

G-1: Final energy consumption

- 1) General description 1**
 - 1.1) Brief definition..... 2*
 - 1.2) Units of measurement 2*
 - 1.3) Context.....2*

- 2) Relevance for environmental policy..... 2**
 - 2.1) Purpose 2*
 - 2.2) Issue 2*
 - 2.3) International agreements and targets..... 3*
 - a) Global level 3*
 - b) Regional level 3*
 - c) Subregional level 3*

- 3) Methodology and guidelines..... 4**
 - 3.1) Data collection and calculations 4*
 - 3.2) Internationally agreed methodologies and standards 4*

- 4) Data sources and reporting..... 5**

- 5) References at the international level..... 5**

1) General description

1.1) *Brief definition*

This indicator shows final energy consumption, represented by energy supplied to the final consumer for all energy uses – both as total and broken down by major users (industry, transport, households, services, and agriculture) in accordance with the International Standard Industrial Classification of All Economic Activities (ISIC).

1.2) *Units of measurement*

Thousand tons of oil equivalent (ktoe) for the total consumption and for consumption by major consumers; percentage for the shares of particular consumers in final consumption.

1.3) *Context*

Relation to other indicators from the Guidelines - This indicator relates to indicators “G-2: Total primary energy supply” and “G-3: Energy intensity”.

2) Relevance for environmental policy

2.1) *Purpose*

This indicator represents a driving forces indicator and shows trends in final energy consumption. The trend in final energy consumption (total and broken down by users) provides a broad indication of progress in reducing energy consumption and associated environmental impacts by the different end users (industry, transport, households, services, and agriculture). It can be used to help monitor and assess the success of key policies that attempt to influence energy consumption and energy efficiency.

2.2) *Issue*

Energy is a key factor in industrial development and the provision of essential services. Traditionally, energy has been considered a key element of economic progress. However, current energy consumption practices have considerable negative impacts on the

environment. Energy-related problems raise concern due to their impact on the quality of the environment through the pollution of air, water bodies and soil. Hence better integration of environmental and energy-efficiency issues into environmental, economic and social policies is an important task for countries. The policy objective is to work out and implement particular measures in certain sectors of the economy to increase the efficiency of energy consumption (or to reduce energy intensity), and thereby to reduce negative environmental impacts. Thus, for instance, sector-related strategies should include rational, achievable and reasonable efficiency standards and also financial incentives. Activities in the household sector focus mainly on the application of energy efficiency standards to construction of new housing, energy pricing reforms and public awareness campaigns.

2.3) International agreements and targets

a) Global level

The United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol call for curbing total greenhouse gas (GHG) emissions, the major share of which is CO₂ emissions caused by combustion of fossil fuels. The Kyoto Protocol establishes limits and targets for total GHG emissions for industrially developed countries and economies in transition (Annex 1 parties).

b) Regional level

The ECE Convention on Long-range Transboundary Air Pollution requires the implementation of concrete measures to reduce emissions of pollutants into the air, including those originating in fuel combustion.

c) Subregional level

The Environment Strategy of countries of South-Eastern and Eastern Europe, Caucasus and Central Asia calls, in particular, for the development and dissemination of alternative energy technologies to increase the share of renewable energies in the energy mix, for improving energy efficiency and for greater reliance on advanced energy technologies, including cleaner fossil fuel technologies. The European Union (EU) Directive on energy end-use efficiency and energy services (2006/32/EC) aims at boosting the cost-effective and efficient use of energy in the EU. According to this Directive, each Member State should have each year saved 1% more energy than in the previous year through increased energy efficiency, which was to lead to annual energy savings of around 6% by 2012. Directive 2010/31/EU promotes the improvement of the energy performance of buildings, taking into account outdoor climatic and local conditions, as well as indoor climate requirements and cost-effectiveness on the energy performance of buildings. In 2010, Energy 2020: A Strategy for competitive, sustainable and secure energy has been adopted which requires that 20 % energy savings will be achieved at the EU level by 2020; the Strategy was followed by the Energy Efficiency Plan 2011 and Energy Roadmap 2050.

3) Methodology and guidelines

3.1) Data collection and calculations

Final energy consumption is calculated as the sum of final energy consumption from different economic sectors and households. Final energy consumption includes the consumption of transformed energy (electric power, public heating, petroleum products, coke, etc.) and primary fuels such as natural gas and renewable energy sources (solar energy, biomass, etc.). Final energy consumption in *industry* includes consumption in all industrial sectors except the “energy sector”. Final energy consumption in *transport* includes consumption in all types of transportation (rail, road, public transport in cities, pipeline and air transport and inland and maritime navigation). Final energy consumption in *households* includes quantities consumed by households, excluding the consumption of motor fuels for personal transport. Household consumption includes all use of electricity and use of fuels for space and water heating. Final energy consumption in *commercial and public services* includes consumption by public administration and private services. Final energy consumption in *agriculture* consists of quantities consumed by agriculture, including engines used for agricultural transportation. Final energy consumption in *fisheries* consists of quantities consumed by the fishing industry, excluding fishing on the high seas. *Non-energy use* covers those fuels that are used as raw materials in the different sectors and are not consumed as a fuel or transformed into another fuel. The relative contribution of a specific sector can be measured by the ratio of final energy consumption from that specific sector to the total final energy consumption calculated for a calendar year.

3.2) Internationally agreed methodologies and standards

The International Recommendations for Energy Statistics (IRES), adopted by the United Nations Statistics Division (UNSD) in 2011 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. An Energy Statistics Manual was published by the International Energy Agency (IEA) in 2005. Many other international organizations and agencies collect data on energy consumption using developed methodologies and standards: the Organization for Economic Co-operation and Development (OECD), the European Union Statistical Office (Eurostat), the European Environment Agency (EEA) and the World Bank (see references).

4) Data sources and reporting

In the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia, national energy balances are prepared by the government bodies responsible for economic affairs or in state statistical offices. Data on energy consumption in total and by sector are published in national energy balances and in statistical yearbooks. UNSD updates and maintains an Energy Statistics Database, based on reports by various countries, including countries of South-Eastern and Eastern Europe, Caucasus and Central Asia. The most comprehensive database on energy balances is maintained by IEA and includes national data as well as data and estimates collected by other international bodies.

5) References at the international level

- United Nations Framework Convention on Climate Change: <http://unfccc.int/2860.php>;
- ECE Convention on Long-range Transboundary Air Pollution: <http://www.unece.org/env/lrtap/welcome.html>;
- International Recommendations for Energy Statistics (IRES): <http://unstats.un.org/unsd/energy/ires/default.htm>;
- United Nations, *Energy Statistics –Definitions, Units of Measure and Conversion Factors*. Series F, No. 44;
- World Bank, *World Development Indicators* (issued annually): <http://databank.worldbank.org/data/views/variableselection/selectvariables.aspx?source=world-development-indicators>;
- OECD/IEA, *Energy Statistics of OECD Countries and Energy Statistics of Non-OECD Countries* (issued annually) Part I: Methodology: http://www.oecd-ilibrary.org/energy/energy-statistics-of-non-oecd-countries_19962851-en ;
- IAEA, UNDESA, IEA, Eurostat and EEA. *Energy Indicators for Sustainable Development: Guidelines and Methodologies*. (IAEA, 2005);
- IEA Energy Statistics Manual (2005): <http://www.iea.org/publications/freepublications/publication/name,3961,en.html>;
- IEA, *Key World Energy Statistics* (2012): <http://www.iea.org/publications/freepublications/publication/name,31287,en.html>;
- OECD Factbook 2013: Energy: http://www.oecd-ilibrary.org/economics/oecd-factbook_18147364;
- Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC;
- Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings;
- Energy 2020: A Strategy for competitive, sustainable and secure energy [COM(2010) 639 final];
- Energy Efficiency Plan 2011/* COM/2011/0109 final;

- Energy Roadmap 2050 /* COM/2011/0885 final;
- European Commission – Energy policy:
http://europa.eu/legislation_summaries/energy/european_energy_policy/index_en.htm
;
- UNSD Energy Statistics: <http://unstats.un.org/unsd/energy/default.htm> ;
- World Bank: <http://www.worldbank.org>;
- OECD I-library - Statistics: <http://www.oecd-ilibrary.org/statistics;jsessionid=1r7pxni2v4lc9.x-oecd-live-01>;
- EEA – Energy: <http://www.eea.europa.eu/themes/energy>;
- Eurostat - Energy:
<http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/introduction>;
- International Energy Agency: <http://www.iea.org>.