

Methodology

Explore energy efficiency progress for all regions and countries

The IEA Energy Efficiency Progress Tracker allows users to view the current rate of progress on energy efficiency at global and regional levels, containing the very latest energy demand and efficiency estimates.

COP28 saw a historic agreement reached with paragraph 28a of the [First Global Stocktake](#), calling for “doubling the global average annual rate of energy efficiency improvements by 2030”. The Tracker provides a view on how the world is progressing towards meeting this pledge and can inform countries developing efficiency strategies in a manner appropriate to their own national and regional circumstances.

While the Tracker does not attempt to provide a comprehensive view of all relevant data it provides a strong starting point for developing national strategies. Regional groupings of individual countries are consistent with the classifications outlined in the [IEA Global Energy and Climate \(GEC\) Model documentation](#). The Tracker covers most countries, except where the availability and reliability of data require further development. Further data and policy support is available by contacting energy.efficiency@iea.org.

The most comprehensive measure of energy efficiency is the energy intensity of the world economy, which encompasses the ratio of energy input to economic activity. Primary energy intensity is the main indicator used by the United Nations (UN) [Sustainable Development Goals](#) to track energy efficiency. It comprises the amount of total energy supply (TES) used to produce a given amount of Gross Domestic Product (GDP) measured in constant purchasing power parity (PPP) terms. Energy intensity progress – illustrated as positive values in this Tracker – is the annual reduction in energy intensity of the economy.

The Tracker brings together data from the IEA’s Energy Data Centre (EDC), the fuel market reports of the IEA’s Energy Markets and Security Directorate (EMS), and the [World Energy Outlook](#) (WEO). The Tracker uses IEA [World Energy Balances](#) (WEB) for its baseline historical data, to support consistency with the [Tracking Sustainable Energy Goals](#) (SDG7) Energy Progress Report. Growth rates are then applied to WEB data using the latest EMS and WEO estimates. Current year estimates are preliminary.

The WEO Net Zero Emissions by 2050 Scenario (NZE) scenario portrays a pathway for the global energy sector to achieve net zero CO₂ emissions by 2050, which is consistent with limiting long-term global warming to 1.5°C with limited overshoot (with a 50% probability). The NZE Scenario also meets the key energy-related UN Sustainable Development Goals, in particular achieving universal access to modern energy services by 2030 and securing major improvements in air quality.

While primary energy intensity is the main metric for tracking efficiency progress, energy intensity can also be measured based on Total Final Consumption (TFC), which represents the energy consumed in all end-use sectors – including transport, industry, and buildings. Energy consumption from coke ovens and blast furnaces used in steel manufacturing are included in TFC but losses from energy conversion, distribution, and transmission are not. These conversion losses are included in TES, and are the main reason why TES is higher than TFC.

Exchange rates measured in USD PPP terms are most commonly used for international comparisons. This is the approach adopted in this Tracker, although market exchange rates or natural currency units are also used by other sources. The reference year used for total economy USD GDP PPP in this Tracker is 2021. Different reference years can be used by other sources and can be subject to regular updates. Such factors can result in differences in intensity levels and rates of progress when comparing across different publications and sources.

At the most granular, energy efficiency is a measure of energy performance for a specific end use or process, such as heating, cooling, transport or manufacturing a product. Energy efficiency improves when less energy is required to meet the same needs or achieve similar output. Such, more granular data, can be explored in the IEA's [Energy End Uses and Efficiency Data Explorer](#).

Industry module

The IEA Energy Efficiency Progress Tracker industry module provides an overview of industrial energy intensity progress, energy demand and electrification trends at the global, regional and country levels. It aims to support understanding of national baselines in the context of the latest data of regional and global trends.

Two key indicators of industrial efficiency progress are assessed in detail – industrial energy intensity progress. Industrial energy intensity progress is calculated by dividing total final industrial energy consumption by total industrial value added. Changes in energy intensity are represented in all figures as annual improvement, and therefore, energy intensity progress (a fall in intensity) is represented as positive values.

The Industrial module uses World Energy Balances (WEB) for its baseline historical data. The most recent years and scenarios are derived by scaling up WEB values with the rates of change from the 2024 IEA World Energy Outlook (WEO) estimates. Industry value-added (IVA) data is compiled by adding National Accounts IVA data from the [UNIDO Data Browser](#) with construction value added data from the [UNdata portal](#) both in USD, 2015 terms.

Two WEO scenarios from the 2024 World Energy Outlook, none of which are forecasts, are illustrated to provide a framework for exploring different energy futures. These

scenarios are not designed to predict the most likely pathway —but rather to examine a range of potential futures.

The Stated Policies Scenario (STEPS) provides a sense of the prevailing direction of travel for the energy sector based on a detailed reading of the latest policy settings in countries around the world. It accounts for energy, climate, and related industrial policies that are in place or that have been announced. The aims of these policies are not automatically assumed to be met; they are incorporated in the scenario only to the extent that they are underpinned by adequate provisions for their implementation.

The Net Zero Emissions by 2050 Scenario (NZE) portrays a pathway for the global energy sector to achieve net zero CO₂ emissions by 2050, which is consistent with limiting long-term global warming to 1.5°C with limited overshoot (with a 50% probability). The NZE Scenario also meets the key energy-related UN Sustainable Development Goals, in particular achieving universal access to modern energy services by 2030 and securing major improvements in air quality.

Industrial energy demand is characterised by both heavy and light industries. Energy-intensive (heavy) industries comprise the production of metals; chemicals and petrochemicals; non-metallic minerals; and the paper, pulp, and printing sectors. Less energy-intensive (light) industries include food and beverages, textiles, wood products, machinery, transport equipment (including cars) and other non-manufacturing industries including mining and construction. Energy consumption from coke ovens and blast furnaces used in steel manufacturing are included in total final industrial energy consumption. For the purposes of this analysis non-energy uses such as material feedstocks for petrochemicals (e.g. for plastics manufacturing) are excluded.