Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Target 7.3: By 2030, double the global rate of improvement in energy efficiency

Indicator 7.3.1: Energy intensity measured in terms of primary energy and GDP

Institutional information

Organization(s):

International Energy Agency (IEA)

United Nations Statistics Division (UNSD)

Concepts and definitions

Definition:

Energy intensity is defined as the energy supplied to the economy per unit value of economic output.

Concepts:

Total energy supply, as defined by the International Recommendations for Energy Statistics (IRES), as made up of production plus net imports minus international marine and aviation bunkers plus-stock changes. Gross Domestic Product (GDP) is the measure of economic output. For international comparison purposes, GDP is measured in constant terms at purchasing power parity

Rationale:

Energy intensity is an indication of how much energy is used to produce one unit of economic output. It is a proxy of the efficiency with which an economy is able to use energy to produce economic output. A lower ratio indicates that less energy is used to produce one unit of output.

Comments and limitations:

Energy intensity is only an imperfect proxy for energy efficiency. It can be affected by a number of factors, such as climate, structure of the economy, nature of economic activities etc. that are not necessarily linked to pure efficiency.

Methodology

Computation method:

This indicator is based on the development of comprehensive energy statistics across supply and demand for all energy sources – statistics used to produce a national energy balance.

Internationally agreed methodologies for energy statistics are described in the "International Recommendations for Energy Statistics" (IRES), adopted by the UN Statistical Commission, available at: https://unstats.un.org/unsd/energy/ires/.

Once a national energy balance is developed, the indicator can be obtained by dividing total energy supply over GDP.

Regional aggregates:

Aggregates are calculated, whether by region or global, by summing both total energy supply and gross domestic products over relevant countries.

Data sources

Total energy supply is typically calculated in the making of national energy balances. Energy balances are compiled based on data collected for around 150 economies from the International Energy Agency (IEA) and for all countries in the world from the United Nations Statistics Division (UNSD).

GDP data are taken mainly from the World Bank – World Development Indicator database.

Data availability

Description:

IEA and UN energy balances combined provide total energy supply data for all countries on an annual basis. GDP data are available for most countries on an annual basis.

Time series:

1990-present

Disaggregation:

Disaggregation of energy intensity, e.g. by final consumption sectors or end-uses, could provide further insights into progress towards energy efficiency. At present it is only feasible to calculate such sector disaggregations for the following sectors – industry, residential, transport, agriculture, households – as reported in the *Tracking SDG7: The Energy Progress Report* (formerly *Sustainable Energy for All Global Tracking Framework*). It would be desirable, over time, to develop more refined sectoral level energy intensity indicators that make it possible to look at energy intensity by industry (e.g. cement, steel) or by type of vehicle (e.g. cars, trucks), for example. Doing so will not be possible without statistical collaboration with the relevant energy consuming sectors.

Decomposition analysis of energy intensity trends seeks to filter out factors that affect energy demand, such as economy wide scale and structure shifts, from more narrowly defined energy intensity shifts. The methodology applies decomposition analysis to isolate a more refined measure of energy

intensity, one that sifts out the temporal shift of relative sector weights. This analysis is also reported in the *Tracking SDG7: The Energy Progress Report*.

Calendar

Data collection:

Data are collected on an annual basis.

Data release:

The IEA Energy Balances are published in summer (publishing information for two calendar years prior). The UN energy balances are made available towards the end of the calendar year (publishing information for two calendar years prior)

Data providers

National administrations, as described in documentation on sources for IEA and UNSD:

http://wds.iea.org/wds/pdf/WORLDBAL_Documentation.pdf

https://unstats.un.org/unsd/energy/edbase.htm

Data compilers

The International Energy Agency (IEA) and the United Nations Statistics Division (UNSD)

Description:

The IEA and UNSD are the primary compilers of national energy statistics and develop internationally comparable energy balances based on internationally agreed methodologies. Aggregates are based on a merging between IEA and UNSD data.

References

URL:

http://iea.org

http://unstats.un.org/unsd/energy

References:

IEA Energy Balances and Statistics

http://www.iea.org/statistics/

UN Energy Statistics Database http://unstats.un.org/unsd/energy/edbase.htm (description) and http://data.un.org/Explorer.aspx?d=EDATA (data)

IEA SDG 7 webpage: http://www.iea.org/sdg

International Recommendations on Energy Statistics (IRES) https://unstats.un.org/unsd/energy/ires/

International Energy Agency (IEA), International Renewable Energy Agency (IRENA), United Nations Statistics Division (UNSD), the World Bank, World Health Organization (WHO). 2018. “Tracking SDG7: The Energy Progress Report 2018”. https://trackingsdg7.esmap.org/

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