

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

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### Organization(s):

International Energy Agency (IEA)  
United Nations Statistics Division (UNSD)  
United Nations' Inter-agency Mechanism on Energy (UN Energy)

## Concepts and definitions

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### Definition:

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

### 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.

### 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

### 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

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### 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.

**Disaggregation:**

Disaggregation of energy intensity, e.g. by sector, 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 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 Global Tracking Framework.

**Regional aggregates:**

Aggregates are calculated, whether by region or global, using total energy supply as weights.

## Data Sources

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Total energy supply is typically calculated in the making of national energy balances. Energy balances are available for around 150 economies from the International Energy Agency (IEA) and for all non-OECD countries in the world from the United Nations Statistics Division (UNSD).

## Data Availability

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**Description:**

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

**Time series:**

1990-present

## Calendar

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**Data collection:**

Data is collected on an annual basis.

**Data release:**

The IEA Energy Balances are updated early Fall (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

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National statistical offices

## Data compilers

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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 are develop internationally comparable energy balances based on internationally agreed methodologies. Aggregates are based on World Bank analysis of IEA and UNSD data.

## References

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**URL:**

[iea.org](http://iea.org); [unstats.un.org](http://unstats.un.org)

**References:**

IEA Energy Balances and Statistics

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

UN Energy Statistics Database <http://unstats.un.org/unsd/energy/edbase.htm>

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) and the World Bank. 2017. "Global Tracking Framework 2017—Progress toward Sustainable Energy". World Bank, Washington, DC. License: Creative Commons Attribution CC BY 3.0 IGO

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