectively monitor progress, incremental investments in energy data systems will be essential, both at the global and national levels.