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Energy Efficiency 2026

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Abstract

Energy Efficiency 2026 is the IEA's primary annual analysis of global energy efficiency developments, examining recent trends in energy intensity, energy demand, investment, employment and policy. This year's report explores how the global energy crisis is shaping energy demand and the role of energy efficiency measures, alongside sector-specific analysis across industry, buildings, appliances, transport and power systems. It also examines regional trends, highlighting differences in energy efficiency progress, policy approaches and responses to the crisis across the world. The report is launched in parallel with an update to the IEA Energy Efficiency Progress Tracker, which can be accessed through the IEA website.

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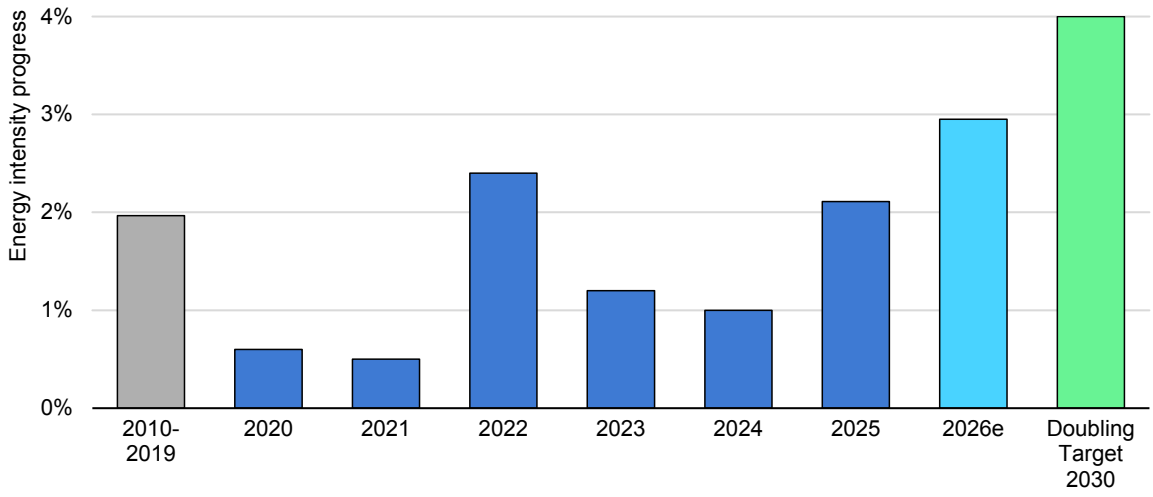
Executive summary

The energy crisis is reshaping global energy efficiency trends

Global primary energy intensity is expected to improve by nearly 3%, up from about 2% in 2025. This year's acceleration reflects energy demand growth flattening amid the global energy crisis triggered by the closure of the Strait of Hormuz, as supply constraints and higher energy prices weigh on consumption. Gross domestic product (GDP) growth has remained resilient at about 3%, buoyed up by investment in artificial intelligence and high-tech manufacturing.

The 2026 energy intensity reflects both the disruptions of the crisis and underlying progress on energy efficiency. While some gains related to longer-term efficiency measures continued, particularly through the adoption of more efficient and electrified technologies, part of this year's energy intensity change results from forced cuts in energy consumption. Households had to adapt their cooking and transport habits, while many businesses scaled back production, shifted to less energy-intensive activities or scrambled to find alternative energy sources. Some of these changes moderated energy demand growth but came at a significant economic and social cost.

Primary energy intensity progress, 2010-2019, 2020-2026e and doubling target



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Notes: Primary energy intensity = total energy supply divided by gross domestic product (using GDP 2021 purchasing power parity). An improvement is defined as a reduction in energy intensity. 2026e = estimated values for 2026.
Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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Governments have prioritised emergency responses, but structural policies will determine longer-term progress

Governments responded rapidly to the crisis, with around 120 countries introducing measures to save energy, protect consumers or strengthen long-term energy security. According to the IEA *Energy Crisis Policy Response Tracker*, over 60 governments introduced energy conservation measures such as public awareness campaigns, remote work, or reduced government travel. While these acted as important consumer protection measures, many were temporary and likely to have had only a modest impact on overall demand. In addition, around 100 governments provided some form of price support, including price caps, tax cuts and fuel subsidies. Just over 30 governments, including the European Commission, introduced longer-term measures to improve energy efficiency or accelerate electrification.

Among the more than 30 governments that introduced longer-term policies, a clear focus on efficient electrification emerged. Nearly 80% of governments introducing longer-term policies included measures to accelerate the efficient electrification of end uses, particularly through support for electric vehicles and heat pumps. Such measures are key to tackling affordability challenges. For example, combining heat pumps with better-insulated buildings could reduce household heating bills by up to 90%.

Across regions, government spending was generally focused on immediate consumer relief, with a smaller share directed towards measures that can reduce long-term fossil fuel dependence. While short-term measures to save energy or protect consumers provided relief for many during the crisis, support was predominantly untargeted, with just over one-third of governments introducing consumer support measures specifically targeted at vulnerable households and businesses.

Global energy demand growth stalls, as oil and gas demand are set to fall

Global energy demand is expected to be flat this year, with growth in renewables and coal offset by declines in oil and gas demand. Oil demand is expected to decrease in most regions, as supply disruptions, higher fuel prices, and changes in industrial activity weighed on demand for oil products. Gas demand is set to drop by 1.6%, driven largely by disruptions in the Middle East, lower gas-fired power generation in Europe amid higher renewables output, and a partial switch from gas to coal in Asia.

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Industrial energy demand growth, a recent drag in global efficiency progress, is set to slow down this year. Since 2019, the industrial sector has been the largest contributor to growth in energy consumption, as annual energy intensity progress in the sector averaged less than 0.5%. In 2026, some energy-intensive sectors, such as gas-intensive industries in the Middle East, and petrochemicals across several regions, have been affected disproportionally by the crisis. This can result in lower sectoral intensity, as less energy-intensive industries represent a higher share of this year's added value. However, this reflects crisis-driven changes rather than specific energy efficiency gains.

Transport and buildings efficiency is improving faster so far this decade, partly driven by higher prices on fossil fuels. In the buildings sector, intensity decreased after the 2022 crisis following the full-scale Russian invasion of Ukraine, but progress slowed again in the following years. The resulting spike in gas prices also saw many households struggling to afford residential energy bills. This year's crisis has heightened affordability concerns again, particularly for those using oil products for cooking, transport and heating. Efficiency is already helping to address those concerns, with improvements achieved since 2000 amounting to savings of over 20% of energy expenditure for low-income households.

At COP31, many countries supported a collective goal to improve buildings energy intensity by at least 25% by 2035. IEA analysis shows that this could be achieved through wider deployment of technologies and policy measures available today. Progress in this sector would help bring down energy bills and reduce emissions. It would also mark an important contribution to accelerate global efficiency progress, which sits at around 1.5% per year so far this decade, far short of the global target of 4% agreed by nearly 200 governments at COP28 in Dubai.

In the transport sector, electrification is set to continue supporting efficiency gains. Faster efficiency gains in transport are largely driven by the electrification of passenger cars. In China, electricity demand for EV charging increased over 50% so far this year, lowering demand for gasoline. In the European Union, between January and September, battery electric vehicles sales grew 50%, while sales of diesel and gasoline vehicles continued a structural decline, falling nearly 20% compared to the same period in 2025.

Trends in electricity demand also influenced this year's intensity changes

Electricity demand growth is set to outpace overall energy demand again in 2026, driven by electrification and AI-related demand. Electricity demand is set to grow about 3.6% this year. In China, which represents about half the global

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growth, EV charging, advanced manufacturing and data centres contributed to most of the increase in electricity demand, as cooler summer temperatures eased pressure on cooling demand. In countries affected by liquefied petroleum gas (LPG) and natural gas supply constraints, sales of electric cookers recorded significant growth: in March alone, India saw a more than 30-fold rise in daily sales of electric cookstoves on e-commerce platforms.

At COP31, electrification emerged as a key area of focus. The COP31 Presidency put a spotlight on electrification, building a coalition to advance the goal of a 35% electricity share in total final energy consumption by 2035. Discussions were underpinned by IEA analysis showing that it is cost effective to raise electrification levels to around 33% of total final energy consumption, from around 23%, with today's technology costs. Increased electrification efforts will contribute to a faster progress in energy efficiency. Electric vehicles are around three times more efficient than internal combustion ones, and heat pumps are three to five times more efficient than fossil-fuelled boilers, which can help moderate energy demand growth.

Divergent trends reflect the impact of the crisis in most exposed regions

The Asia Pacific region is set to see the largest changes in energy intensity in 2026, being the most exposed to disruptions in energy imports from the Middle East. China (3.6%), India (4.1%) and countries in Southeast Asia (2.8%) are set to see the largest changes in energy intensity this year, in contrast to recent trends. Lower energy use reflects both efficiency gains through electrification and more efficient equipment, and behavioural changes related to the impact of the crisis on businesses and households. For instance, cooking gas shortages forced families to change cooking habits and fuels, in many cases exposing them to dangerous air pollution. Some countries in the region introduced 4-day-workweeks or rationed supply of gas, affecting the activity in the industrial sector.

Efficiency progress in regions with lower exposure to the crisis was aligned with recent trends. In the North America (2%) and Latin America (0.7%), energy intensity progress stayed at levels close to the average seen so far this decade, as oil demand remained relatively flat in the region, contrasting global trends.

The crisis could mark a turning point for energy efficiency, if governments seize the opportunity

Responses to previous crises have shown that lasting changes in the energy sector can be achieved when governments introduce policies that focus on the long term. Following the oil shocks of the 1970s, many governments expanded alternative energy sources to oil and introduced structural

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policies that continued improving efficiency long after energy markets stabilised. For instance, new cars being sold in the United States used 40% less energy within a decade of these crises, and refrigerators sold in Japan are four times more efficient today than in the 1970s. In that period, global energy intensity has fallen by 50%, while GDP increased fivefold.

Lessons from past crises can help make 2026 a turning point for energy efficiency. Based on previous crises responses, the IEA has identified three key actions to ensure sustained efficiency progress. First, implementing ambitious policies and regularly updating requirements to ensure that efficiency continues improving over time. Second, providing sustained investment and clear, consistent policy signals that build investor confidence, rather than short bursts of crisis support. Third, making efficiency a whole-of-economy priority can support economic growth and improve living standards following a crisis. The energy challenges of 2026 serve to reinforce the positive case for stronger action on energy efficiency, and governments have all the tools available to them.

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Chapter 1. Global trends

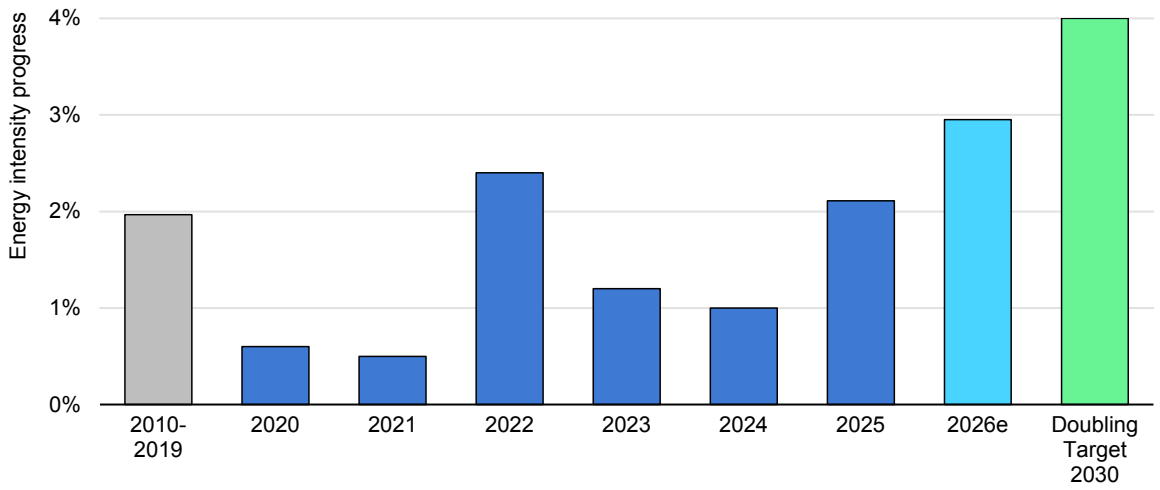
1.1 Key indicators

The energy crisis is reshaping global energy efficiency trends

Primary energy intensity, the amount of primary energy required to produce one unit of economic output, is used to track energy efficiency progress. When energy use grows more slowly than the gross domestic product (GDP), global energy intensity declines, indicating an improvement. In 2026, global primary energy intensity is expected to improve by nearly 3%, up from about 2% in 2025. This reflects the flattening of global energy demand growth amid the global energy crisis triggered by the closure of the Strait of Hormuz. Despite the disruption, the global economy has remained resilient, with expected annual GDP growth at about 3%, driven by strong activity in high-tech sectors.

In 2023, at COP28 in Dubai, nearly 200 governments agreed to collectively double the global average annual rate of energy efficiency progress by 2030. However, primary energy intensity progress has averaged around 1.5% per year so far this decade, which is well below the 4% needed to meet the COP28 goal.

Primary energy intensity progress, 2010-2019, 2020-2026e and doubling target



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Notes: Primary energy intensity = total energy supply divided by gross domestic product (using GDP 2021 purchasing power parity). An improvement is defined as a reduction in energy intensity. 2026e = estimated values for 2026.
Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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What factors affect annual primary energy intensity progress?

Many underlying factors can influence annual variations in primary energy intensity, masking or magnifying long-term efficiency gains. These include:

- **Use of more efficient technologies:** Improvements in the efficiency of appliances, vehicles, building envelopes, and industrial equipment and processes reduce the energy needed to provide the same level of services, delivering efficiency gains every year.
- **Fuel switching and electrification:** Electrifying end uses can offer substantial efficiency gains at the final consumption level. The impact on primary energy intensity will also depend on the efficiency of the electricity generation mix.
- **Changes in the electricity generation mix:** Changes in fuels used for generation and the switch to more efficient renewable energies affect primary energy intensity, even when electricity is not used more efficiently.
- **Changes in economic structure:** Shifts in economic activity towards less or more energy-intensive sectors can affect energy intensity independently of changes in efficiency within each sub-sector.
- **Weather variations:** Annual temperature changes influence energy demand for cooling and heating, with milder years contributing to lower energy use.
- **Behavioural change:** Energy consumers might change their behaviour in response to higher prices or due to new policy support or newly available enabling infrastructure, opting for more efficient or affordable alternatives without losing access to desired energy services.
- **Demand destruction:** Households and businesses can be forced to reduce their consumption of energy because it has become too expensive, hard to access or unavailable. This can also have a negative impact on GDP, which can result in a neutral or even negative effect on the intensity indicator.

While it can be challenging, isolating the impacts of each factor can provide insights on the main drivers of intensity progress each year.

The 2026 energy intensity change is expected to reflect the impact of behavioural changes, with users reducing and adapting their mobility habits, and of demand destruction, particularly in some energy-intensive sectors. An acceleration in the switch to efficient and electrified technologies also played a role. The impact of weather is expected to be small, adding slightly over 0.2% to the overall intensity improvement, due to milder winter conditions in major heating markets and mixed summer conditions.

The following sections dive into the different aspects that have shaped energy demand and intensity changes this year.

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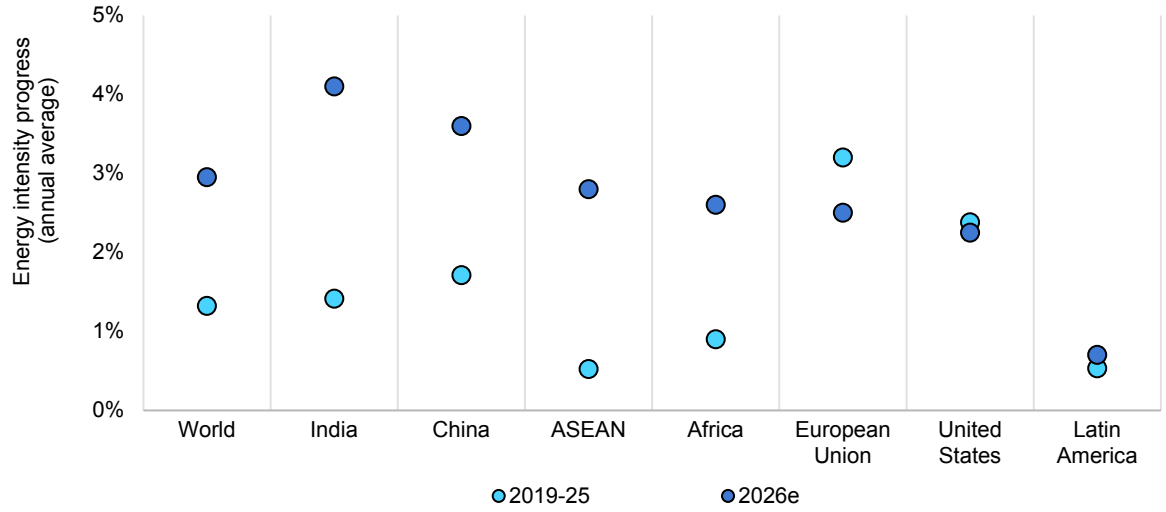
Regions hardest hit by supply shocks see the largest change in energy intensity in 2026

Expected intensity progress in 2026 shows divergence across major regions. Countries in Asia that were most exposed and reacted the fastest to the 2026 energy crisis recorded some of the strongest improvements in energy intensity. Notably, energy intensity is projected to improve by around 3.5% in the People's Republic of China (hereafter, "China"), over 4% in India and nearly 3% across Southeast Asia in 2026, well above short-term averages. Meanwhile, progress is expected to be slightly below the 2019-2025 averages in the European Union (around 2.5%) and the United States (2.3%).

One of the main drivers of intensity progress across regions this year was the response to the shock following the closure of the Strait of Hormuz, particularly in regions with high exposure to energy imports from the Middle East. Higher fuel prices placed additional pressure on household and business budgets, prompting reductions in energy use, including through reduced travel, shifts towards public transport and other alternatives. The rapid reaction through demand reduction, rerouting of supplies, fuel switching and inventory drawdowns helped cushion the disruption caused by the energy crisis.

Another important factor was the artificial intelligence-related investment and the production of associated components, supporting GDP growth this year. Economic growth in some countries was boosted by investment in data centres, while technology manufacturers, mainly in Asia, saw a large increase in activity and exports, partially offsetting the effects of the energy crisis in the economy.

Regional energy intensity progress, 2019-2026e



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Note: 2026e = estimated values for 2026.
Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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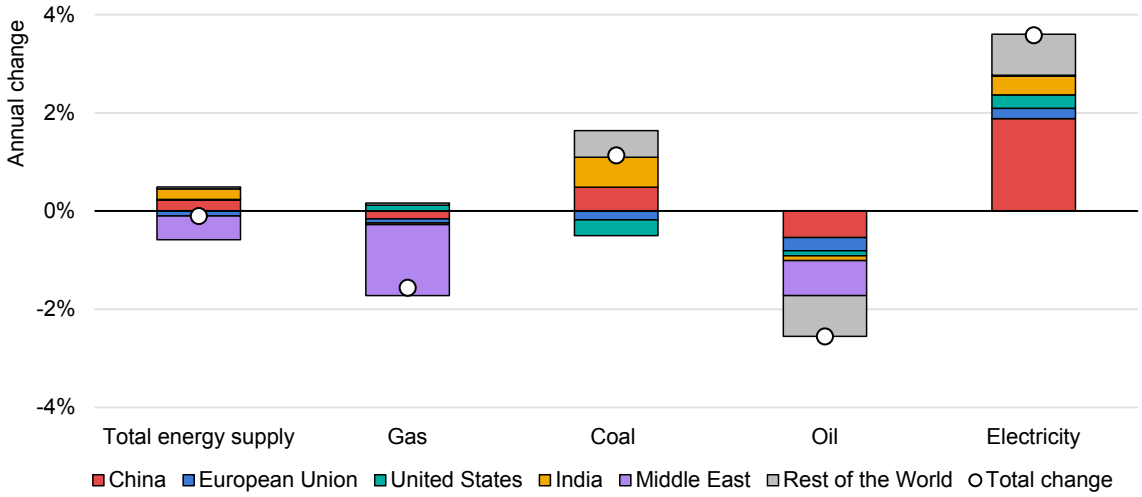
Electricity demand growth continues to outpace overall energy demand in 2026

Global electricity demand is projected to rise by 3.6% in 2026, remaining in line with its average annual growth since 2021. Growth is expected across sectors, reflecting continued electrification, industrial expansion, increased appliance ownership and rising demand from data centres. Electricity demand growth is concentrated in the world's largest economies, led by China, which accounts for more than half of the global increase. In India, growth is expected to rebound in 2026, after an early monsoon season moderated cooling demand in 2025. By contrast, some emerging economies saw a slowdown in demand due to the impact of the crisis on electricity prices and the implementation of conservation measures.

While renewables are expected to meet a large share of additional electricity demand, higher coal-fired generation in China and India, along with gas-to-coal switching in other markets, are the main drivers of the expected 1.2% increase in coal demand. Unlike coal, both oil and gas demand are expected to decrease in 2026. Supply disruptions and higher prices following the closure of the Strait of Hormuz have further contributed to a slowdown in the demand for both fuels. Oil demand is projected to decline by 2.6% this year, the first decrease since the height of the Covid-19 pandemic in 2020, as supply constraints largely impacted energy importing countries. Gas demand is set to drop by around 1.5%, driven by disruptions in gas-intensive industries in the Middle East, tight supply conditions in Asian markets, and lower use across industries and the power sector in Europe amid the strong increase in prices since the beginning of March.

Change in total energy supply and change in demand by fuel in selected regions, 2026e



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Note: 2026e = estimated values for 2026.

Sources: IEA (2026), Global Gas Security Review; IEA (2026), Electricity Mid-Year Update 2026; IEA (2026), Oil Market Report - November 2026; and IEA (2026), Coal Mid-Year Update 2026.

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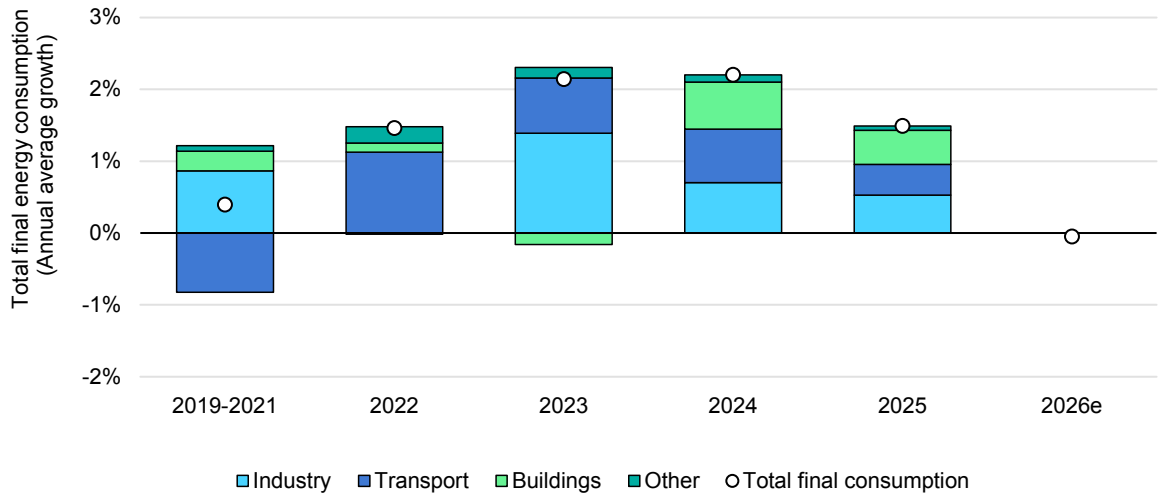
Global energy consumption growth slows down in 2026 amid crisis pressures

Total final consumption, the energy used by final consumers, is expected to show a slight decrease in 2026. After growth eased to around 1.5% in 2025 from over 2% in 2024, it was weakened further this year as higher energy prices and supply constraints weighed on consumption.

The effect of the energy crisis has been particularly evident in transport, as users changed behaviours in response to higher fuel prices, and the share of electric vehicles in global sales continues growing. This year, diesel demand is expected to decline by over 2% and gasoline demand by 1.7%. Industries relying on oil as feedstock for their processes also saw a slowdown in operations because of supply constraints and higher prices for naphtha, a primary component used to produce plastics and synthetic fibres. At the same time, conservation measures have helped moderate overall demand growth across all sectors.

The slowdown follows several years of large increases in energy demand. Since 2021, industry and transport have accounted for most of global energy demand growth, driven by the post-pandemic economic recovery and sustained industrial expansion in subsequent years. Transport energy use only returned to pre-pandemic levels in 2024, and the growing share of hybrid and electric vehicles has moderated further demand growth. Energy demand growth in buildings has been pushed upwards by rising incomes, which provide increased access to air conditioning and appliances. This was partly offset by efficiency improvements, particularly as a response to the 2022 energy crisis. Changing weather patterns have also contributed to periodic spikes in buildings energy consumption.

Change in energy demand by sector and total final consumption, world, 2019-2026e



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Source: IEA (2026), World Energy Outlook and Energy Efficiency Progress Tracker, (accessed November 2026).

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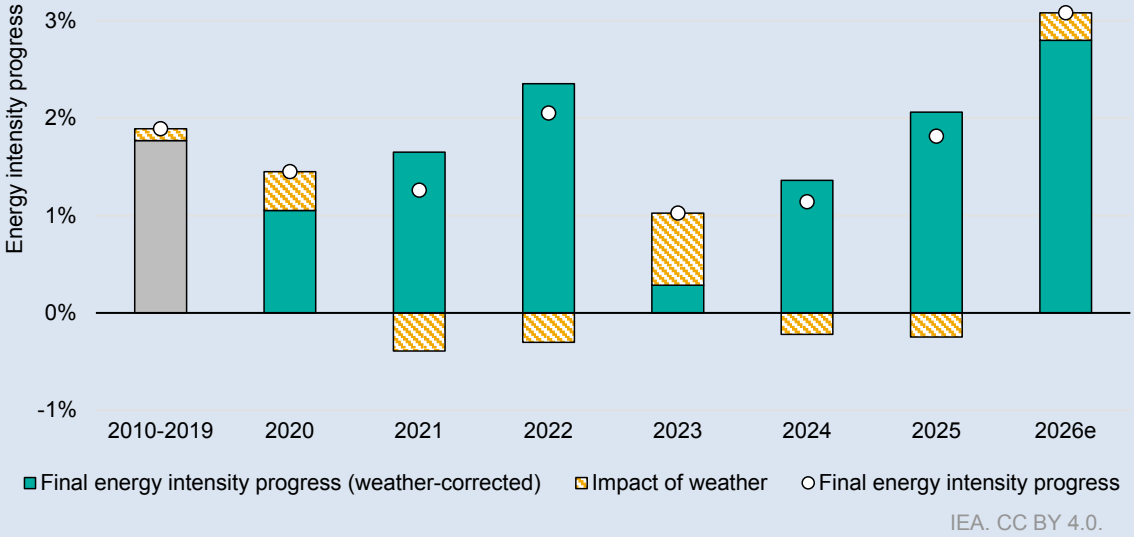
Final energy intensity points to stronger recent underlying efficiency gains

Final energy intensity provides additional insights to efficiency improvements at the end-use level, excluding the positive effects of adding renewables to the electricity generation mix on primary energy intensity, as they reduce conversion losses. Weather-correcting final energy intensity also isolates annual variations related to changes in temperatures, highlighting those resulting from a more efficient use of energy.

Weather has had a noticeable impact on recent trends. In 2023, a particularly mild winter in the northern hemisphere contributed to lower demand for heating in many countries, boosting final energy intensity improvements, while weather-corrected progress was much slower. The effect reversed in 2024, the hottest year on record, when higher cooling demand weighed on intensity metrics. So far, 2026 has seen contrasting weather patterns across regions, but the global average is expected to show slightly lower heating needs and similar cooling needs compared to 2025, measured in heating and cooling degree days. This reflects a somewhat milder heating season across most regions in the northern hemisphere and mixed summer conditions across major cooling markets.

After adjusting for these effects, final energy intensity shows a strong recovery over past years, with consistent gains since 2023. This suggests that end-use efficiency progress has continued to strengthen following the slowdown after the response to the 2022 energy crisis, which significantly accelerated efficiency progress that year.

Final energy intensity progress, weather correction and weather impact, 2010-2026e



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Notes: 2026e = estimated data for 2026. Final energy intensity is calculated as total final consumption over gross domestic product (GDP 2021 purchasing power parity).

Sources: IEA (2026), World Energy Outlook, Energy Efficiency Progress Tracker, (accessed November 2026) and Weather for Energy Tracker, (accessed 9 November 2026).

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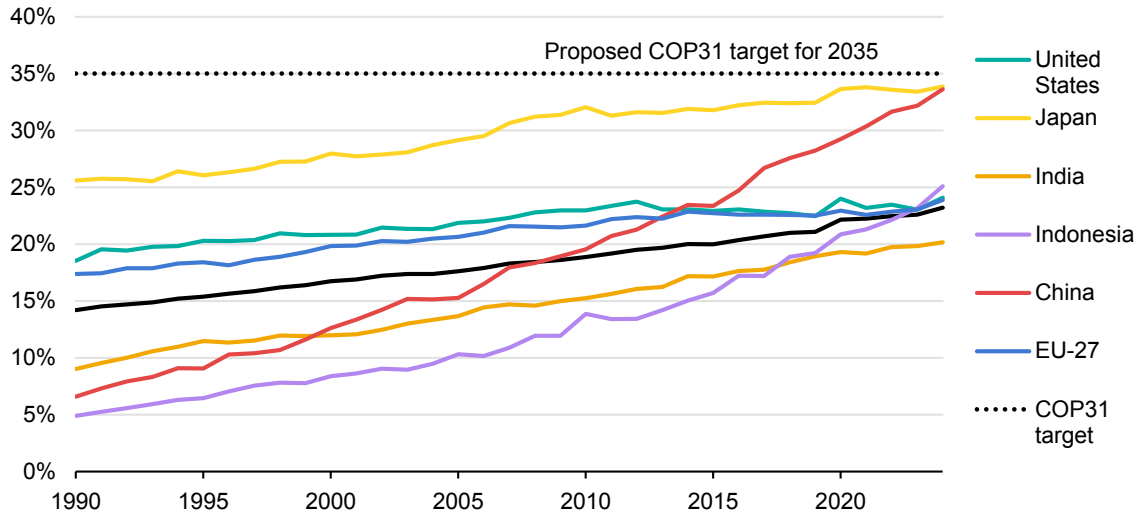
Global electrification rates continue to increase, driven by major Asian economies

Some of the largest changes in electrification rates in recent decades have taken place in Asia. Japan has long been among the most electrified economies, increasing electricity's share of total final energy consumption (TFEC) from around 25% in 1990 to 34% in 2024. China increased electricity's share of TFEC from just above 5% in 1990 to nearly 34% in 2024, with notable growth across all end-use sectors. In Indonesia, it rose from around 5% to nearly 25% between 1990 and 2024, supported by expanded electricity access in the residential sector and increased appliance ownership as a result of rising incomes. The global rate sits at 23% in 2025, but it is cost effective to raise electrification levels to around 33% with today's technology costs, providing a strong foundation for reaching the 35% global target proposed by the COP31 Presidency for 2035.

The 2026 energy crisis has sparked new momentum on electrification, with 34 governments announcing policies in response. For example, India and Indonesia announced or strengthened programmes to accelerate the rollout of electric cookstoves and the shift from gasoline to electric motorcycles. Similarly, in Southeast Asia, Cambodia, the Lao People's Democratic Republic (hereafter, "Lao PDR"), Thailand and Viet Nam lowered taxes or provided new financial support for electric vehicles. Meanwhile, the European Commission announced a new Electrification Action Plan, aiming to push its electrification rate to 46% by 2040. Canada released Powering Canada Strong, a strategy focused on expanding and modernising Canada's electricity system to support economy-wide electrification, improve energy efficiency and maintain reliable, affordable and clean electricity.

Share of electricity in total final energy consumption, by country/region, 1990-2025



IEA. CC BY 4.0.

Note: EU-27 = the current 27 member states of the European Union.
Source: IEA (2026), World Energy Balances, (accessed 9 November 2026).

IEA. CC BY 4.0.

1.2 The 2026 energy crisis response

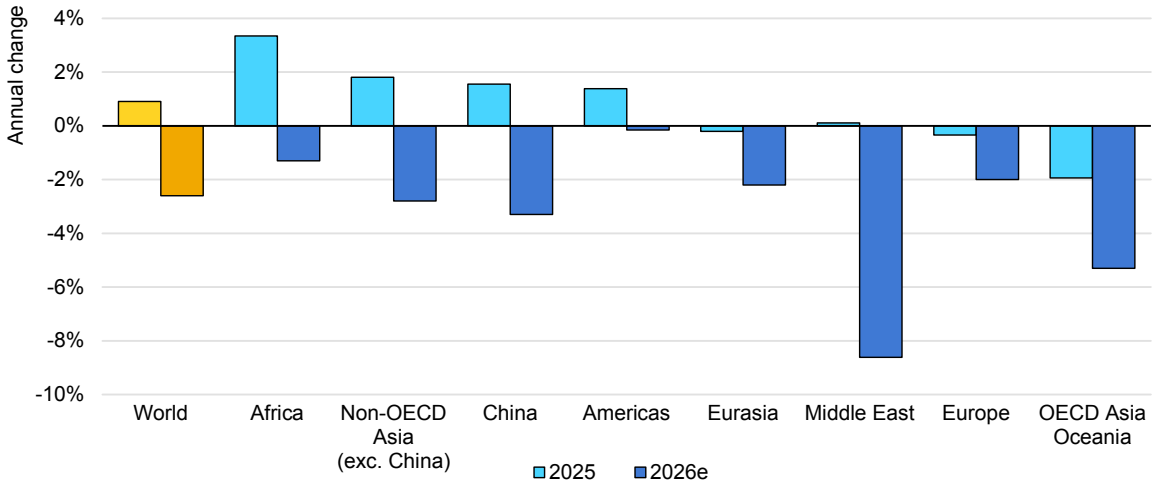
2026 crisis triggers first decline in global oil demand since 2020

The outbreak of the current conflict in the Middle East has created the largest supply disruption in the history of the global oil market, due to the near halt in shipping traffic through the Strait of Hormuz. The disruption to oil supply and the resulting surge in oil prices led to a decline in global final energy demand. The impact on demand varied significantly across regions.

This reflects differing levels of exposure, as some countries are more dependent on oil flows through the Strait of Hormuz. Oil was the most severely affected fuel globally, with demand expected to decline in 2026 for the first time since 2020. Countries in Asia, Africa and the Middle East recorded the largest changes from last year. For instance, China's demand is expected to fall by over 3%, compared to growth above 1.5% last year, while Africa's demand is expected to decline by 1.3%, after seeing the fastest growth across regions in 2025.

The Americas are an exception to the strong global oil demand slowdown, with demand expected to decline only modestly this year. While higher fuel prices have weighed on road fuel consumption, particularly in the United States, part of the decline has been offset by increased use of liquefied petroleum gas (LPG) and ethane. Additionally, oil demand in Central and South America is expected to increase slightly this year, evidencing a low reliance on crude and product imports from the Middle East.

Annual change in oil demand, by region, 2025-2026e



IEA. CC BY 4.0.

Note: 2026e = estimated values for 2026.
Source: IEA (2026), Oil Market Report – November 2026.

IEA. CC BY 4.0.

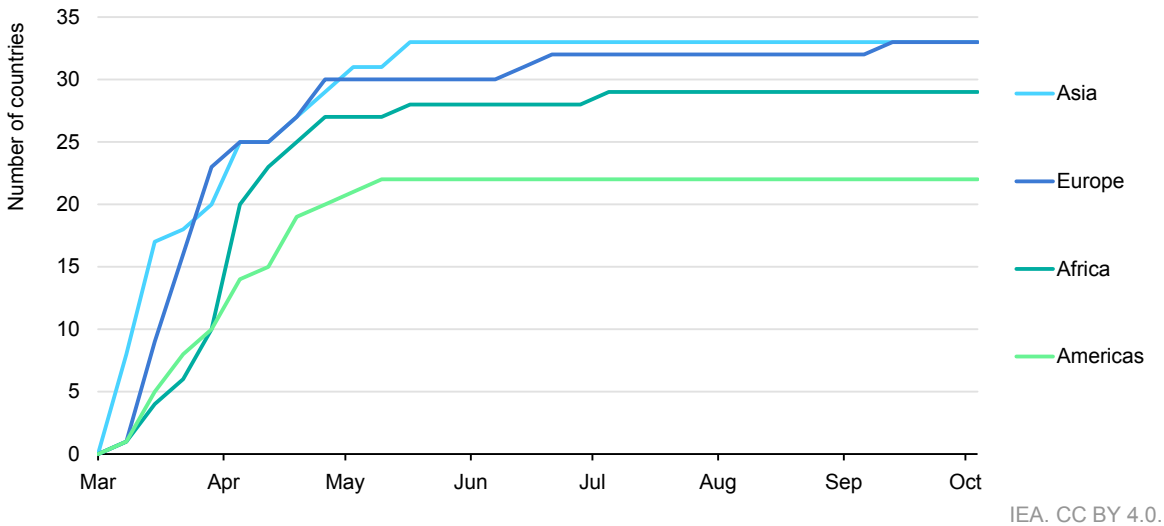
In response to the crisis, nearly 120 countries introduced measures to save energy and protect consumers

Governments around the world responded rapidly to the energy crisis triggered by the current conflict in the Middle East. By September, 118 countries had introduced emergency policy measures to manage demand, protect consumers and strengthen energy security. As reported in the IEA's 2026 Energy Crisis Policy Response Tracker, this included 61 countries taking energy conservation actions, 98 introducing price support measures to help with affordability, and 34 implementing longer-term policies to improve energy efficiency and electrification.

These demand-side measures complemented broader efforts to address the crisis on the supply side. Many governments took action to increase fuel supplies and diversify sources of energy, while the IEA co-ordinated supply-side responses, including its largest ever release of emergency oil stocks. Some governments also promoted fuel switching, and accelerated the deployment of renewable energy and electric technologies.

Countries in Asia, particularly South and Southeast Asia, were among the first to respond with demand-side policy measures, reflecting their exposure to the immediate effects of the supply shock. As the crisis persisted, governments in other regions introduced similar actions, ranging from short-term conservation measures and consumer price supports to longer-term policies aimed at reducing energy demand and improving resilience through energy efficiency. Over time, many countries extended support measures amid persistently high oil prices, although some also phased out emergency measures.

Countries implementing policies in response to the energy crisis, by region, as of 21 October 2026



IEA. CC BY 4.0.

Source: IEA (2026), 2026 Energy Crisis Policy Response Tracker, (accessed 9 November 2026).

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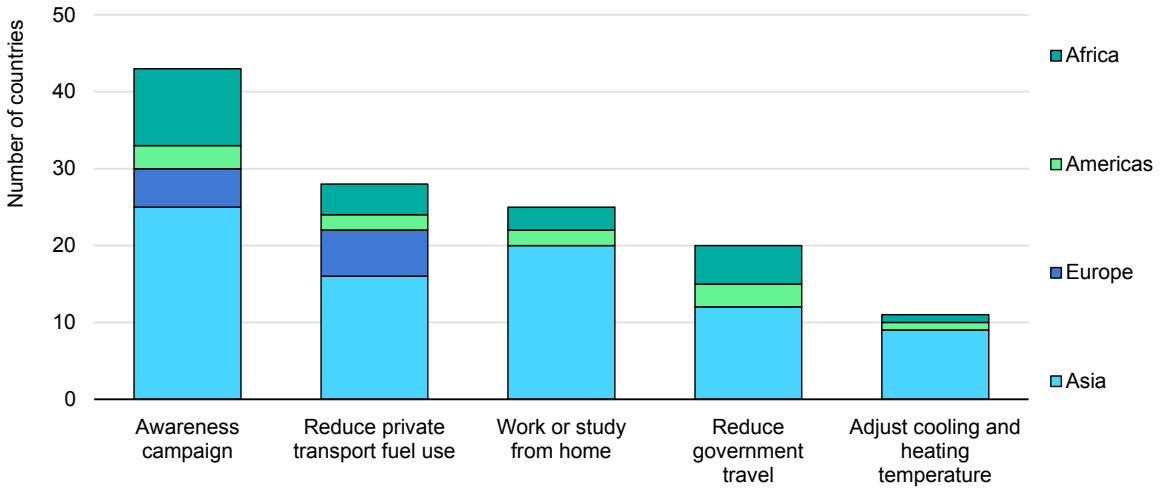
Asian countries introduced most energy conservation measures, with a focus on the transport sector

Asian countries' policies make up the largest share of conservation measures implemented in response to the current crisis, reflecting their exposure to oil supply disruptions. Many targeted transport, where fuel shortages and higher prices were felt most acutely.

Indonesia, Malaysia and the Philippines launched campaigns to encourage people to work or study from home, with public officials required and the private sector encouraged to work remotely. Some countries introduced more direct measures for private vehicle use. Bangladesh and Sri Lanka introduced a fuel-rationing system for drivers. Korea and Myanmar limited the number of days that certain vehicles could be driven, while Pakistan reduced the speed limit on highways, a measure that can save 5-10% of an individual driver's fuel use. Elsewhere, awareness campaigns were launched in many countries, including Egypt, Ireland and New Zealand, to promote energy-saving behaviours.

Air transport was also heavily affected by disruptions to jet-fuel supply. Several countries, including Malaysia, the Philippines and Thailand, restricted business air travel by government employees to conserve jet fuel. Other countries, including Bangladesh, Cambodia and Singapore, took steps to reduce electricity demand by temporarily closing some public buildings, and increasing cooling set points to reduce demand from air conditioners.

Number of countries introducing energy conservation policies in response to the 2026 crisis, by type and region, as of 21 October 2026



IEA. CC BY 4.0.

Notes: Countries are counted separately for each category. A single country may appear in multiple categories if it meets the criteria for each.

Source: IEA (2026), 2026 Energy Crisis Policy Response Tracker, (accessed 9 November 2026).

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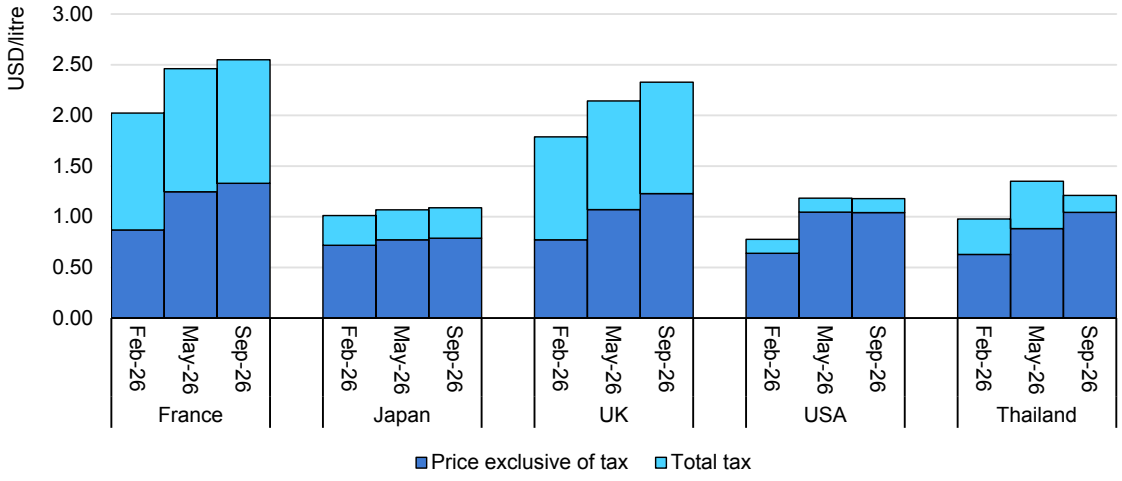
Fuel price increases varied widely as many governments intervened to limit impacts on consumers

Following the outbreak of the conflict in the Middle East on 28 February 2026, physical crude prices briefly approached USD 150 per barrel, up from around USD 70 before. However, the extent to which these increases were passed on to consumers depended heavily on domestic fuel market structures and government intervention. In some countries, pump prices rose almost in lockstep with international markets, while in others they barely moved.

Across the world, 98 governments introduced measures to shield consumers from higher energy bills, helping to moderate increases in retail fuel prices. The majority of these were in the form of fuel tax cuts, price caps or direct subsidies. While these measures reduced the immediate impact on households and businesses, they also weakened price signals that would otherwise encourage energy savings, efficiency and fuel switching.

While many countries relied on broad price support, others introduced more targeted measures that provided relief to vulnerable groups while maintaining clearer incentives to reduce energy consumption. Measures included assistance for farmers facing higher fertiliser costs, fishermen, taxi drivers and transport companies. For instance, Chile provided targeted support for taxi drivers, Colombia subsidised farmers affected by rising fertiliser prices, and Pakistan introduced targeted fuel subsidies for vulnerable groups.

Changes in the price of gasoline in selected countries, February to September 2026



IEA. CC BY 4.0.

Note: Prices refer to the weeks commencing 23 February 2026, 25 May 2026 and 28 September 2026.
Source: IEA (2026), End-use Energy Prices, (accessed 9 November 2026).

IEA. CC BY 4.0.

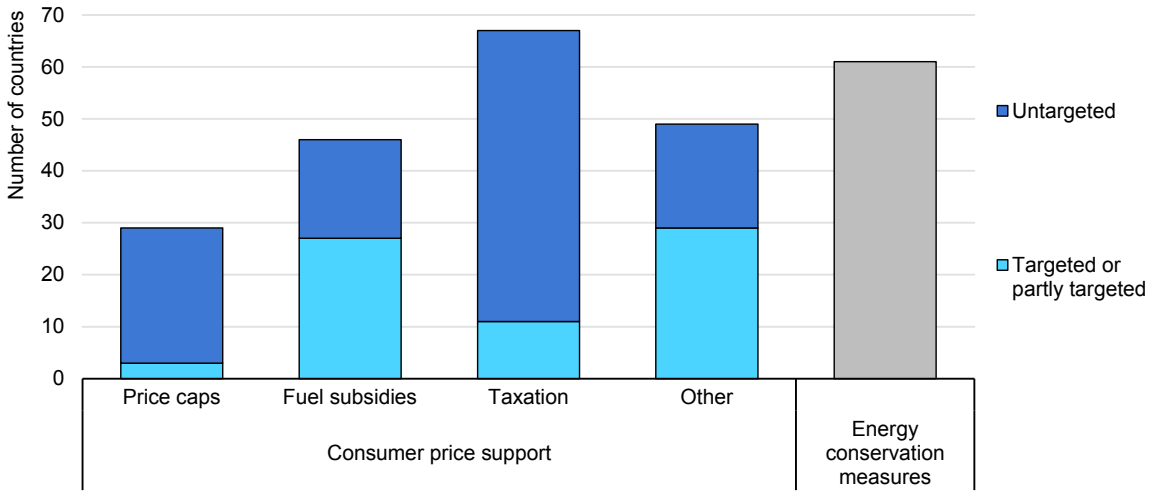
Most fiscal measures to support consumers were untargeted, putting pressure on government budgets

Most consumer support measures introduced in 2026 were broad-based, to allow rapid implementation and immediate relief. Many countries in Asia and Europe capped gasoline or diesel prices or reduced energy taxes. Such measures are deployed quickly and easy to administer but have implications for energy consumption, distributional outcomes and government budgets.

Broad-based support affects different households in different ways. Because higher-income households consume more energy, a larger share of the benefit can accrue to middle- and higher-income groups. A recent study in the Netherlands estimates that around 70% of the total value of a broad reduction in fuel excise duty ends up benefiting middle-high- and higher-income groups. At the same time, lower fuel prices can reduce incentives for energy conservation, efficiency improvements and fuel switching during periods of tight supply.

A selection of countries tracked by the IEA announced over USD 80 billion in consumer relief, yet only around 30% of this support was targeted. With public finances already under strain following the Covid-19 pandemic and the 2022 energy crisis, several governments faced trade-offs between sustaining consumer support measures and managing fiscal constraints. Some countries still pursued longer-term measures, including tax incentives on EVs in Australia, induction cookstoves support in India and solar PV funding in Thailand.

Number of countries introducing consumer support measures in response to the 2026 crisis, by type and level of targeting, as of 21 October 2026



IEA. CC BY 4.0.

Notes: Countries are counted separately for each category. A single country may appear in multiple categories if it meets the criteria for each.

Source: IEA (2026), 2026 Energy Crisis Policy Response Tracker, (accessed 9 November 2026).

IEA. CC BY 4.0.

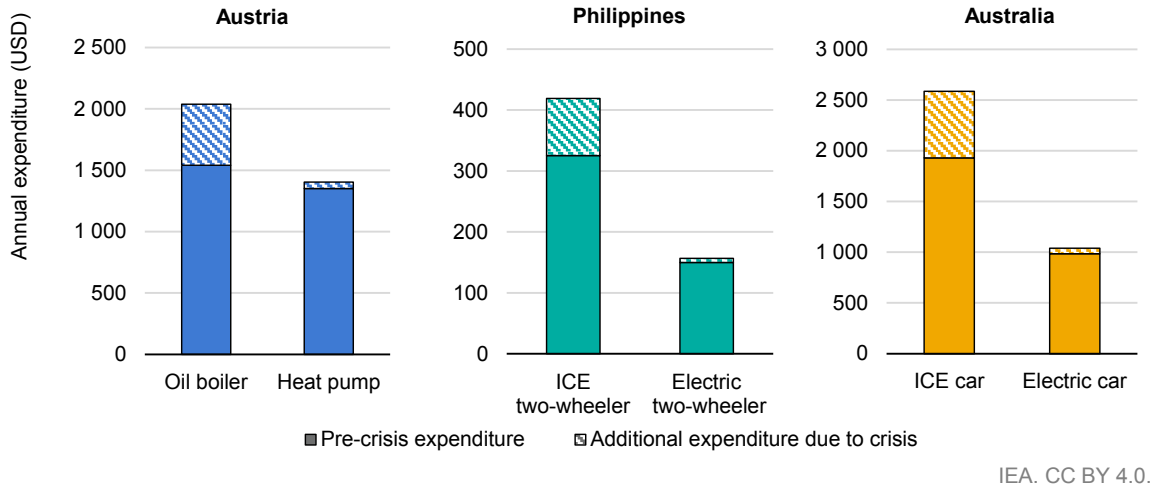
Higher fossil fuel prices strengthened the case for efficient electric technologies

Energy-efficient electric technologies generally require less energy to operate than fossil fuel alternatives. Heat pumps are three to five times more efficient than oil and gas boilers, and EVs are around three times more efficient than conventional vehicles. They typically provide significant savings throughout their lifetime, particularly where electricity prices remain competitive relative to fossil fuels. Upfront costs remain a key barrier of adoption, particularly for heat pumps, but the energy crisis has further widened the operating cost advantage, reducing payback periods and increasing their competitiveness in many markets.

For example, heating bills increased significantly in countries where many households still rely on oil-fired heating systems. In Austria, prices rose by more than 50% year-on-year in May 2026, while in Ireland they were 44% higher in September 2026. In the United Kingdom, higher fuel costs have improved the economics of switching from an oil boiler to a heat pump, with potential annual savings for a typical household of around USD 850, nearly halving energy bills.

Meanwhile in Australia, road fuel prices rose roughly 34%, compared with a 5% increase in electricity costs, which coincided with electric car sales almost tripling year-on-year in April 2026. Similar dynamics were visible in emerging markets. In Brazil, the growing cost advantage of EVs contributed to record sales in 2026, while in the Philippines higher fuel prices increased the attractiveness of electric two-wheelers, a key mode of transport where electrification rates remain low.

Average annual energy expenditure by technology in selected countries, 2026



IEA. CC BY 4.0.

Notes: Pre-crisis expenditure refers to 2025 expenditure levels. Additional expenditure reflects the increase in spending due to higher energy prices in 2026, based on the same energy consumption.
Sources: IEA (2026), Energy Prices, (accessed 9 November 2026), Energy End-uses and Efficiency Indicators , (accessed 9 November 2026) and Electric Car Markets in a Time of Uncertainty.

IEA. CC BY 4.0.

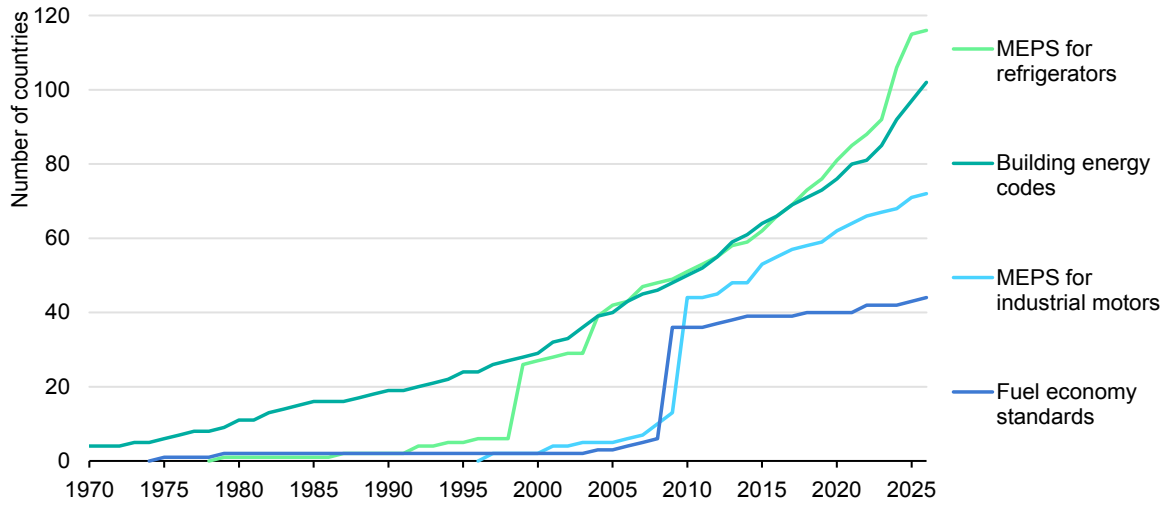
1.3 Market and policy trends

Record policy coverage in 2026 puts the focus on the strengthening of existing regulations

Energy efficiency policy coverage today is much more widespread than at previous times of crisis. Since the oil shocks of the 1970s, the number of countries with a mandatory building energy code has risen from fewer than 10 to over 100 in 2026, meaning around 60% of new buildings globally are now covered by some form of efficiency requirement. Standards for appliances and equipment, which did not exist before the 1970s oil shocks, also expanded significantly, reaching close to 120 countries today and covering over 90% of energy use for key appliances, such as fridges and air conditioners.

These new policies took years to develop, since countries needed to build policy frameworks from scratch and, in many cases, lacked the technical knowledge or adequate public organisations to do so. The result is that today, unlike in the period following the oil shocks of the 1970s, many of the key policy frameworks and policy packages are already in place, and many countries have an energy efficiency agency or equivalent organisation at some level of government. While policy coverage has expanded significantly over recent decades, policy stringency still lags technological progress, leaving efficiency gains untapped. Strengthening existing policies is generally simpler and less costly than creating entirely new frameworks, meaning that policy responses to the current crisis can be implemented in the shorter term by raising ambition and adapting existing successful policies to the national context.

Evolution of selected energy efficiency policies, 1970-2026



IEA. CC BY 4.0.

Note: Large annual changes reflect adoption in country blocs.

IEA. CC BY 4.0.

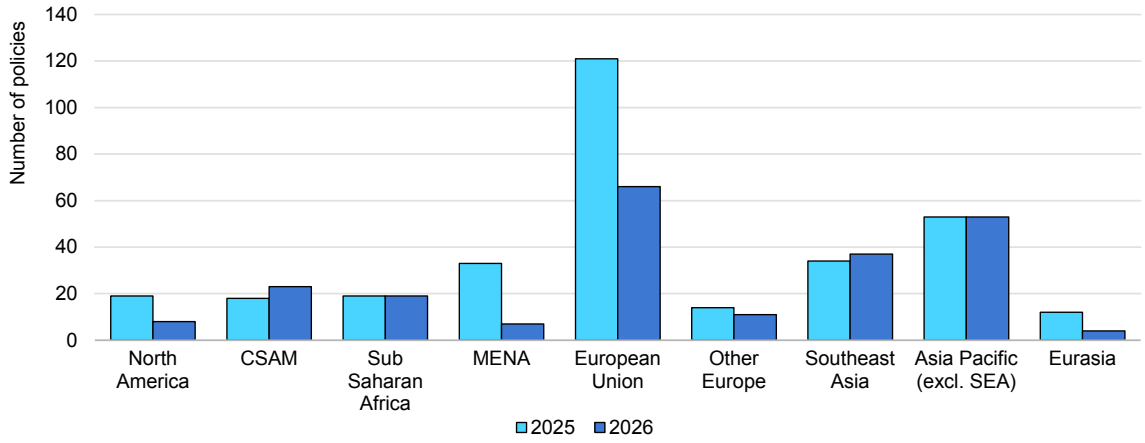
The 2026 crisis could be a turning point, if translated into lasting policy changes

The 2026 energy crisis has prompted a range of policy responses but has not triggered a broad wave of new energy efficiency frameworks. Governments have introduced measures to support electrification, strengthen energy efficiency and improve long-term energy security, alongside actions to protect consumers and reduce immediate pressures on energy systems. These efforts build on a much stronger policy foundation than existed during previous energy crises.

At the same time, preliminary data suggest that, despite the current crisis, the number of new or updated energy efficiency policies announced in 2026 is lower than in 2025 in many regions.

The number of policy updates is not a perfect measure of ambition or impact. A single revision to a major building code, appliance standard or vehicle regulation can sometimes have a greater effect than multiple smaller measures. Moreover, many of the policies introduced in response to the crisis are still being put in place, and their impact will take time to emerge. As seen in previous crises, long-term structural policies can take time to be developed, approved and implemented, meaning higher policy activity could emerge in the coming years as a response to the current crisis.

Number of new or updated energy efficiency-related policies, by region, 2025-2026



IEA. CC BY 4.0.

Notes: CSAM = Central and South America. MENA = Middle East and North Africa. EU = European Union and European Commission policies not attributable to individual member states. SEA = Southeast Asia. Asia Pacific (excl. SEA) refers to Asia excluding Southeast Asia and includes Oceania. Data for 2025 and 2026 cover the period 1 January to 30 October in each year.

IEA. CC BY 4.0.

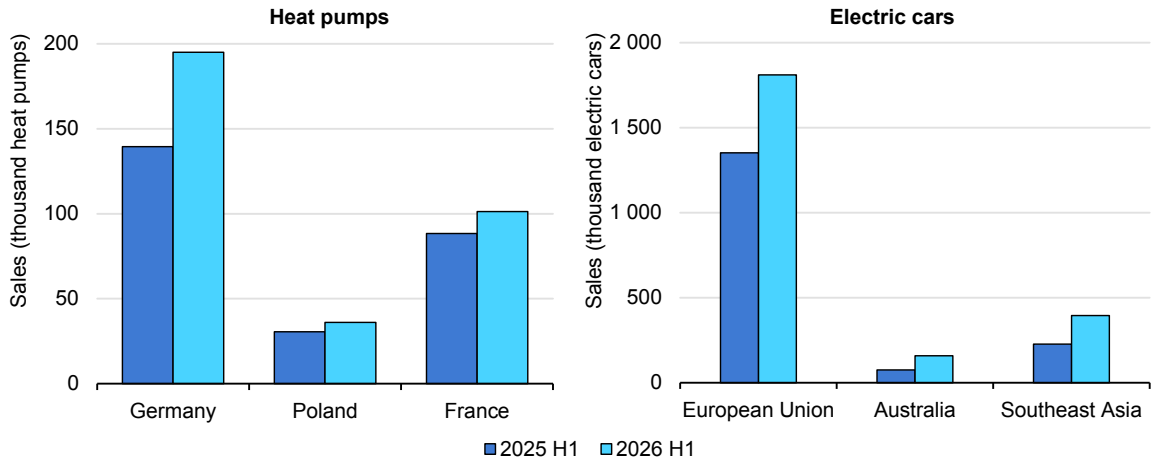
Rising sales suggest the 2026 crisis is accelerating the adoption of efficient technologies

The experience of past crises suggests that periods of disruption can accelerate adoption of new fuels and technologies. While it is too early to determine whether 2026 will have a similar long-term impact, there are early signs that higher fossil fuel prices are increasing demand for efficient electric technologies.

Some governments have already responded with measures to support electrification. Several countries, particularly in Southeast Asia, have introduced temporary EV tax breaks, scrappage initiatives and fleet electrification programmes in response to the crisis. Although the full impact of consumer and policy responses will take time to emerge, several regions across the world saw consumers leaning towards electric vehicles as a response to higher gasoline prices. Global EV sales rebounded in the second quarter of 2026, even as overall car sales declined, with EV sales growing in more than 90 countries over the first half of the year, compared to the same period in 2025.

Similarly, residential heat pump sales rose by 11% year-on-year across 12 European countries in the first half of 2026, with stronger growth in several major markets, including 40% in Germany and 15% in France. While this increase also reflects prior policy support and underlying market trends, rising gas and oil prices following disruptions to global energy supplies have further accelerated consumer demand.

Sales of efficient technologies in selected countries and percentage change from previous year, H1 2025-2026



IEA. CC BY 4.0.

Notes: Heat pump sales are expressed in number of units sold.

Source: IEA analysis based on data from the European Heat Pump Association (2026), Energy crisis sees rise in heat pump sales (news) and IEA (2026), Electric Car Markets in a Time of Uncertainty.

IEA. CC BY 4.0.

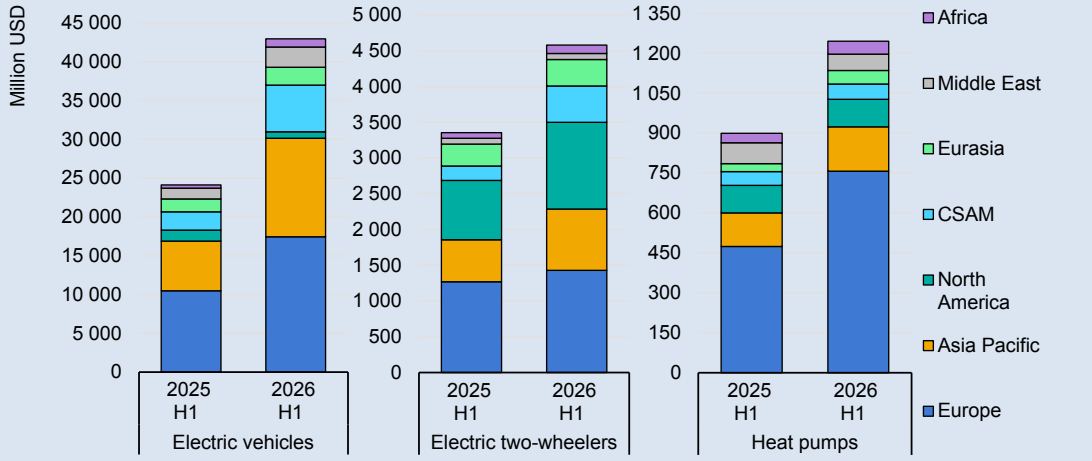
A large share of additional demand for efficient technologies has been met through higher Chinese exports

In the first half of 2026, China's exports of efficient technologies increased sharply, most notably for EVs and heat pumps. Compared to the same period in the previous year, export values increased by 78% for EVs and 39% for heat pumps, while the volume of EV exports more than doubled in the first half of 2026.

This was partly driven by the global oil price shock triggered by the current Middle East energy crisis. Although price increases and supply constraints were disproportionate across regions, the shock appears to have renewed and strengthened interest in efficient electrified technologies around the world as a hedge against oil price volatility.

China's exports data highlight Europe's growing role as a key market for efficient technologies. Europe and Asia Pacific together accounted for around 70% of China's EV export value in the first half of 2026. Europe also drove most of the increase in Chinese heat pump exports, representing just over 60% of total export value over the same period and reflecting an increase in the demand for heat pumps across the region in the first half of the year.

China's export value of efficient technologies by destination, H1 2026



IEA. CC BY 4.0.

Notes: H1 = first six months of the year. Electric vehicles include battery electric vehicle and plug-in hybrid electric vehicle passenger cars. Heat pumps include air-to-air, air-to-water, water-to-water and ground-source. HS codes to identify commodities: 870380, 870360, 870370 (electric vehicles); 841581, 841861 (heat pumps); and 871160 (electric two-wheelers).

Source: IEA (2026) analysis based on General Administration of Customs People's Republic of China (2026), Customs statistics, (accessed 5 October 2026).

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2026 saw countries reaffirming the role of energy efficiency in long-term resilience strategies

Past crises showed that energy efficiency can strengthen resilience by reducing fuel imports and exposure to energy price shocks. In 2026, governments are increasingly framing energy efficiency in similar terms, viewing it not only as a tool for reducing emissions, but also as a way to improve energy security and resilience.

This shift was evident across several international initiatives in 2026. At the IEA's 11th Annual Global Conference on Energy Efficiency on 29-30 June, co-hosted in Montreal with the Government of Canada in partnership with Hydro-Québec, countries recalled that without the efficiency improvements introduced after the oil shocks of the 1970s, global energy demand would be around twice as high today. Ministers subsequently issued a joint statement that reaffirmed their commitment to doubling the global rate of energy efficiency improvements by 2030 and highlighted efficiency as a cornerstone of long-term resilience.

A parallel CEO Roundtable, hosted by Energy Efficiency Movement and Hydro-Québec, brought together senior leaders from industry, finance, government and international organisations to identify practical ways to accelerate energy efficiency implementation. The roundtable resulted in the Montreal Collaboration Framework, a joint framework to strengthen collaboration between industry, policy makers and financial institutions to double the global rate of energy efficiency progress by 2030. With implementation at its core, the Framework provides a roadmap for co-ordinated action to accelerate large-scale deployment and deliver economic, energy security and decarbonisation benefits.

The emphasis on resilience was not limited to the Montreal Conference. Earlier in June, G7 leaders, meeting under the French presidency, underscored in a joint statement the importance of strengthening the resilience of economies through more efficient energy systems. They also highlighted the role of international co-operation, including through organisations such as the IEA, in helping countries respond to current and future energy security challenges.

The same themes are emerging in other international processes. The COP31 Presidency of Türkiye and Australia identified both energy efficiency and electrification as priorities under their COP31 Action Agenda. They proposed targets to raise the global electrification rate to 35% and reduce buildings energy intensity by at least 25% by 2035. The IEA has been designated a strategic partner to support this work and has been tasked with developing analysis related to these goals.

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1.4 Investment

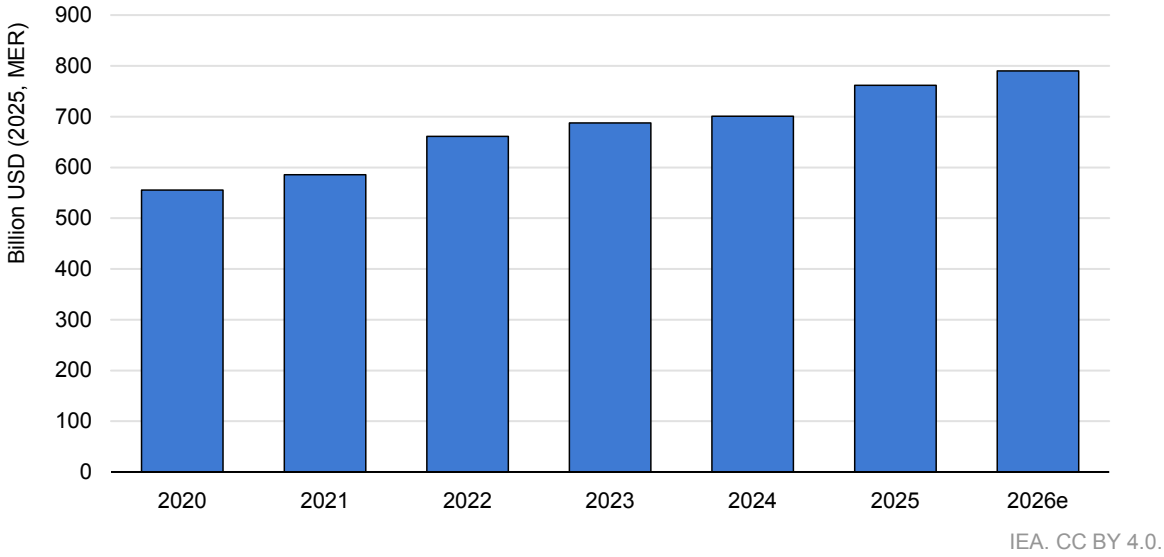
Investment in efficiency and electrification reaches a new high in 2026, up 42% since 2020

Investment in energy efficiency and electrification (additional capital expenditure for more efficient or electrified technologies relative to a baseline technology) is expected to reach USD 790 billion in 2026, up 4% from 2025 and around 42% higher than in 2020 in real terms. Growth has been supported by structural responses to recent energy crises and an acceleration in electrification across sectors.

The buildings sector remains the largest destination for investment in energy efficiency and electrification. Following a modest decline amid economic pressures in 2025, investment is projected to recover in 2026. However, the sector's share of total investment is expected to fall from 62% in 2020 to 49% in 2026, as investment in transport increases further.

At the same time, higher oil prices, an increased offer of affordable models, energy security concerns and policy momentum have accelerated the adoption of EVs, increasing the transport sector's share of end-use investment. Global transport efficiency and electrification investment is expected to reach around USD 360 billion in 2026, including around USD 295 billion in EVs. China and Europe jointly account for around 90% of investment in transport electrification.

Global investment in energy efficiency, electrification and other end-use technologies, 2020-2026e



IEA. CC BY 4.0.

Notes: 2026e = estimated values for 2026. MER = market exchange rate. An efficiency investment is defined as the incremental spending to acquire a piece of equipment that is more efficient than the local market average.
Source: IEA (2026), World Energy Investment 2026.

IEA. CC BY 4.0.

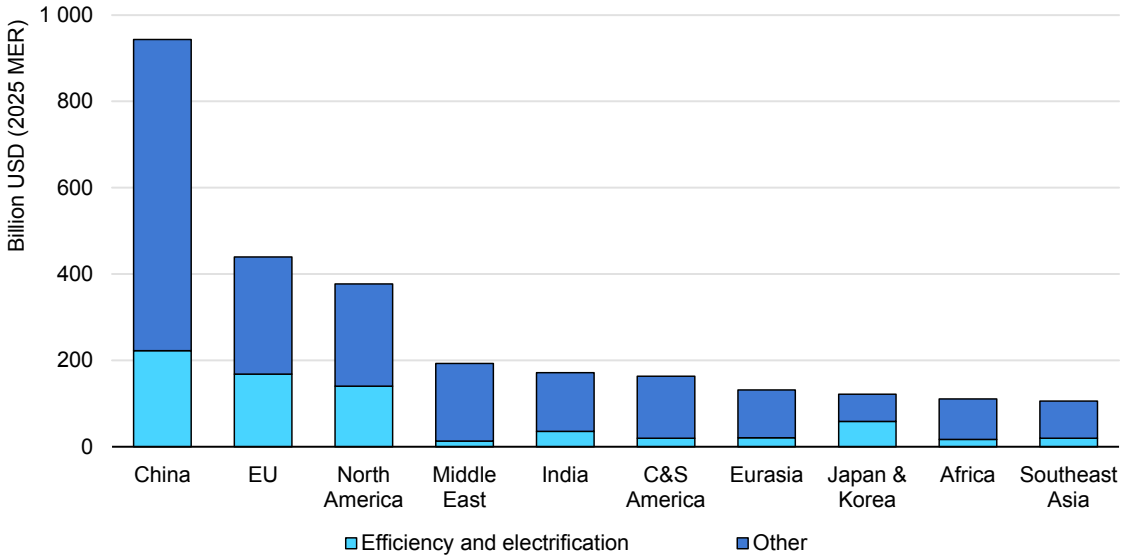
Advanced economies and China account for over 75% of efficiency and electrification investment

Most end-use investment is concentrated in China, the European Union and North America. End-use investments in China continue to be the highest globally and are expected to increase by about 4% in 2026. The European Union is posting similar growth this year, while Japan, Korea and Southeast Asia are expected to see larger gains, with the latter reaching about 14% year-on-year.

In 2026, investment in efficiency and electrification is expected to represent about a quarter of total energy investment, including fossil fuels and electricity supply. This share is lower in countries where rapid economic growth and rising income levels provide increasing access to energy services, resulting in higher investment focused on expanding energy supply. Regions where energy and electricity demand growth is slower usually show higher shares of investment in end uses over total energy investment, reaching up to 40%.

As part of its 2026 Clean Energy Investment Strategy, the European Union announced an Energy Efficiency Financing Package to scale up public and private end-use investment. The Netherlands also recently launched an energy efficiency loan plan for small and medium-sized enterprises (SMEs) as a way to mobilise private investment. Meanwhile, Korea introduced additional financial support for efficiency improvements for low-income households and electric vehicles for SMEs, and Japan introduced subsidies and tax reliefs for renovations through the Housing Energy-Saving 2026 Campaign.

Total energy investment by target sector and region, 2026e



IEA. CC BY 4.0.

Notes: 2026e = estimated values for 2026. EU = European Union. C&S America = Central and South America. Other includes investment in fossil fuels and low-emissions supply, power generation, and grids and storage.

Source: IEA analysis based on IEA (2026), World Energy Investment 2026.

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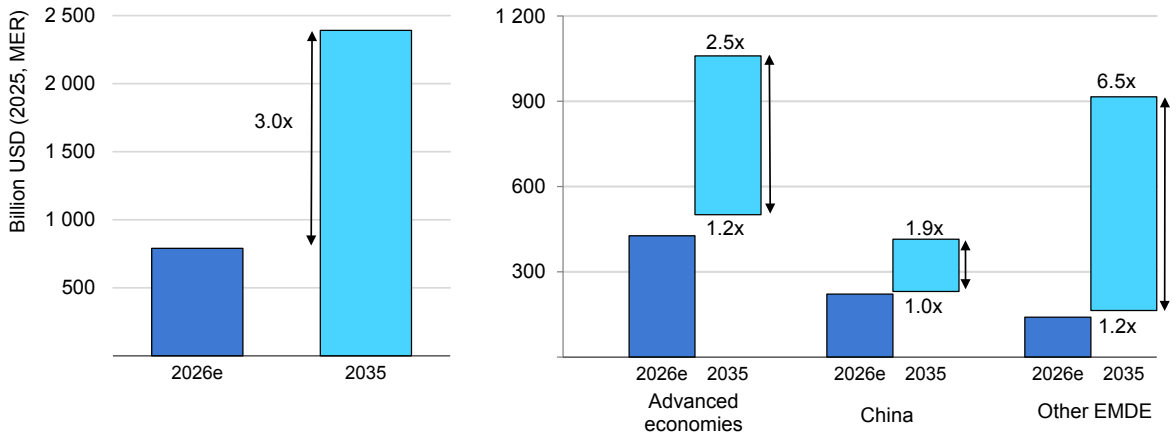
Current investment growth remains far below levels needed to achieve doubling goal

Despite reaching a new high in 2026, investment in efficiency and electrification remains well below levels needed to meet future energy objectives. Achieving a pathway consistent with the COP28 target of doubling energy efficiency progress by 2030 would require end-use investment to triple through 2030 and to reach USD 2.4 trillion per year by 2035.

Closing the investment gap will require increased spending across all regions, but the challenge is particularly acute in emerging markets and developing economies (EMDE). While end-use investment in advanced economies would need to increase by up to 2.5 times to align with a pathway to doubling energy efficiency progress, investment in EMDEs would need to increase by up to 6.5 times. These economies account for the 775 million people without access to electricity and the 2.4 billion people without access to clean cooking fuels, underscoring the scale of unmet energy needs. Many countries also remain highly dependent on fossil fuels, making energy efficiency and electrification increasingly important for improving energy security and sheltering consumers from future shocks.

End-use-sector investment (left) and by country grouping (right) in 2026e, and IEA scenario ranges for 2035



IEA. CC BY 4.0.

Notes: 2026e = estimated values for 2026. Minimum and maximum 2035 values correspond to scenarios with different levels of ambition, ranging from a scenario with current policy settings to a scenario aligned with a pathway to doubling energy efficiency progress by 2030.

Source: IEA analysis based on IEA (2026), World Energy Investment 2026.

IEA. CC BY 4.0.

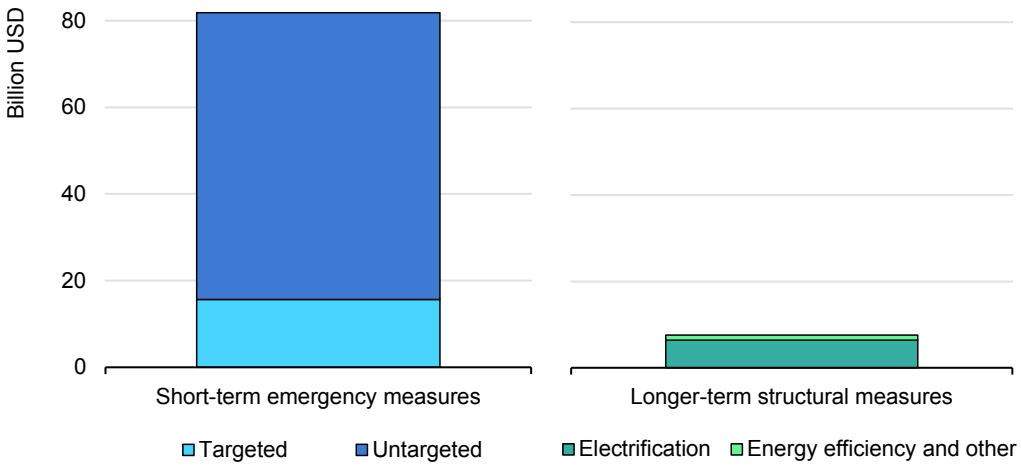
Governments prioritised consumer support over structural energy measures during the crisis

Governments dedicated extensive fiscal budgets in response to the 2026 energy crisis. Across regions, spending was generally focused on immediate consumer relief, with a smaller share directed towards measures that can reduce long-term fossil fuel dependence.

Among governments that introduced short-term consumer support measures during the 2026 crisis, nearly two-thirds implemented untargeted measures, with 98 countries implementing reduced energy taxes, fuel subsidies and price caps. While these measures can reduce immediate pressure on consumers, about half of government spending on short-term emergency measures benefited the top 40% of earners across a range of analysed countries. Targeted approaches were also used to help shield those most affected by higher energy prices while limiting the fiscal cost of broad-based subsidies, including taxi drivers in Chile and the Philippines, students in Croatia and vulnerable households in Korea.

By contrast, announced spending commitments on structural measures have focused on electrification, particularly through support for electric vehicles and heat pumps. For example, the United Kingdom increased heat pump grants for homes heated by oil and LPG. Thailand's USD 12 billion emergency package combined and equally split funding across targeted support measures and long-term solutions to improve energy resilience. Fewer spending announcements have been directed towards non-electrification efficiency measures.

Government spending commitments announced in response to the energy crisis in selected countries, by type, as announced before 31 August 2026



IEA. CC BY 4.0.

Notes: Based on government spending data across 26 countries where it is available. Measures are included if they are in response to the 2026 energy crisis and incurred a fiscal cost, with only additional spending counted for expanded schemes.
Source: IEA analysis based on IEA (2026), 2026 Energy Crisis Policy Response Tracker, (accessed 9 November 2026).

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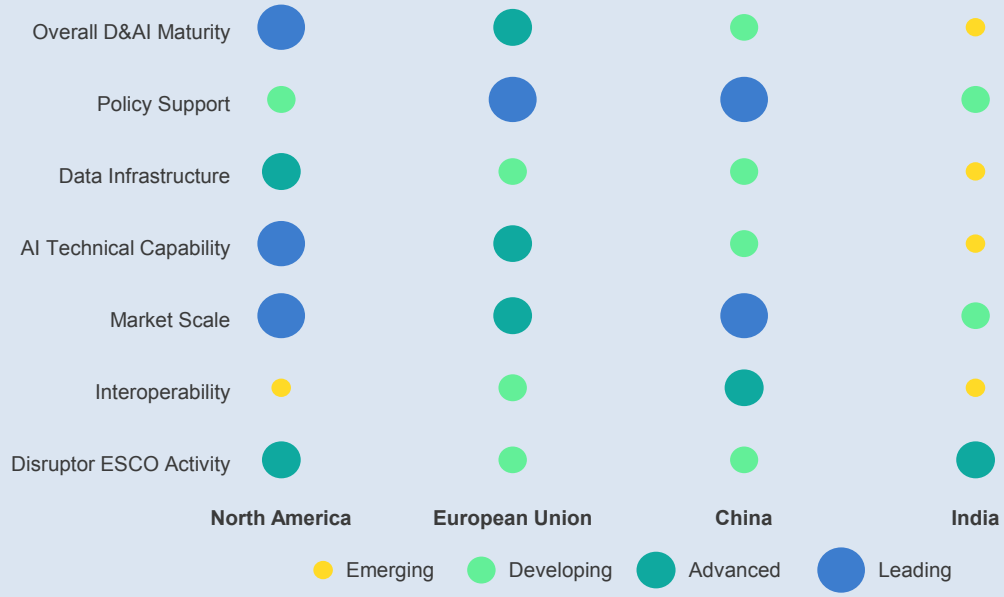
Digitalisation and AI adoption are advancing unevenly across ESCO markets

Energy service companies (ESCOs) are increasingly using digital tools, with adoption of artificial intelligence (AI) and digital technology becoming an important factor in market development. Deployment, however, remains uneven across regions. An assessment based on expert interviews across major ESCO markets found that markets with dedicated policies and more developed digital energy ecosystems show higher levels of adoption. For example, the European Union published a Strategic Roadmap for Digitalisation and AI in Energy, while China launched an AI + Energy initiative and digital energy management guidelines. These can create the enabling conditions for wider uptake in ESCO services.

Around 70% of ESCO projects in China apply some form of digitalisation and AI (D&AI), although adoption depth varies considerably by company size. India has prioritised smart meter deployment and grid digitalisation, expanding the availability of energy data for future D&AI applications. In North America, adoption has been driven by a mature ESCO market and strong private-sector capabilities, with applications focused on predictive maintenance, asset management and distributed energy resource management. Despite growing uptake, significant barriers remain. Common challenges include fragmented data, limited interoperability, uneven digital maturity, shortages of AI skills and the high cost of adoption for smaller ESCOs. Addressing these barriers will require supportive regulatory frameworks, improved access to energy data, AI-compatible measurement and verification standards, workforce development and targeted support for smaller firms.

Assessment of key enablers for D&AI readiness across major ESCO markets



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Source: IEA analysis based on interviews and stakeholder workshops conducted as a part of the “Digitalisation, Artificial Intelligence, Finance and ESCOs” project for the IEA (2026).

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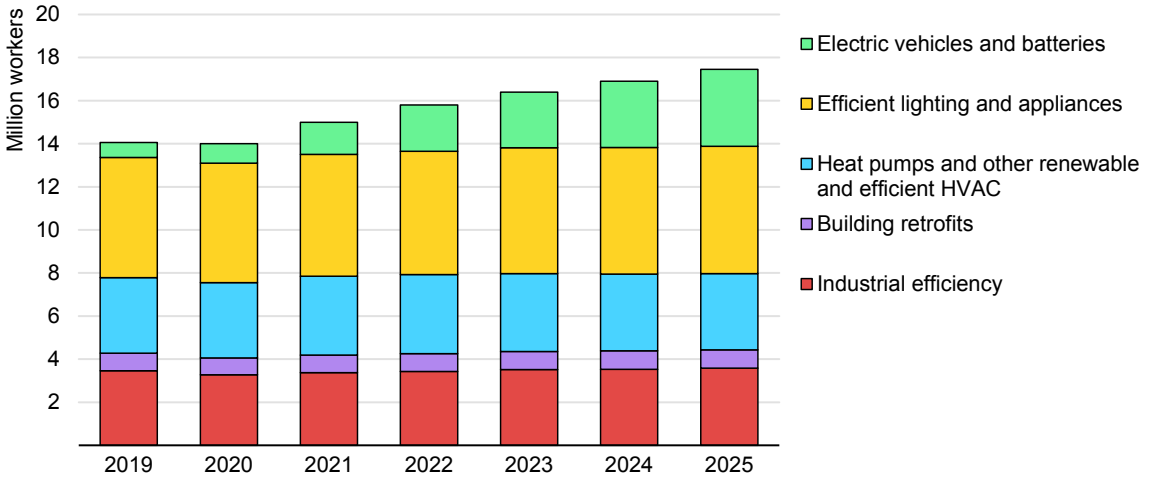
1.5 Employment

Energy efficiency and electrification job growth accelerates, driven by EVs and battery manufacturing

The global energy efficiency workforce, which includes industrial and building efficiency as well as EVs and battery manufacturing, reached around 17.4 million workers in 2025, the latest year for which data is available. Employment in the sector grew 3.2% year-on-year in 2025, up from 3.1% in 2024, although mostly driven by EVs, outpacing employment in the wider economy, which grew at a 1% rate. Around 60% of the workforce is concentrated in buildings efficiency, while industrial efficiency accounts for around 20% and EVs and battery manufacturing account for the remaining 20%.

Employment in buildings efficiency – which includes heat pumps and other renewable and efficient heating, ventilation, and air conditioning equipment (HVAC), efficient lighting and appliances, and building retrofits – remained stagnant in 2025, following the previous year's trend. This trend was largely driven by the phase-out of broad-based public support measures and a shift towards more targeted subsidy schemes. EVs and batteries remain the main drivers of job creation, with around 490 000 new jobs in 2025, while EVs reached a quarter of car sales globally. Industrial efficiency employment, which includes workers carrying out tasks such as performing energy audits and implementing process efficiency updates, saw a 1% rise in 2025 after stagnating in 2024.

Global energy efficiency-related employment, by sector, 2019-2025



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Notes: HVAC = heating, ventilation, and air conditioning. Other renewable and efficient HVAC includes systems such as those using geothermal heating, bioenergy heating and solar heating. For further information on the methodology used to estimate employment figures, see the IEA Global Energy and Climate Model.

Source: IEA (forthcoming), *World Energy Employment 2026*.

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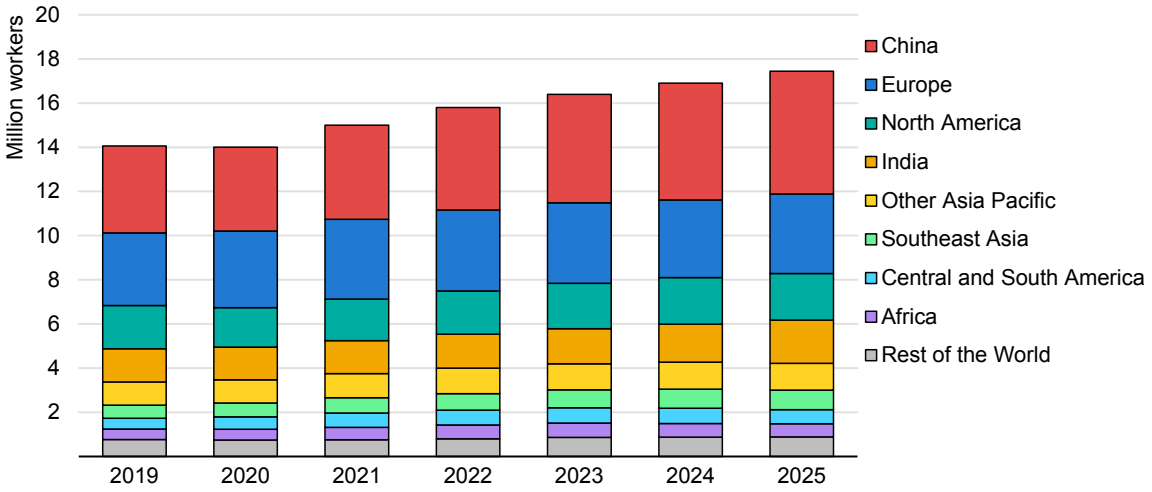
India and China saw the fastest growth in energy efficiency and electrification employment

Energy efficiency employment trends are increasingly dominated by Asia Pacific, which accounted for 55% of the global energy efficiency workforce in 2025, up from 50% in 2019. Employment in China grew by around 5% in 2025, largely driven by EVs and batteries, where China accounted for six out of ten job additions globally. Building efficiency employment remained stagnant in 2025, reflecting the structural slowdown of the real estate sector in China. Meanwhile, India had the highest employment growth in 2025, driven by industry efficiency, where the ADEETIE Scheme offered interest rate subsidies for SMEs. Employment in Southeast Asia grew at an average rate of 8% between 2019 and 2025, twice as fast as the global average. Recent policy developments suggest continued growth in the coming years. For instance, Malaysia introduced its Energy Efficiency Policy 2026-2035, creating around 29 000 jobs in the coming years.

Energy efficiency employment in Europe increased 2.5% in 2025, outpacing the average annual growth rate of 1% from 2019 to 2024. This increase was driven by EV and battery manufacturing, with new facilities opening in France, Hungary and Spain. Job growth in Europe could further increase in 2026, for example with France's electrification action plan that expects to reach 600 000 jobs by 2030 across energy efficiency and electrification. Across North America, energy efficiency employment remained stable in 2025, with some household building retrofit grants phased out in the United States, while Canada's 2026-2030 Sustainable Jobs Action Plan expands support to institutions delivering energy efficiency training, which could lead to job creation in the coming years.

Energy efficiency-related employment, by region, 2019-2025



IEA. CC BY 4.0.

Source: IEA (forthcoming), *World Energy Employment 2026*.

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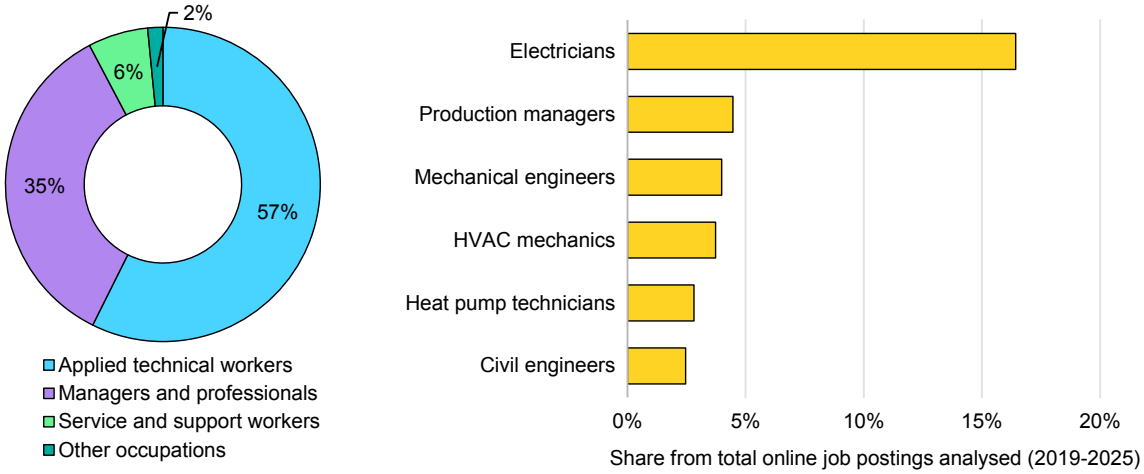
Applied technical workers are the most in-demand occupations in energy efficiency

Online job postings provide a granular overview of labour demand, allowing tracking of in-demand occupations and skills, compared to employment statistics, which measure the stock of workers employed in an economy. New IEA analysis of more than 9 000 energy efficiency job postings across Austria, Canada, Germany, India, Indonesia, Ireland, Italy, Mexico, the United Kingdom and the United States shows that 57% of all advertisements in 2025 were for applied technical workers, such as electricians and HVAC installers, who install efficient lighting, EV charging and HVAC equipment. Technical roles are in shortage across the wider economy, and these occupations require vocational qualifications, with longer lead times to bring skilled workers into the market.

More than one-third of all energy-efficiency-related job postings in the countries analysed were recruiting managers and professionals, who typically require tertiary education. This group includes workers such as project managers, who lead strategies to reduce the energy intensity of industrial processes and buildings, as well as engineers who design energy-efficient systems by, for instance, selecting the right materials and components to optimise energy performance and evaluating system configuration and control strategies.

Share of occupational groups from energy efficiency online job postings, 2025 (left), and cumulative number of online job postings for key occupations, 2019-2025 (right).



Notes: Countries covered include Austria, Canada, Germany, India, Indonesia, Ireland, Italy, Mexico, the United Kingdom and the United States. Applied technical workers include the ISCO-08 occupational groups craft and trades workers (e.g. electricians), technicians and associate professionals (e.g. heat pump technicians), and plant and machine operators (e.g. assemblers). Managers and professionals include the ISCO-08 occupational groups' managers (e.g. production managers), professionals and engineers (e.g. mechanical engineers). Service and support workers include the ISCO-08 occupational groups' administrative workers (e.g. secretaries) and service and sales workers (e.g. customer service representatives). Other occupations include the ISCO-08 occupational groups' elementary occupations (e.g. construction labourers) and workers not elsewhere classified.

Source: IEA analysis based on data from Lightcast.

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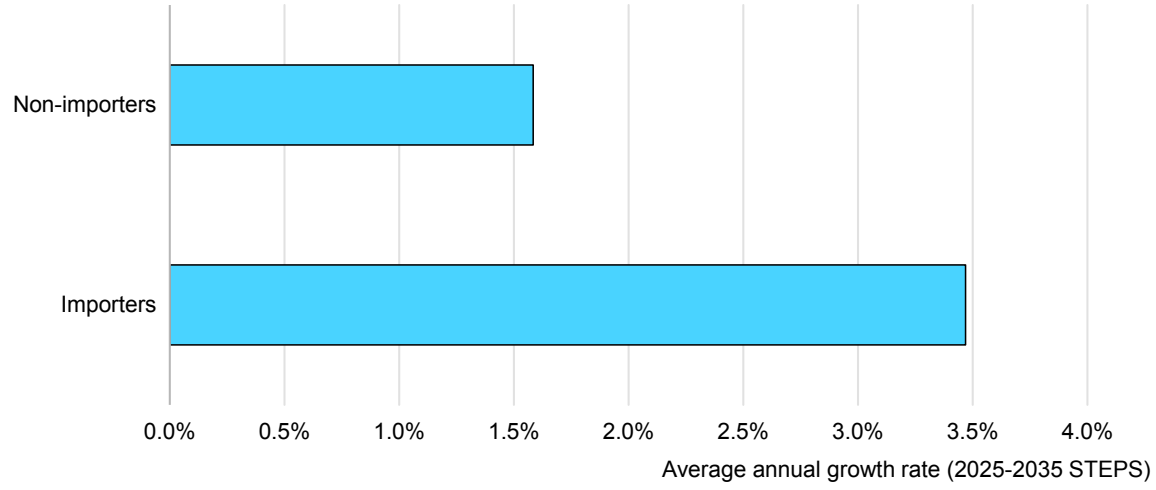
Efficiency and electrification employment in oil and gas importing countries grows through 2035

The effects of the 2026 energy crisis on the energy efficiency workforce are expected to materialise gradually rather than immediately. In the IEA's Stated Policies Scenario (STEPS), job creation remains robust in the medium term, with energy efficiency employment expanding at an average annual growth rate of 3% through 2035, reaching 23.5 million workers globally. Growth is led by EVs and batteries (8% average annual growth), followed by industrial efficiency (2%) and buildings (1%).

The 2026 energy crisis accelerated the uptake of energy-efficient technologies in oil and gas importing countries, creating employment opportunities. In France, Germany and the Netherlands, heat pump applications reached record levels in the first half of 2026. However, recent boom-and-bust cycles in heat pump demand have created workforce constraints, as many installers have left the sector. As a result, in the STEPS, building efficiency employment increases by 10% in importer countries between 2025 and 2035 after years of stagnation.

Accelerated deployment of energy efficiency measures is met by skills shortages. The 2026 IEA Energy Employment Survey, which gathered policy makers' responses from national ministries and energy and skills institutions across 37 countries, found that 55% of respondents saw skills shortages in the energy efficiency sector of their countries, resulting in operational bottlenecks, such as project delays. Solving these skills shortages is important for the implementation of energy efficiency policy measures.

Average annual energy efficiency-related employment growth in the STEPS, 2025-2035



IEA. CC BY 4.0.

Source: IEA (forthcoming), *World Energy Employment 2026*.

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Spotlight: Lessons on energy efficiency from past energy crises

The 2026 energy crisis has once again put energy security, affordability and resilience at the centre of policy discussions. The experience of previous energy crises offers four lessons that remain highly relevant today:

1. **Lasting efficiency gains come from structural policy changes, not temporary demand reductions.** Energy crises often reduce energy use as consumers respond to higher prices and supply constraints. However, the most enduring efficiency gains have generally come from policy action, including standards, regulations and efficiency programmes that continued delivering savings long after the crisis ended.

2. **Crises can accelerate permanent shifts between energy sources and technologies.** Besides having an impact on the efficiency improvement of existing technologies, periods of disruption paired with strong policy support and regulatory interventions can permanently change the fuels and technologies that societies rely on, accelerating the adoption of emerging solutions.

3. **Efficiency actions strengthen crisis resilience and shelter consumers from future crises.** Efficiency improvements reduce energy demand, lower fuel import requirements and limit exposure to future shocks. As a result, investments made years earlier can provide important benefits when the next crisis comes.

4. **Following a crisis, energy efficiency supports economic growth and improves living standards.** In many countries, energy crises accelerated efficiency improvements that reduced energy use and oil dependence without preventing economic development. Living standards continued to rise even as economies became less energy intensive.

On the following pages, a closer look at these lessons shows how policies, technologies and investment decisions shaped energy systems for decades and how those experiences can help inform responses to the 2026 crisis.

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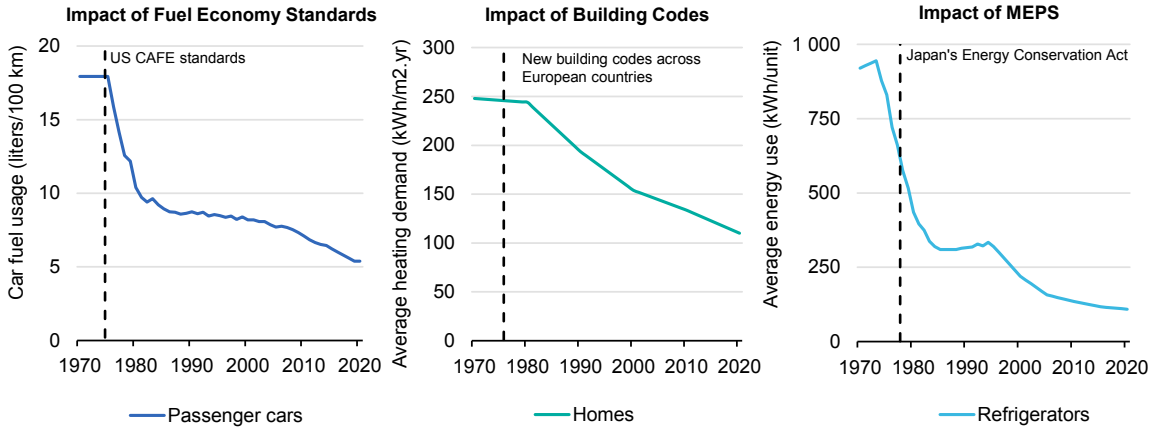
Lasting efficiency gains emerged from structural policy changes introduced after the 1970s oil shocks

Energy crises often trigger short-term reductions in energy use, but the most enduring efficiency gains have come from structural changes in their aftermath. In some countries, the oil shocks of the 1970s led to new policies and standards that continued improving efficiency long after energy markets stabilised.

In the United States, the 1973 oil shock prompted the introduction of Corporate Average Fuel Economy standards, requiring manufacturers to more than double the fuel efficiency of new cars from 1974 to 1985. By the 1980s, new light-duty vehicle energy use had fallen by around 40%. In Japan, the Energy Efficiency Act introduced minimum energy performance standards (MEPS) for refrigerators at a time when their energy use was rising rapidly. Manufacturers responded early to the forthcoming requirements, driving significant efficiency improvements.

European countries pursued parallel efforts in the built environment. In the years immediately following the 1973 oil shock, major European countries introduced their first legislative frameworks to improve the energy efficiency of new residential buildings. The energy intensity of new homes in these countries had fallen by more than 20% by 1990, compared to pre-crisis levels, and by 40% by 2000. These gains did not result from temporary conservation measures, but from sustained policy efforts to strengthen efficiency requirements over successive decades.

Energy efficiency of selected technologies and end uses after the 1970s oil shocks



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Notes: For cars, the curve represents fuel usage for new passenger cars sold in the United States. For homes, it shows the energy intensity of space and water heating for newly built residential units in selected major European countries (France, Italy, the Netherlands and Spain). For refrigerators, it reflects the energy use of an average 170-litre model in Japan.

Sources: IEA analysis based on US Environmental Protection Agency's *Automotive Trends Reports*; Eurac Research (2021), European Building Stock Analysis; Nakagami, H and B. Litt (1997), Appliance Standards in Japan, Energy and Buildings, Volume 26, Issue 1, 1997, pages 69-79.

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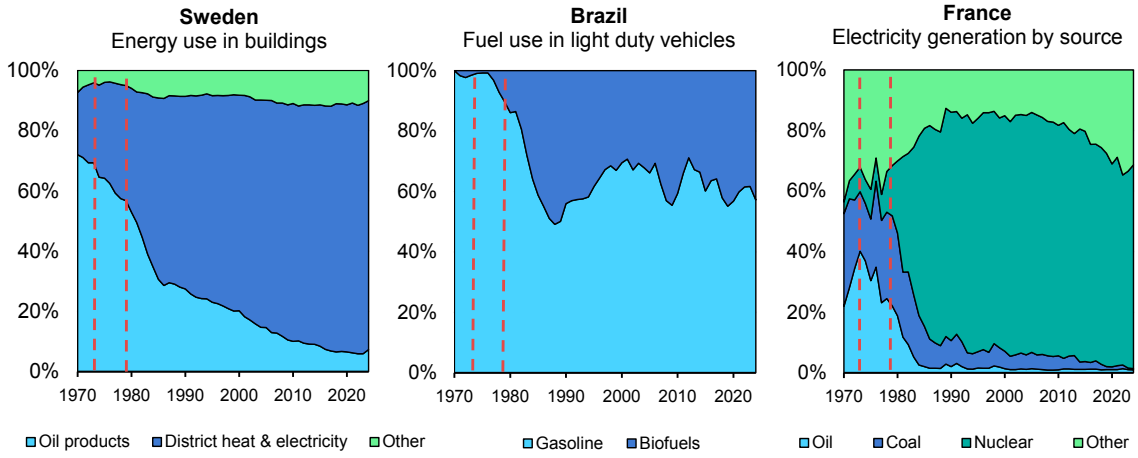
Energy crises can accelerate permanent shifts between energy sources…

Energy crises can permanently alter the fuels that countries rely on. Following the oil shocks of 1973 and 1979, many governments sought to reduce dependence on imported oil by expanding alternative energy sources and investing in different energy infrastructure. While the approaches varied across countries, the result was often a lasting shift away from oil that continued long after prices had stabilised. In France, for example, the sharp increase of oil prices following the oil shocks led to a large-scale nuclear expansion programme, helping reduce oil's share of electricity generation from 40% at its peak to around 1% within two decades.

Sweden provides the clearest example in the buildings sector, where the share of oil in residential energy use fell from over 70% in 1970 to below 10% in 2024. This shift gathered pace in 1974, when Sweden introduced grants and loans for energy conservation measures while expanding district heating networks. A similar shift occurred in Denmark, where stricter building energy regulations in 1977 and the Heat Supply Act in 1979 promoted the most socio-economically efficient forms of heating and accelerated the expansion of district heating.

In Brazil, a similar drive to enhance energy security following the oil shocks led to the launch of the Proálcool programme in 1975 and the subsequent support of ethanol-engined car sales in 1979. These policies substantially reshaped transport fuel use by promoting biofuel uptake in passenger cars and reducing gasoline's share of light-duty vehicles energy use to about half of its 1970 level.

Energy use by source for selected sectors, Sweden, Brazil and France, 1970-2025



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Note: Red dotted lines indicate the 1973 and 1979 oil crises.
Source: IEA analysis with data from World Energy Balances, (accessed 9 November 2026) and Swedish Energy Agency (2026), Database for Energy-Related Statistics, (accessed 9 November 2026).

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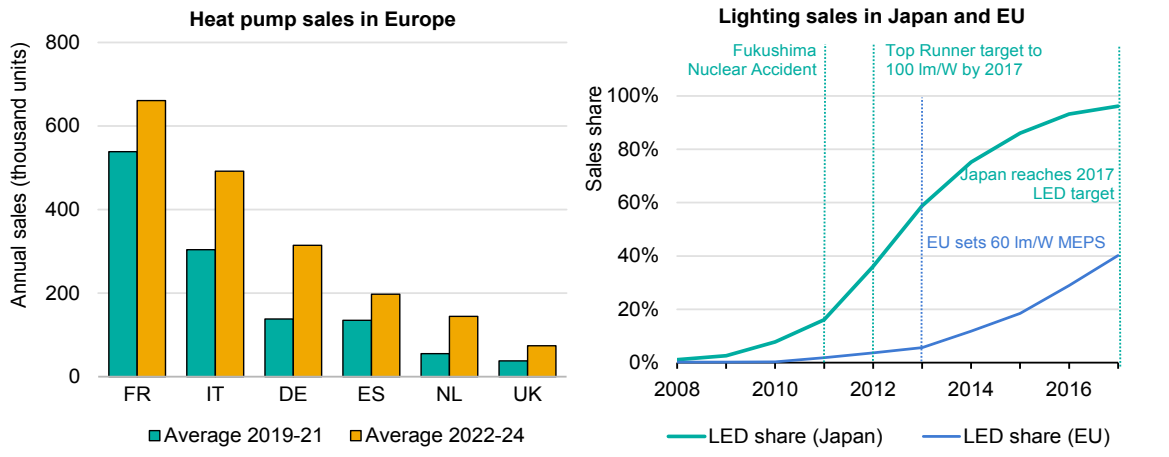
…and energy crises can accelerate shifts between technologies

Energy crises can accelerate the adoption of technologies and practices that fundamentally change how energy is used. While many of these solutions might exist before a crisis begins, disruptions can make them more attractive and hasten their uptake, particularly when supported by targeted policies.

Japan provides a clear example. After the Fukushima nuclear accident in 2011 and resulting electricity supply shortages, the government raised awareness of energy efficiency through its Setsuden (energy saving) campaign. Policies to promote LED lighting were in place before 2011, but adoption accelerated after the crisis, including setting the top runner target for at least 100 lumens per watt (lm/W; corresponding to 100% LED) to be reached by 2017. LED lighting accounted for less than 10% of total lighting sales in 2010, but increased to nearly 40% in 2012 and close to 100% in 2017. In comparison, in the European Union, LEDs accounted for only around 4% of sales in 2012, when Ecodesign requirements had phased out incandescent lamps but not yet restricted fluorescent lighting.

California's electricity crisis of 2000-01 accelerated the deployment of demand response programmes, advanced metering, and other demand-side solutions that became a feature of electricity system planning. More recently, the 2022 energy crisis, triggered by the Russian Federation's (hereafter, “Russia”) full-scale invasion of Ukraine, spurred record growth in heat pump sales and greater uptake of building renovations across Europe, supported by government measures. In each case, the crisis did not create new technologies, but accelerated the adoption of more efficient existing solutions.

Heat pump sales in Europe and lighting sales shares in Japan and the European Union



IEA. CC BY 4.0.

Notes: EU = European Union plus the United Kingdom.

Source: IEA analysis based on data from European Heat Pump Association (2026), Market data, (accessed 9 November 2026), Japan Lighting Manufacturers Association, Voluntary Statistics – Historical Data; European Commission (2019), Impact assessment SWD(2019)357.

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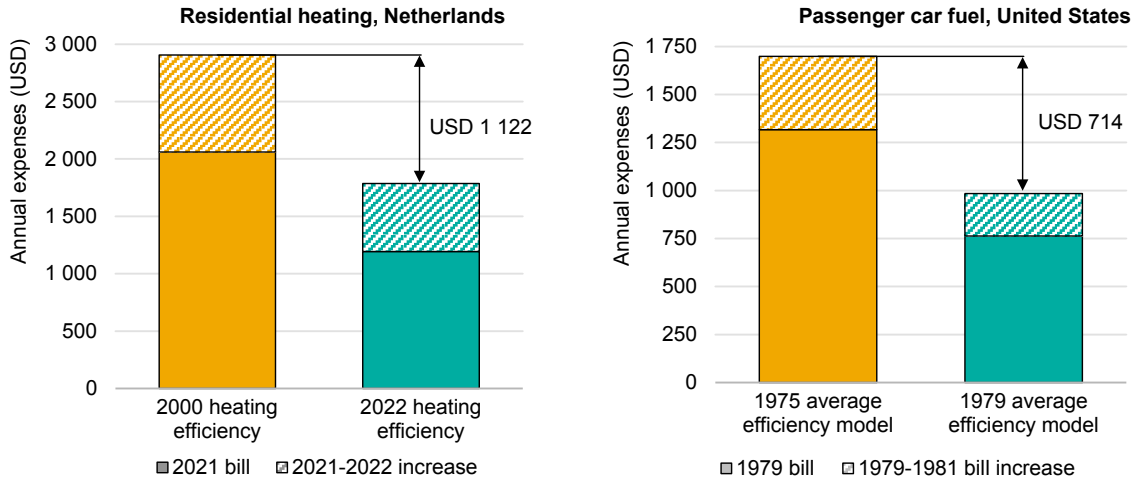
Efficiency has strengthened crisis resilience and sheltered consumers from past price shocks

Improvements in energy efficiency, driven by increasingly stringent regulations, have eased energy demand growth and reduced reliance on imported fuels, helping protect consumers from rising bills during periods of supply disruption and volatility. For instance, if residential buildings in the Netherlands had remained at 2000 efficiency levels, an average household would have spent over USD 1 000 more for heating during the 2022 energy crisis. Similarly, when fuel prices peaked in the United States in 1981, fuel efficiency standards introduced after the 1970s oil shocks helped shield owners of newer vehicles from higher fuel costs.

Today, governments are again implementing energy efficiency policies to shelter consumers from future crises and reduce energy security concerns. Countries of the Association of Southeast Asian Nations, which were among the most affected by the crisis in 2026, updated their shared Plan of Action for Energy Cooperation at the end of 2025 and reaffirmed a target to reduce energy intensity by 40% by 2030 relative to 2005 levels. Similarly, the European Commission's new Electrification Action Plan focuses on incentivising the uptake of more efficient electric technologies such as heat pumps, helping reduce exposure to fossil fuel price volatility.

Annual household heating bill for 2022, at different heating efficiency levels, Netherlands (left) and annual passenger car fuel bill for 1981, at different new vehicle fuel economy levels, United States (right)



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Notes: Household heating costs are calculated using Dutch average residential floor area and gas prices in 2021 and 2022 and heating consumption levels/m² in 2000 and 2021. Passenger car fuel bills are calculated using US gasoline prices in 1979 and 1981 and average new vehicle fuel economy levels in 1975 and 1979.

Sources: IEA analysis based on ODYSSEE-MURE (2026), Energy Efficiency Database, (accessed 9 November 2026);Eurostat (2026), Gas prices for household consumers - bi-annual data, (accessed 9 November 2026); US Energy Information Administration, Total Energy Database (accessed 9 November 2026); US Federal Highway Administration (1995), Highway Statistics Summary to 1995, (accessed 9 November 2026); US Environmental Protection Agency, *Automotive Trends Reports*.

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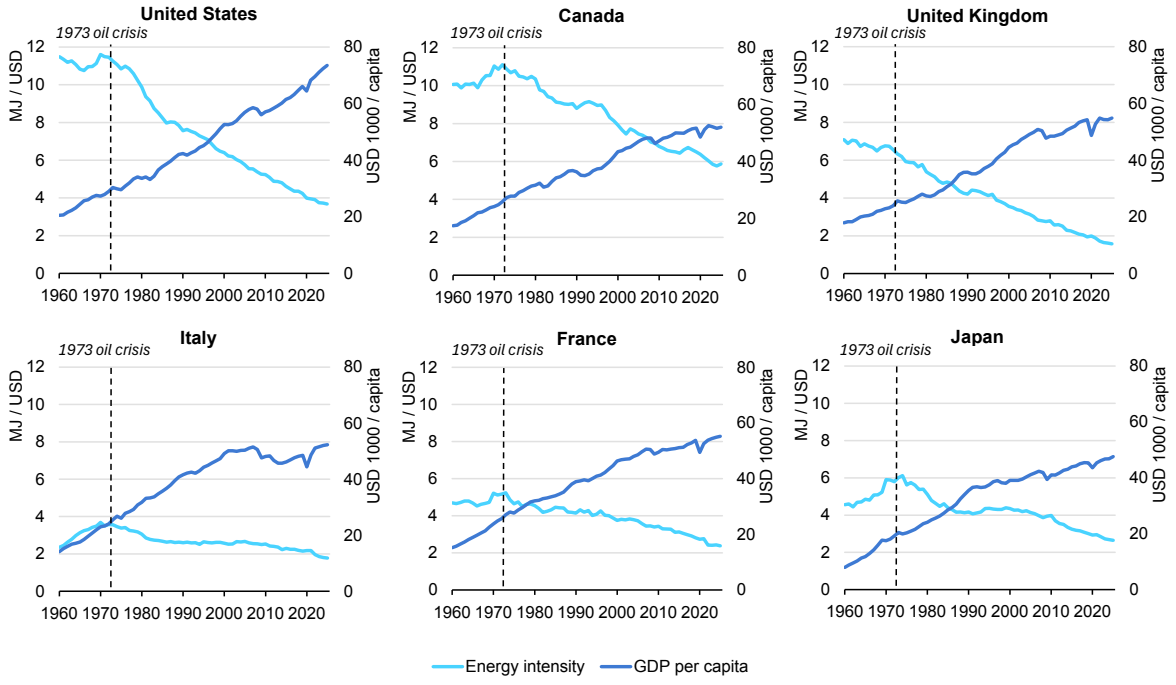
Over decades, energy intensity declined as economies continued to grow and living standards improved

The turning point for energy efficiency in the 1970s was followed by decades of rising living standards and economic growth in most countries, demonstrating that improvements in energy efficiency can accompany broader economic and social development. In the United States and Canada, for example, energy intensity had been stable or rising slightly prior to the oil shocks. From 1972, the year before the first oil shock, to 1990, energy intensity fell by 34% in the United States and 21% in Canada, while GDP per capita increased by more than 40% in both countries.

Similarly, in European economies such as France and Italy, the 1970s saw a shift from slight growth to a steady decline in energy intensity, which was already at a lower level than in North America. In both the United Kingdom and Japan, energy intensity declined at its fastest rate (36% in the United Kingdom and 28% in Japan) between 1972 and 1990, while both economies recorded their strongest period of economic growth in the previous five decades. In Japan, this meant that by 1990 the economy produced every dollar of GDP with nearly a third less energy, while GDP per capita was 85% higher. These examples show that substantial improvements in energy intensity occurred alongside sustained economic growth and rising living standards.

Primary energy intensity and GDP per capita, selected countries, 1960-2025



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Note: GDP = gross domestic product.
Source: IEA (2026) World Energy Balances, (accessed 9 November 2026).

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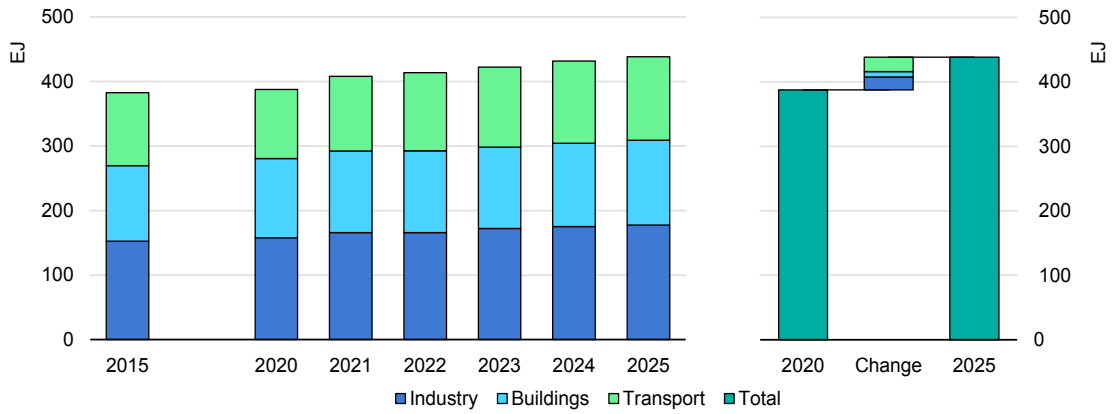
Chapter 2. End-use sectors

Global total final energy consumption continued to increase in 2025, reaching an all-time high of 467 EJ. Since 2020, energy consumption has grown by around 50 EJ, with transport accounting for nearly 45% of the growth, industry for almost 40%, and buildings for the remaining part. Industry remains the largest demand sector at 178 EJ, although its demand growth slowed to 1.4% in 2025, compared with an annual average of 1.9% since 2020. Buildings and transport account for similar shares of final energy demand. Transport demand growth also slowed in 2025, to 1.5%, compared with an average of 4.5% over 2021-2025 (excluding 2020), reflecting continued improvements in fuel efficiency, record EV shares in road transport vehicle sales and more moderate activity growth after the post-pandemic rebound. Buildings was the only sector where demand growth exceeded its 2020-2025 average, increasing by 1.7%, more than the average annual rate of 1.0%. This primarily reflects changing weather patterns, but also a lower overall average as a result of moderated demand growth in 2022 and 2023, when higher natural gas prices, particularly in Europe, accelerated the implementation of efficiency measures.

In 2026, some of these patterns are shifting, as growth is expected to flatten, with the transport sector likely slowing down further, as demand for gasoline, diesel and jet fuel are all expected to fall this year. Oil-intensive industries, particularly petrochemicals, are also expected to face weaker demand growth or a drop, due to higher prices and feedstock supply constraints.

Annual global total final energy demand by sector, 2015-2025



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Notes: Total final consumption is only shown for the buildings, industry and transport sectors. The remainder, from agriculture, fishing and other non-energy uses, excluding petrochemical feedstocks, accounts for 28 EJ in 2025.
Sources: IEA (2026), World Energy Outlook and World Energy Balances, (accessed 9 November 2026).

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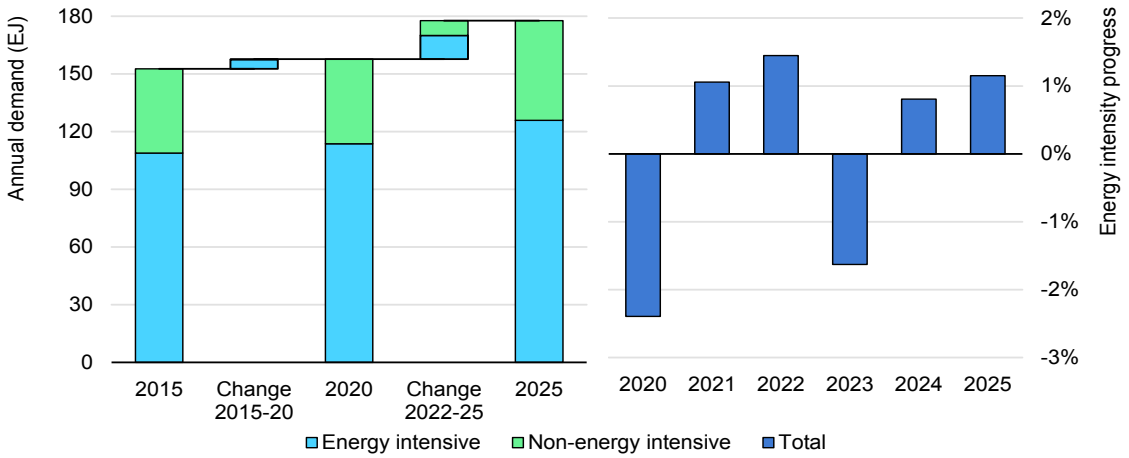
2.1 Industry

Rising industrial activity continues to outweigh efficiency improvements

Industrial energy demand increased by roughly 1.6% per year over the past decade, with growth across most sectors outpacing gains from material and energy efficiency. Industry now accounts for nearly 40% of final energy consumption. Most growth in recent years has been concentrated in emerging market and developing economies (EMDEs), where industrial energy demand increased by 2.2% per year on average, with China and India accounting for the largest share of the overall increase. Since 2020, non-energy-intensive sectors have emerged as an important driver, accounting for 40% of demand growth.

Despite evidence that most organisations (98%) are already investing in energy efficiency or planning to, the gap between industrial growth and efficiency improvements has widened in recent years. After averaging around 2% per year over 2010-2019, improvements in energy intensity slowed to almost zero over 2019-2025. Existing policy measures are expected to support gradual progress over the next decade, but current rates of improvement remain below those achieved before 2020. Recent policy frameworks, such as China's National Development and Reform Commission's (NDRC) energy-saving and carbon-reductions plan, Viet Nam's Amended Law on Energy Efficiency and Conservation and the EU Industry Accelerator Act, seek to improve industrial efficiency through energy intensity targets, minimum energy performance standards (MEPS) and related measures.

Global industrial energy demand and energy intensity progress, 2015-2025



IEA. CC BY 4.0.

Note: Energy intensity is calculated as energy consumption over value added in the sector. Positive energy intensity progress represents a reduction in energy intensity.
Source: IEA (2026), World Energy Outlook.

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Asian economies accelerated industrial efficiency policies in response to the 2026 global energy crisis

Globally, the industrial sector faced growing energy security challenges in 2026 as fuel and feedstock supply chains came under pressure. Rising energy costs, supply uncertainty and concerns over energy security increased pressure on industrial operations, particularly in Asia, which was one of the hardest hit by the supply disruption.

The impacts were felt across industry, particularly in energy-intensive and oil-dependent sectors such as chemicals and petrochemicals, and among small and medium-sized enterprises (SMEs), which are often highly exposed to energy price volatility. India, for example, imports around 60% of its liquefied petroleum gas (LPG), with approximately 90% of these imports passing through the Strait of Hormuz. The closure of this critical trade route led to fuel shortages, increased energy costs and disruptions to industrial supply chains. SMEs, which account for more than one-quarter of India's industrial energy consumption and over a third of the country's manufacturing output, were especially exposed. Sectors such as textiles, food processing, ceramics and glassmaking faced rising costs and operational constraints. Similar challenges emerged in Thailand, where SMEs faced liquidity pressures and the petrochemical sector experienced feedstock shortages, raising concerns about industrial output and competitiveness.

These heightened energy security concerns and disruptions in global energy markets prompted governments to strengthen energy efficiency, demand-side and energy transition measures for industry and businesses, while also providing targeted support to address near-term energy cost pressures and improve long-term energy security for these sectors. In 2026, Viet Nam issued new directives that strengthened electricity-saving requirements, expanded demand-side management and demand-response programmes, and reinforced requirements for energy audits and energy management systems among major energy users, including industrial facilities. These measures were explicitly framed as contributing to national energy security. Thailand implemented financial support for businesses, including concessional loans for energy-efficient and clean-energy investments, while the Lao People's Democratic Republic announced plans to encourage fuel conservation across society and sectors and promote renewable energy use among businesses and farmers. Singapore responded to the crisis with a number of support packages for businesses, including an expansion of the energy efficiency grants programme to all sectors until 2028. Japan responded to the crisis by expanding industrial energy efficiency policies, while the Netherlands combined enhanced energy efficiency measures for businesses and industry with targeted energy price relief programmes.

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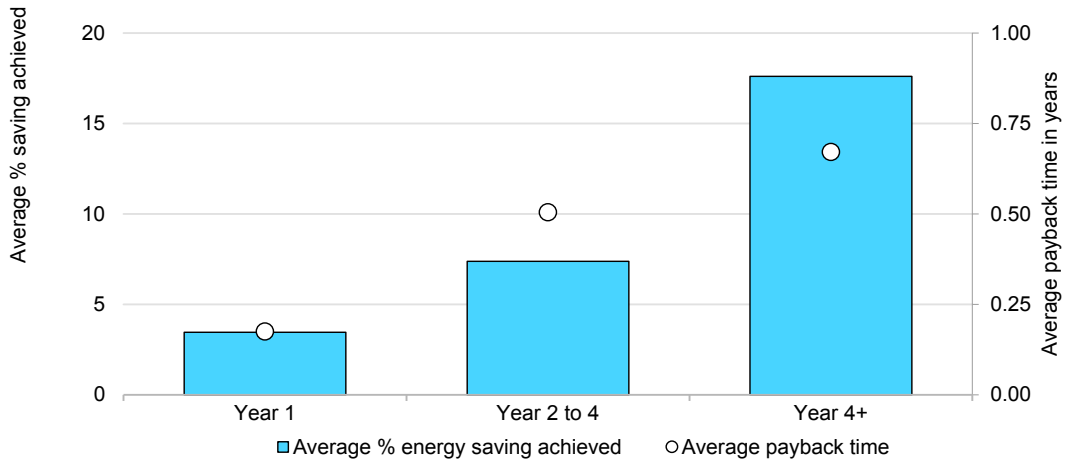
Efficiency could help the petrochemical sector weather the energy crisis, but implementation remains uneven

The chemical and petrochemical sector, accounting for around 30% of global industrial energy use, is highly dependent on fossil fuels, particularly oil, for both process energy and feedstocks. Around 60% of energy demand is feedstocks, with process energy accounting for the remaining 40%. Petrochemical producers are particularly price-sensitive industrial consumers of oil. In the early stages of the current crisis, feedstocks used in the sector were the industrial product group most responsive to price and market signals, and they are projected to account for a significant share of the decline in oil demand in 2026.

Improving efficiency in both process energy use and feedstock consumption can reduce costs while strengthening the sector's long-term resilience. Material efficiency, increased recycling and alternative feedstocks can curb demand for oil-based feedstocks, although such measures often take time to scale up. Process efficiency can deliver benefits more quickly. IEA analysis of 31 companies indicates that proven technologies can cut process energy use by around 8% on average and up to 30% in some cases, with payback periods below one year.

Most of the major oil-based petrochemical-producing countries have policies that mandate large energy users to implement energy management activities and/or systems. However, implementation within the sector remains uneven. In the United States, only 20% of petrochemical companies surveyed in 2022 had energy sub-metering, and less than 50% had implemented energy management activities, indicating substantial scope for further energy efficiency gains.

Average savings and payback times for 31 chemical and petrochemical companies introducing Energy Management Systems, 2016-2024



IEA. CC BY 4.0.

Source: IEA analysis based on Clean Energy Ministerial (2024), Energy Management Leadership Awards.

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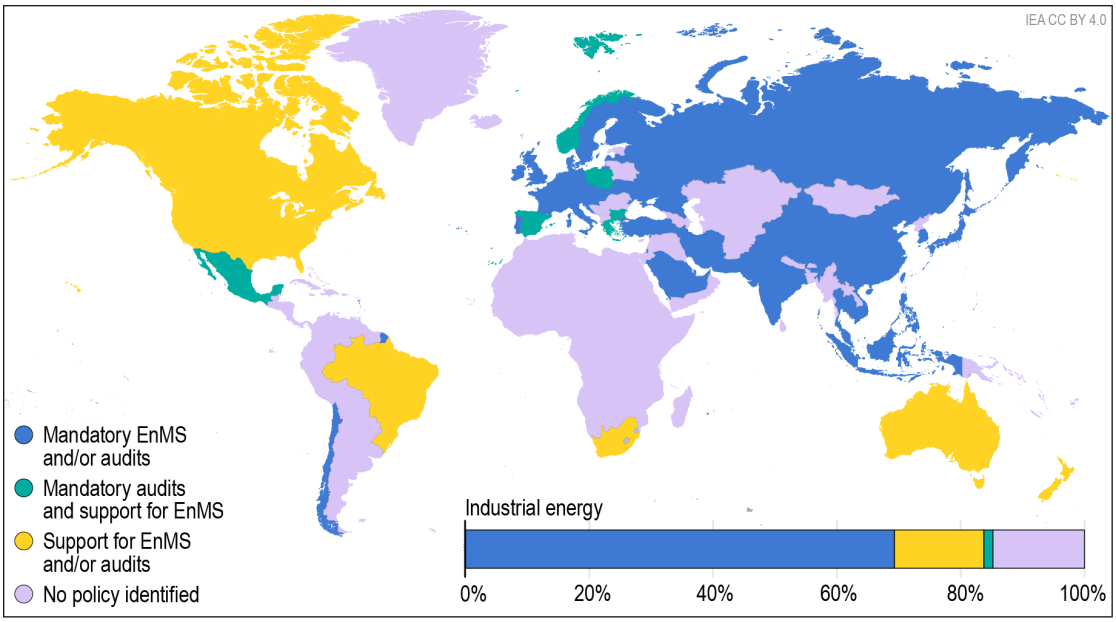
Countries representing 85% of industrial energy demand now have energy management policies

Addressing barriers to energy efficiency requires targeted policy support. To help overcome these challenges and unlock cost-effective savings, governments are increasingly adopting policies that promote energy audits and energy management systems (EnMS). New IEA tracking shows that countries representing around 85% of global industrial energy demand have implemented policies that mandate or support energy audits and energy management systems.

Many countries require large energy users to implement energy management systems. The revised EU Energy Efficiency Directive expands mandatory coverage based on enterprises' average annual energy demand over the previous three years. Those exceeding 10 terajoules (TJ) that do not operate an EnMS must complete a first energy audit by 11 October 2026, while those exceeding 85 TJ must have a certified EnMS in place by 11 October 2027. In Viet Nam, legislation introduced in 2026 strengthened monitoring and reporting requirements, complementing existing obligations for energy users consuming more than 42 TJ to implement energy management systems.

Financial and technical support programmes are also driving adoption. In Brazil, the Procel programme combines energy audit support with access to financing. Several countries are also strengthening accreditation frameworks for energy managers and auditors. Indonesia (2025) and Malaysia (2024) introduced certification systems to build technical capacity and support effective energy management. In 2025, Türkiye expanded access to its Efficiency Improving Projects funding programme by removing an energy use eligibility threshold.

Countries with different types of energy management system requirements, 2026



Notes: EnMS= energy management system. In federal countries, policies may not apply in all jurisdictions.

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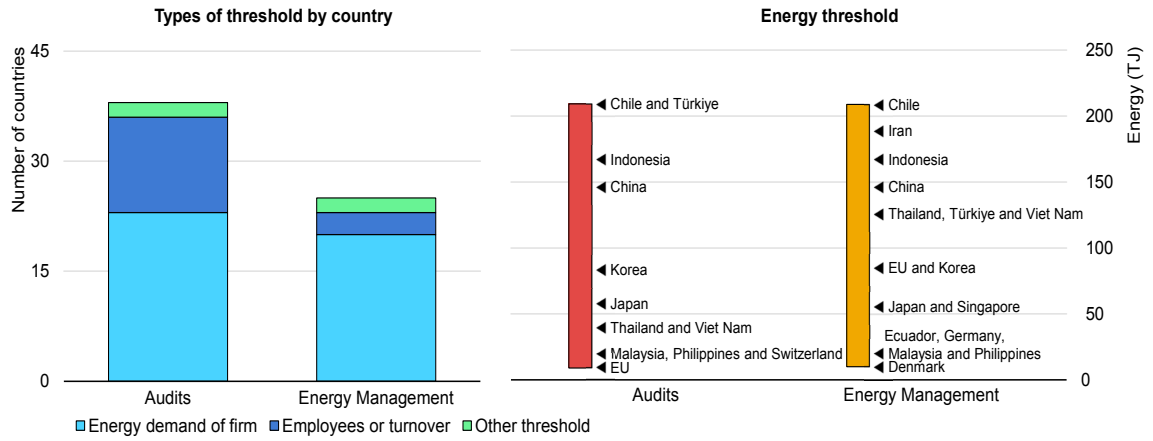
New energy management thresholds broaden industrial coverage in 2026

2026 marked a major implementation milestone for industrial energy management policies, as many previously announced energy consumption thresholds came into force. Across jurisdictions, regulatory requirements increasingly shifted from enterprise size to energy use, bringing more industrial energy under energy management requirements regardless of company size.

EU member states began implementing the recast Energy Efficiency Directive, which sets more stringent thresholds of 10 TJ for mandatory energy audits and 85 TJ for EnMSs, replacing the previous lower thresholds. Similar approaches were adopted in Finland and France, while Germany proposed a comparable framework. Beyond Europe, Kenya and Malaysia expanded coverage through energy-based requirements, while China lowered the threshold for mandatory energy conservation and carbon reduction management from 293 TJ to 147 TJ, substantially increasing regulatory coverage. Viet Nam's new Energy Efficiency Law streamlined existing energy efficiency policies under a single framework, including a threshold for industry consuming over 42 TJ annually.

At higher levels of energy use, requirements increasingly extend beyond audits to include certified EnMSs, action plans, reporting and verification. In some jurisdictions, frameworks are evolving into broader performance-based systems. India, for example, is replacing its Perform, Achieve and Trade programme with a new Carbon Credit Trading Scheme that links compliance to emissions intensity targets and carbon credit trading.

Active thresholds for industrial audits and energy management systems by type of threshold and the energy threshold used, by country and continent, 2026



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Notes: Lower thresholds cover a larger number of facilities. Energy thresholds for the European Union indicate the new Energy Efficiency Directive threshold. Specific EU countries shown in the figure have implemented more stringent thresholds. Some countries, such as India, have thresholds for major industrial sub-sectors and so are not shown.

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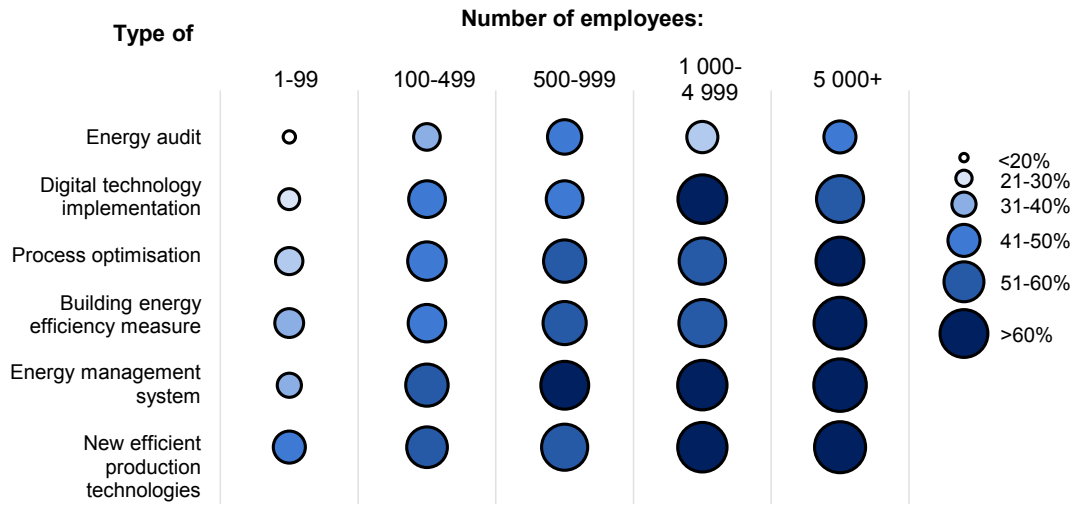
Most industrial efficiency policies still focus on large companies

Small and medium-sized enterprises account for more than 90% of businesses worldwide and over 60% of global employment. Yet only 9 of the 85 governments that introduced new energy efficiency policies in 2025 and 2026 included measures specifically targeting SMEs. This comes despite evidence that SMEs often face higher energy prices, spend a larger share of revenue on energy, and have fewer resources to manage price volatility than larger companies.

SMEs are proving particularly vulnerable during the current energy crisis. In Singapore, SMEs reported greater impacts than larger firms from rising energy and logistics costs. Three-quarters of firms surveyed in the United Kingdom anticipate higher energy bills, while more than one-third expect difficulty paying them. A survey of nearly 2 500 SMEs in Japan found that 70-80% were affected by rising prices, and more than 90% reported impacts on their business operations.

There is considerable scope to improve SME resilience through improved energy efficiency. Within the same industrial sub-sector and at comparable sales levels, the least energy-efficient SMEs can face energy costs up to six times higher per unit sold than the most efficient. Across the SME sector, energy savings of around 30% could be achieved through proven technologies and practices, with relatively short payback times. Yet adoption remains limited. Results from the 2025 IEA Industrial Competitiveness Survey, which covered 1 000 companies across 14 countries, show that SMEs are much less likely to implement energy management systems, limiting their ability to identify savings opportunities.

Share of surveyed companies implementing energy efficiency actions by size, 2025



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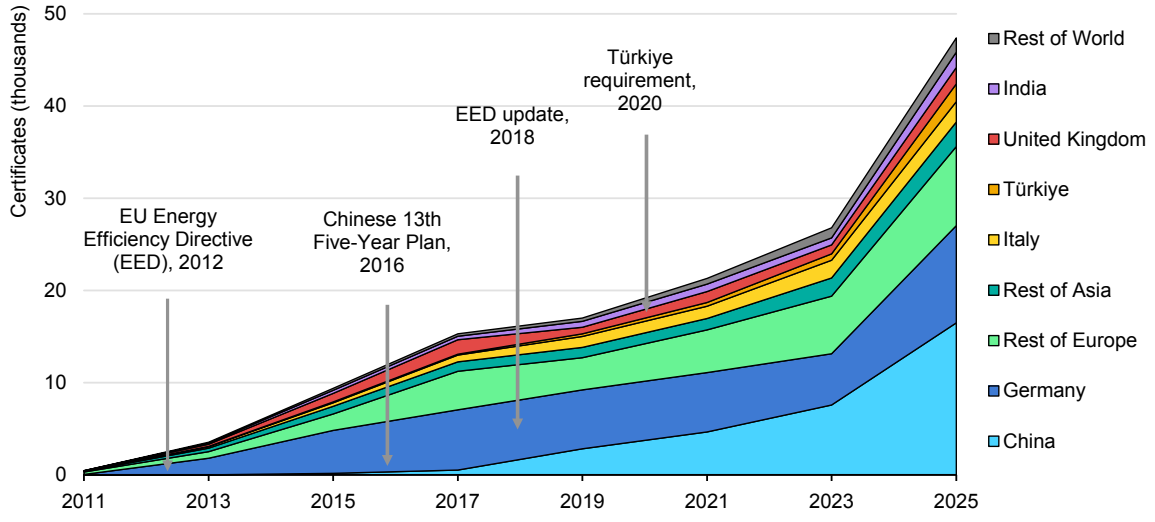
Governments are increasingly using ISO 50001 to strengthen energy management

The ISO 50001 international energy management standard provides a framework for organisations to systematically improve energy performance through monitoring, management and continuous improvement. The number of ISO 50001 certifications has grown by around five times in the past decade, reflecting growing recognition of the role of energy management in reducing costs, improving competitiveness and strengthening resilience.

ISO 50001 is increasingly being used as the basis for mandatory energy management. In many European countries, certification to ISO 50001 is recognised as a means of complying with energy management obligations. Several countries, such as Ecuador, Türkiye and, most recently in 2026, Mexico, have gone further by requiring large energy users to implement ISO 50001 or nationally-derived equivalents, contributing to a rapid increase in certifications. Since 2020, the number of certificates in Türkiye has increased by a factor of six.

In 2026, the introduction of a new standard, ISO 50010, expanded the role of energy management in industrial decarbonisation. The standard provides a framework for reducing energy-related greenhouse gas emissions through energy efficiency and conservation, while also incorporating measures such as demand flexibility, energy recovery, low-emission energy sources, and carbon capture and storage to support integrated decarbonisation strategies.

Number of ISO 50001 certifications by country or region, 2011-2025



IEA. CC BY 4.0.

Note: From the 2024 reporting cycle, ISO certification data began to be compiled directly from the IAF CertSearch database, expanding reporting coverage and improving consistency.
Sources: IEA analysis based on International Accreditation Forum (2026), ISO Survey.

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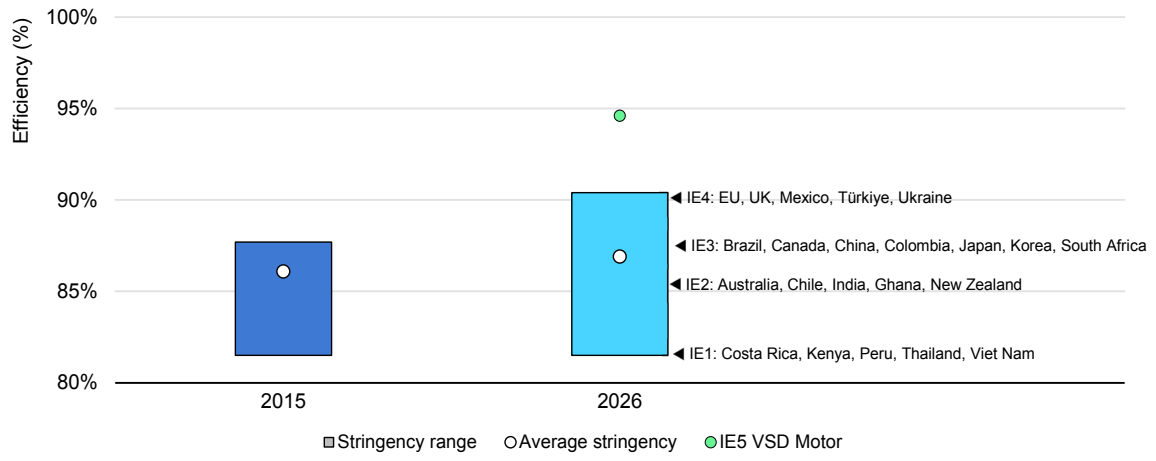
Efficiency standards for industrial equipment, such as motors, fans and refrigeration are expanding globally

Industrial equipment is a major source of energy consumption. Minimum energy performance standards are increasingly used to phase out inefficient equipment, delivering energy and cost savings over the equipment's lifetime.

More than 80 countries have now implemented MEPS for electric motors, putting them among the most widely adopted industrial efficiency policies globally. In 2026, governments continued to strengthen industrial equipment policies through updated MEPS, testing standards, labelling requirements and refrigerant-related measures. Key developments included new EU Ecodesign requirements for industrial fans, proposed efficiency updates in Canada for compressors and commercial heating, ventilation and air conditioning, and revised standards in Mexico for commercial refrigeration and air conditioning.

Adopted motor efficiency requirements range from IE1 (standard efficiency) to IE4 (super premium efficiency). Opting for the highest-efficiency motors can halve the operational losses, providing significant savings through their long lifetime. Variable speed drives can deliver additional savings of up to 50% in part-load applications such as pumps and compressors. In 2026, the trans-Tasman Energy and Climate Change Ministerial Council of Australia and New Zealand agreed to expand coverage to a wider range of motors and progressively tighten requirements from IE2 and IE3 to IE4, while Thailand made motor standards mandatory.

Minimum energy performance standards for industrial electric motors, policy stringency, global country range, 2015 and 2026



IEA. CC BY 4.0.

Notes: Stringency levels refer to the highest stringency when the policy differentiates between equipment classes (e.g. capacity). An efficiency of 100% would transform electricity into kinetic energy without losses. VSD = variable speed drive. IE1 = standard efficiency. IE2 = high efficiency. IE3 = premium efficiency. IE4 = super premium efficiency. IE5 = ultra premium efficiency. Country sample represents 79% of global total final energy consumption.

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Industrial efficiency delivers benefits beyond lower energy bills

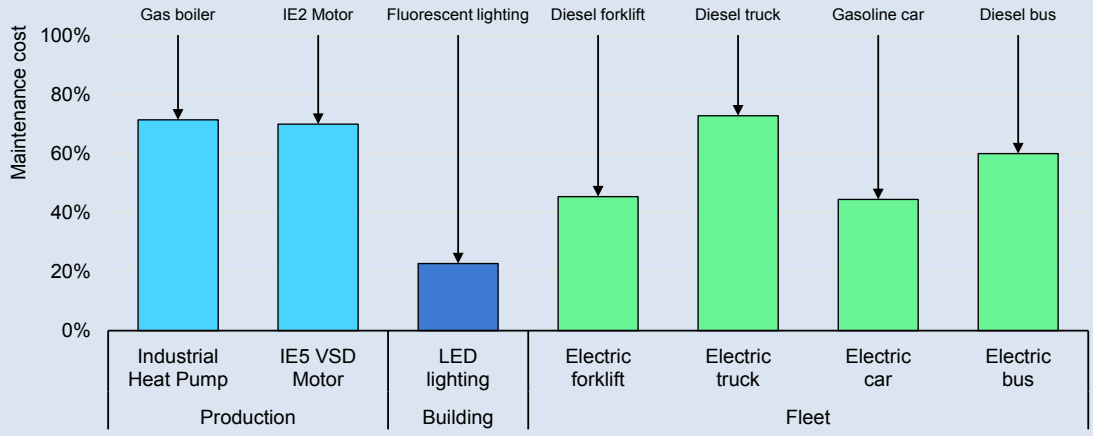
The value of industrial energy efficiency extends far beyond lower energy bills. While reduced energy costs can improve margins and reduce exposure to price volatility, efficiency investments often deliver multiple benefits that can strengthen competitiveness.

Operationally, energy efficiency can improve productivity, reduce maintenance costs and lower the need for input materials, water use or waste management. Efficient and electrified equipment often operates more reliably and with less stress, leading to higher stability and reduced downtime. As a result, for every dollar saved on energy, up to an additional 30 cents of value can be realised through these wider benefits.

Energy efficiency can also improve product quality and process performance. In a recent IEA survey, 75% of companies reported reductions in production defects following energy efficiency improvements. Measures often provide better process control and more consistent output. Improved sustainability performance can also strengthen brand image, with more than half of consumers reporting a willingness to pay a premium for more sustainable products.

Finally, energy efficiency improvements can help to reduce pollution and improve workplace conditions, enhancing worker health and wellbeing. Accidents and sickness can be reduced, while worker productivity increases with improved thermal comfort or air quality. Reduction in sick leave days and worker productivity improvements can add up to eight additional productive days per employee each year. Capturing these benefits systematically in investment decisions is crucial to accurately reflect the value of energy efficiency.

Maintenance cost difference between efficient and inefficient technologies



IEA. CC BY 4.0.

Notes: VSD = variable speed drive. IE2 = high efficiency. IE5 = ultra premium efficiency.
Source: IEA (2026), Multiple Benefits of Energy Efficiency for Business.

IEA. CC BY 4.0.

2.2 Buildings

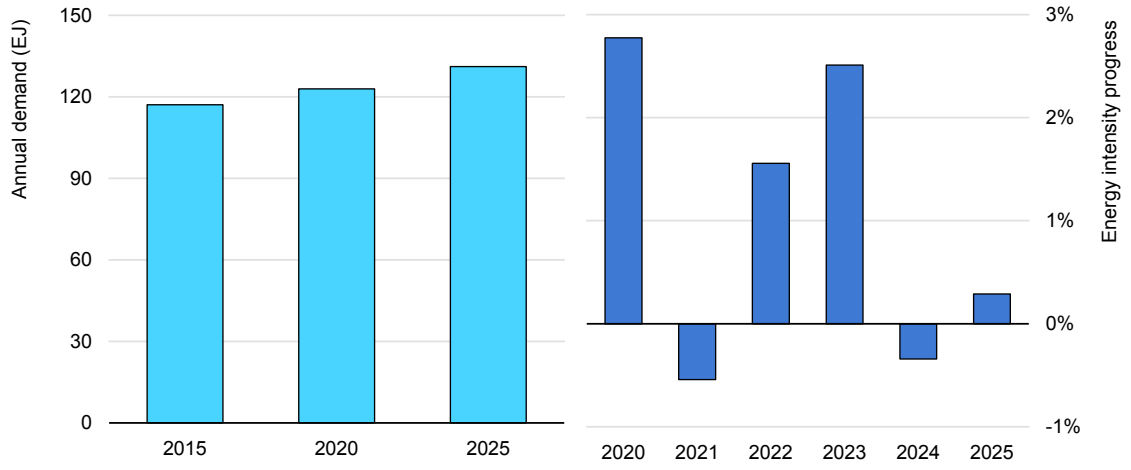
Buildings energy intensity sees improvement in 2025, but new proposed target would require faster progress

Energy consumption in the buildings sector has grown at an average annual rate of 1.1% since 2015, to over 130 EJ in 2025. Buildings account for half of electricity consumption and around 30% of total final consumption. The residential sector makes up 70% of that demand, with commercial and public buildings contributing the rest.

Global buildings energy intensity (expressed as the amount of energy consumed per unit of floor area) improved at less than 2% per year between 2010 and 2019 and improvement has averaged only around 1% annually so far this decade. As a result, since 2020, energy intensity has only improved by around 3%, while energy demand increased by around 7%, as expanding floor area and rising demand for energy services such as cooling have outweighed efficiency gains.

In 2026, the COP31 Presidency proposed a global goal to improve buildings energy intensity by at least 25% by 2035. IEA analysis shows that, in a scenario based on today's policy settings, buildings energy intensity is set to improve by about 7% by 2035. Closing the remaining gap will require faster progress in both new and existing buildings, including through stronger building codes, higher renovation rates, wider adoption of heat pumps, improvements in the efficiency of appliances such as air conditioners and increased access to clean cooking.

Buildings energy demand and energy intensity progress, 2015-2025



IEA. CC BY 4.0.

Notes: Energy intensity is calculated as energy over floor area. Energy intensity progress reflects a reduction in intensity.
Source: IEA (2026), World Energy Outlook.

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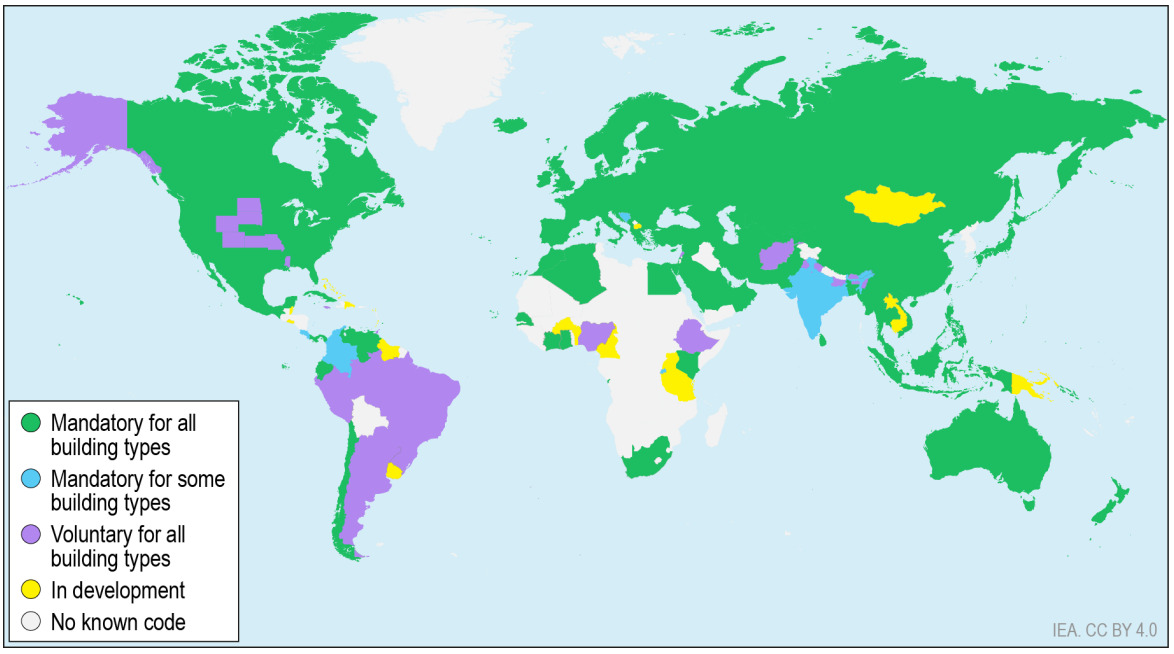
Building energy code coverage continues increasing, but enforcement remains a challenge

As of mid-2026, mandatory building energy codes or standards are in place in 101 countries for non-residential buildings and in 97 countries for residential buildings. Around 60% of new buildings constructed each year are covered by an energy code. While an increasing share of buildings is being built in countries with regulatory frameworks, these often apply only to certain building types or lack enforcement, highlighting considerable opportunities to strengthen and expand regulatory coverage around the world.

In 2025 and 2026, seven governments introduced or strengthened building energy codes. Oman began a voluntary pilot of its first Energy Efficiency and Sustainability Code before a mandatory rollout in 2030. Kenya introduced new requirements for solar water heating in buildings. Australia's 2025 National Construction Code introduced requirements to facilitate renewable energy, energy storage and EV charging in commercial buildings, while California's 2025 Title 24 update, effective from 2026, requires heat pumps in all new residential buildings and expands solar PV and battery storage requirements. Canada's 2025 National Model Codes included a new harmonised framework that aims to reduce the operational greenhouse gas emissions of houses and buildings.

Global status of building energy codes in 2026



Notes: The map tracks known national building energy codes and those where a national mandate for adoption exists. In cases where the national mandate exists, the map shows its status and not adoption at the subnational level (e.g. Brazil, India and Mexico). In cases where building energy codes are not mandatory at the national level, the map shows implementation at the subnational level jurisdictions (e.g. Belgium, Canada and the United States).

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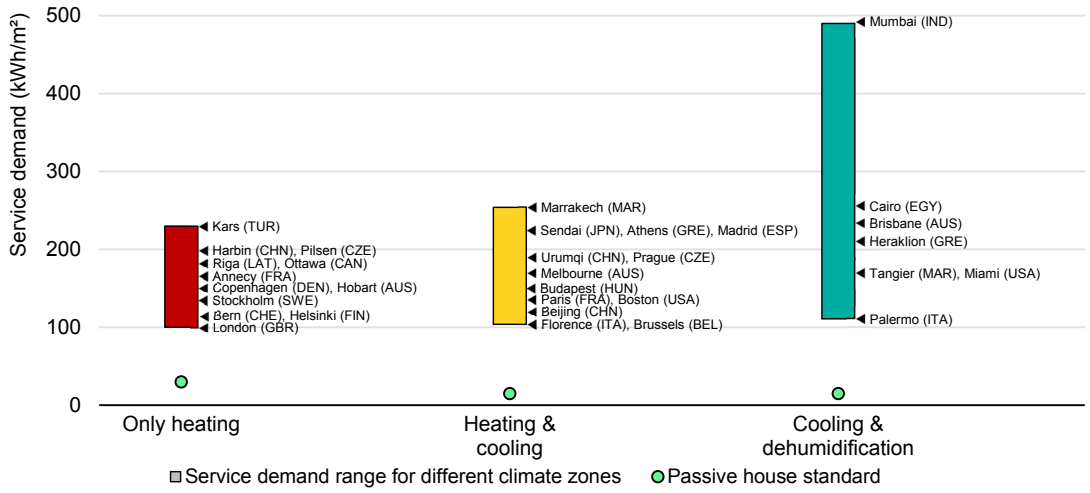
Building energy demand for similar climate zones varies widely under different codes

The energy needed to ensure a comfortable indoor temperature depends on the local climate and building characteristics, including orientation, ventilation and envelope performance. Building energy codes therefore strongly influence heating and cooling service demand through their minimum requirements for envelope components such as walls, roofs, floors and glazing.

IEA analysis shows that different levels of regulatory stringency can cause wide variation in estimated energy service demand (the energy required to maintain an indoor temperature of 21°C). Some countries with stringent codes may use less than half as much energy as others with weaker codes. In heating-dominated climates, Finland, Switzerland and the United Kingdom have some of the most stringent requirements. Among cities for which the need for cooling and dehumidification is dominant, service demand is lowest in Italy, Morocco and the United States. Improved building codes could be especially valuable in countries with high cooling needs and rapidly growing air conditioner ownership, helping moderate electricity demand growth.

Across all climate zones, compliant buildings have notably higher energy service demand than that of a passive house standard, known for very high requirements for building envelopes in line with the zero-carbon-ready building level of performance.

Estimated service demand for buildings compliant with building energy code requirements in selected countries to achieve optimal comfort, by climate zone



IEA. CC BY 4.0.

Notes: Service demand is the energy required to maintain an indoor temperature of 21°C, accounting for heating and cooling needs under local climatic conditions. It may differ from the actual final energy demand in buildings in each specific country. The calculations use data for U-values for external walls, roofs, floors and glazing, a fixed ventilation level and solar gains to estimate service demand of a hypothetical building with the same design and building geometry characteristics fixed across all countries and climate zones (a two-storey residential house with a floor area of 140 m^2).

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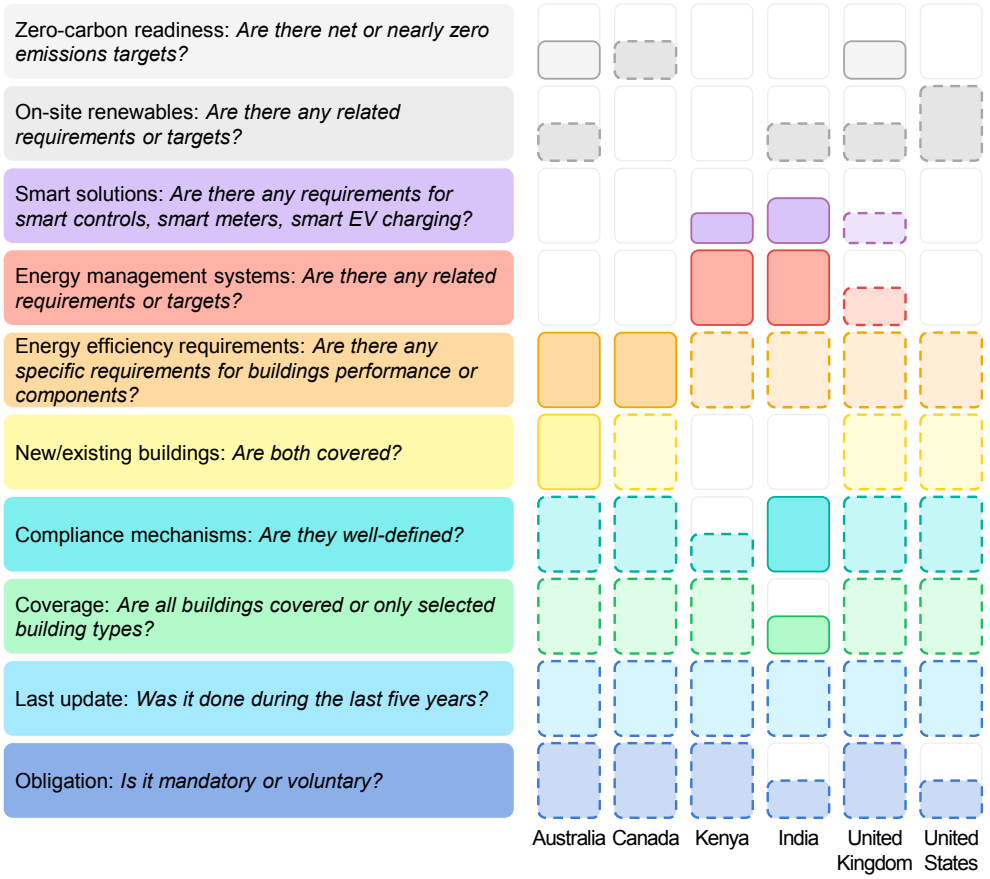
Recent building code updates focus on smart solutions and zero-carbon readiness

An analysis of countries that updated their building codes in 2025 and 2026 reveals an increasing focus on the most advanced elements of building regulation. In Australia, Canada, the United Kingdom and the United States, recent revisions strengthened provisions related to smart controls, on-site renewables and zero-carbon readiness, extending already mature frameworks further into decarbonisation territory.

The IEA Building Energy Code Content Assessment, which evaluates building energy regulations across ten core components, shows that many recent updates are concentrated in these advanced areas.

Meanwhile, India saw a broader overhaul of its building regulation, including on foundational code requirements. After revising its building energy codes in 2024, its focus in 2025 and 2026 shifted towards implementation, with progress in state-level adoption, incorporation into building by-laws and strengthened compliance mechanisms.

New elements in residential building energy codes, by country, 2026



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Notes: For each category scores are assigned as 0 (not addressed), 0.2 (individual requirement), 0.5 (partially addressed) or 1 (fully addressed). The height of the bars represents the score for that category. Existing provisions are shown in hatching, and recent updates in codes are shown in solid colours.

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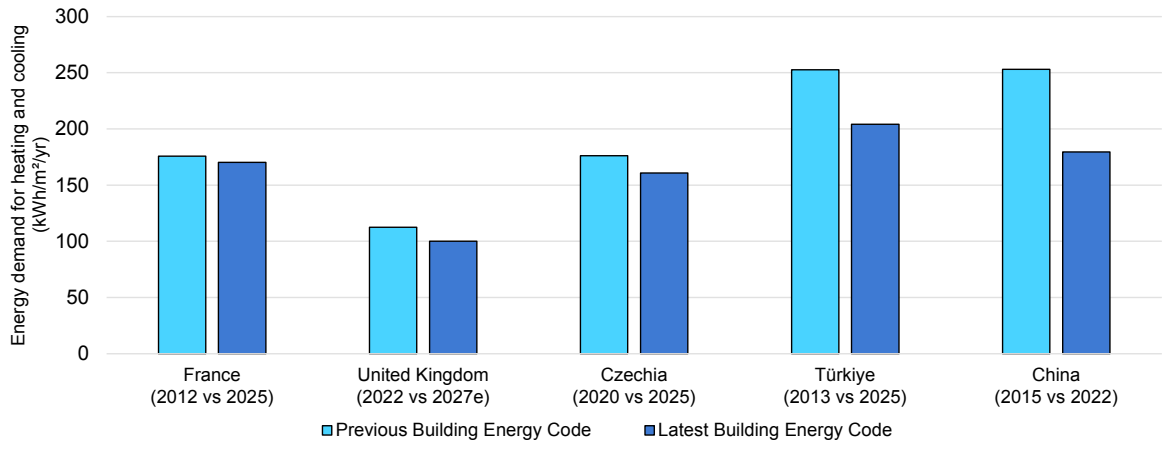
Recently updated building standards set to improve new buildings' energy efficiency by up to 30%

More than 40 countries have updated or adopted building energy codes since 2021. Recent revisions increasingly target not only the building envelope and system performance, but also building operations, thermal comfort, whole-life carbon and climate resilience.

Dampening the effects of energy price volatility, recent code updates continue to reduce heating and cooling demand, while newer revisions increasingly focus on building operations and carbon performance. For housing being constructed today, Türkiye's 2024 update is estimated to cut energy demand by 20% through nationwide implementation of Nearly Zero Energy Building standards, while China's 2021 revision is estimated to reduce energy demand by 30% through improvements in envelope performance and building operations management. Czechia's 2025 code update is estimated to reduce energy demand by 9%. The coming code update in the United Kingdom strengthens insulation requirements for roofs, walls and floors and is expected to achieve energy savings of around 11% compared with the previous code.

Some updates focus on improving building operations, ventilation and low-carbon fuel carriers' options. Canada's 2025 National Energy Code for Buildings introduced enhanced airtightness requirements, climate zone adjustments for fabric heat loss and performance-based compliance pathways. Denmark's recently updated code strengthens airtightness, summer comfort, building-integrated renewables and the integration of building services with heat planning.

Delivered space heating energy demand in representative dwellings for countries with recently updated codes



IEA. CC BY 4.0.

Notes: Energy demand for heating and cooling includes the efficiency of the heating or cooling system for a typical 120 m^2 house using the current and previous standard requirements. The United Kingdom is expected to enforce its updated code in 2027.

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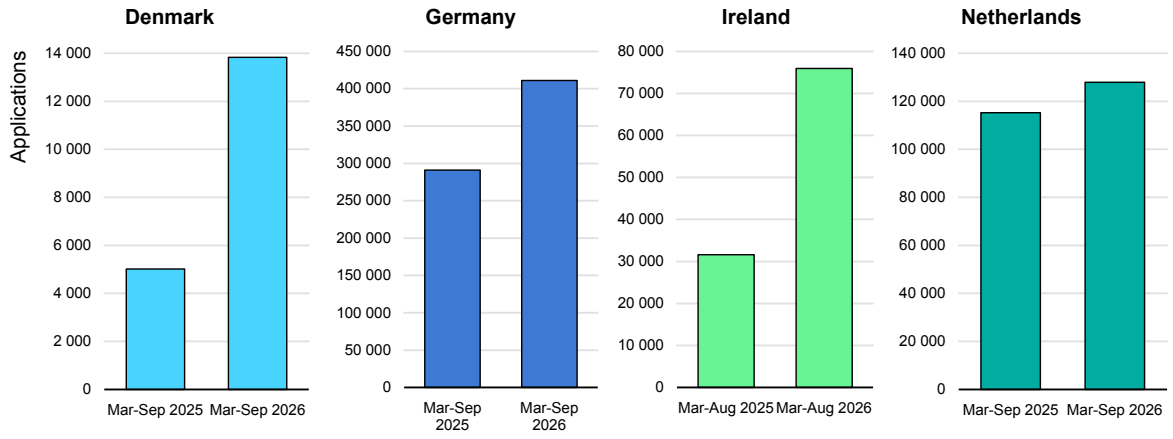
Several countries see an uptick in retrofit applications in 2026 amid energy crisis

Preliminary data for 2026 suggest that in some countries, rising energy costs and concerns over energy security have renewed interest in building renovations, particularly where supportive policy frameworks are already in place. Examples include the United Kingdom's Warm Homes Plan, which supports insulation, electrification and solar PV installation, Canada's announcement of an investment plan with a budget of around USD 1.4 billion that includes financing for apartment retrofits and heat pump rebates, and additional energy audits for public buildings in the Philippines.

Data from selected countries also indicate rising demand for retrofit support. In Denmark, heat pump subsidy applications between March and September 2026 were nearly three times as high as in the same period of 2025, despite the programme closing in June. Applications for grants supporting building envelope and heating system upgrades in Germany increased by 41% year-on-year between March and September 2026, following a 47% increase the previous year, pointing to a longer-term trend. In contrast, Home Energy Upgrades grant applications more than doubled in Ireland between March and August 2026 after remaining flat for two years. In the Netherlands, household applications under the Sustainable Energy Investment Subsidy Scheme (ISDE) rose by 11% year-on-year between March and September, while subsidy applications increased by 21% for insulation and 150% for heat network connections in the first half of the year.

Grant applications for renovation, selected countries, 2025 and 2026



IEA. CC BY 4.0.

Notes: Denmark data cover applications for heat pump subsidies. Germany data combine BEG-EM envelope and BEG heating upgrade applications. Ireland data cover all Home Energy Upgrade applications, including for Better Energy Homes and solar PV. Netherlands data cover ISDE applications for (hybrid) heat pumps, solar water heaters, electric cooking appliances, insulation, district heating connections and ventilation.

Sources: Danish Energy Agency, 2026; Bundesamt für Wirtschaft und Ausfuhrkontrolle, Bundesförderung für effiziente Gebäude (BEG), (accessed 9 November 2026); Sustainable Energy Authority of Ireland (2026); Rijksdienst voor Ondernemend Nederland (2026), ISDE: Subsidie voor verduurzaming van uw woning.

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2.3 Appliances

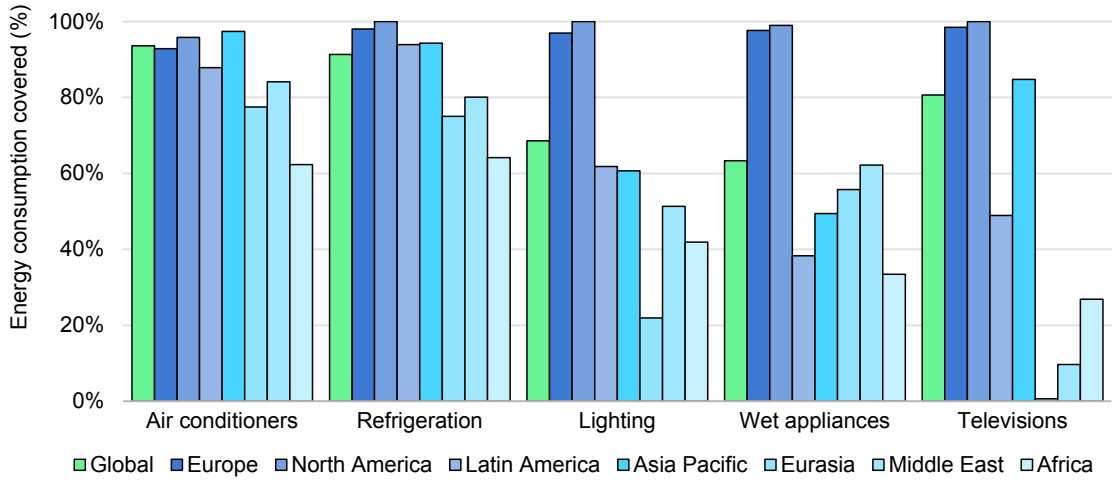
Coverage of minimum energy performance standards for appliances sees limited growth in 2026

Household appliances, space cooling and lighting account for around 40% of buildings electricity demand. Improving efficiency is critical to limiting electricity demand growth and easing pressure on power systems and energy resources.

Minimum energy performance standards are among the most widely adopted energy efficiency policies globally. By preventing inefficient products from entering the market, they raise the average efficiency of appliance stocks over time. Combined with energy labels that help consumers compare products and targeted incentive programmes where they exist, MEPS have played a central role in improving appliance efficiency worldwide.

Progress on stringency has varied regionally in 2026. Major EMDEs such as the Southern African Development Community have implemented ambitious regulations for air conditioners, with Brazil, China and India all tightening MEPS this year. Developments in other major markets moved in the opposite direction. In the United States, executive action initiated in 2025 is stopping 20 previously agreed equipment efficiency policy updates, although existing energy conservation standards have not been rescinded. Proposed procedural changes aim to increase barriers to future updates and decrease their frequency.

Energy use coverage of minimum energy performance standards for selected appliances by region, 2026



IEA. CC BY 4.0.

Notes: MEPS coverage for air conditioners, refrigeration and lighting is shown for residential sectors. Refrigeration includes refrigerators and freezers. Wet appliances include clothes washers, clothes dryers, washer-dryers and dishwashers.

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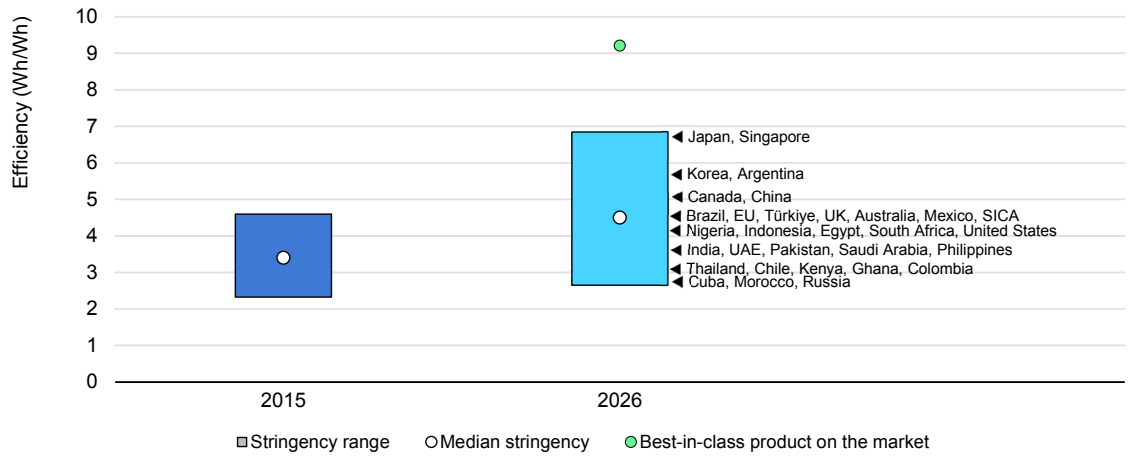
Countries tighten AC efficiency standards as cooling demand surges

Space cooling is one of the fastest-growing sources of electricity demand worldwide. Rising incomes and improving living conditions in EMDEs are driving increases in air conditioner ownership. A strong El Niño event has contributed to 2026 likely being one of the hottest years on record, leading to higher cooling demand. Global space cooling demand has increased by 50% over the last decade and now exceeds total electricity demand in the European Union. During peak periods, cooling contributed 1 400 GW to peak electricity demand globally, equivalent to the total installed power generation capacity in the United States.

Better urban design, passive cooling measures and more efficient air conditioners can all help limit growth in cooling-related electricity demand. While the average air conditioner sold today is around 20% more efficient than a decade ago, the best-performing models on the market are still more than twice as efficient. In response, several countries strengthened or proposed tougher air conditioner (AC) efficiency standards in 2026. Brazil and India increased MEPS stringency, while China proposed new requirements that would phase out fixed-speed ACs and encourage low-global-warming-potential refrigerants and flexibility capabilities. As the largest producer and exporter of air conditioners, China also introduced voluntary minimum energy performance levels for exported equipment which could raise efficiency levels in markets where domestic standards remain weaker.

Minimum energy performance standards for air conditioners, policy stringency, global country range, 2015 and 2026



IEA. CC BY 4.0.

Notes: EU = European Union. UK = United Kingdom. SICA = Central American Integration System. Japan's Top Runner programme requires manufacturers to meet a sales-weighted average efficiency of the best-performing devices in cycles of several years. Stringency refers to the subcategory with highest stringency. Values are harmonised to ISO CSPF efficiency. The European Union, the United Kingdom and Türkiye use EU-SEER. The United States, Canada and Mexico use SEER2. Country sample represents 86% of global total final energy consumption.

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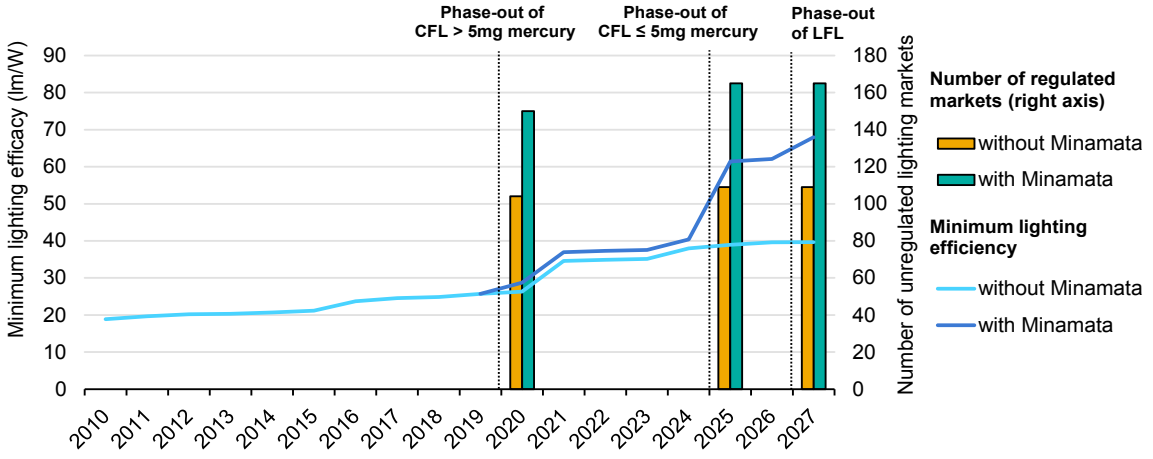
Lighting efficiency standards are set to strengthen significantly ahead of 2027

Lighting accounts for about 10% of global electricity demand today and has shown some of the strongest progress in efficiency. Twenty years ago, incandescent and halogen lights were the most common light sources, delivering just 12-20 lumens of light per watt of electricity (lm/W). An average LED bulb now reaches 100 lm/W and best-in-class models deliver more than twice that.

This strong efficiency increase has been accelerated by policy action. Nearly 120 countries have MEPS for lighting products in place, covering over 80% of global demand. Incandescent lights have been phased out in nearly 50 countries and fluorescent lights are phased out due to lower energy efficiency and their mercury content. The Minamata Convention on mercury has been ratified by over 150 countries. Since 2025 all compact fluorescent lamps have been phased out, with phase-out of linear fluorescent lamps planned in 2027. This is expected to avoid 158 tonnes of mercury pollution by 2050, almost all the mercury used in households.

Implementing *de facto* technology phase-outs through MEPS could significantly increase average minimum efficiency requirements for lighting globally. While many countries still have no or insufficiently stringent MEPS in place, average global policy stringency in 2026 is only 39 lm/W. If all signatories implemented the required fluorescent phase-out and followed the policy recommendation to phase out incandescent and halogen lighting, the average minimum level would increase to over 68 lm/W, with the same output for 43% less energy. Achieving the standard of LEDs sold today of about 100 lm/W would use around 61% less energy.

Global average minimum energy performance standard stringency for residential lighting of all types, comparing impacts of the Minamata convention, 2010 to 2027



IEA. CC BY 4.0.

Notes: CFL = compact fluorescent lamps. LFL = linear fluorescent lamps. Averages are unweighted. Country sample includes all countries representing 100% of global energy demand. The Minamata case assumes that all signatories to the Minamata convention phase-out CFLs and LFLs, in addition to incandescent and halogen lamps.

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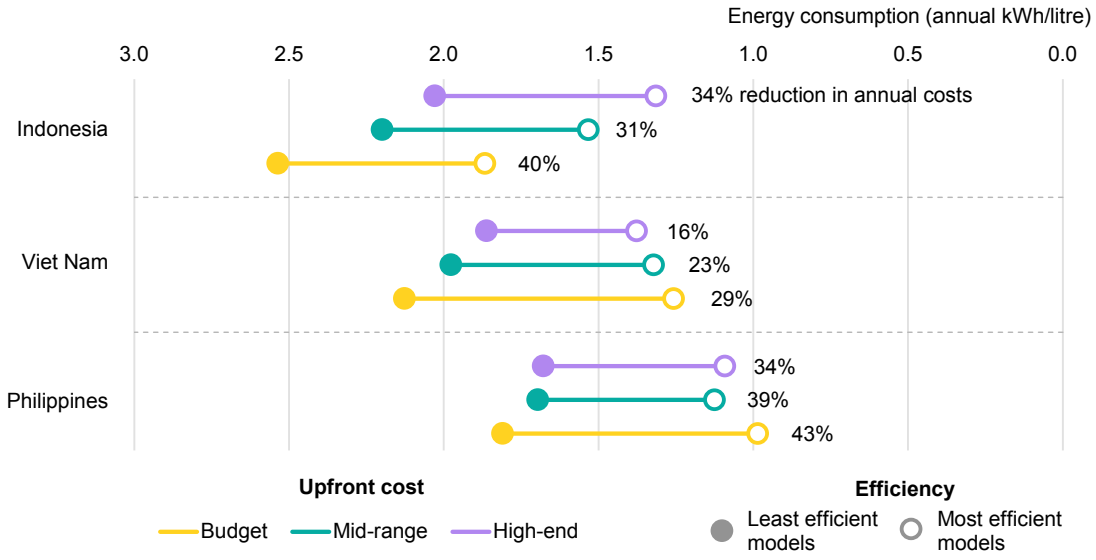
High-efficiency refrigerators can cut electricity costs by over 40% compared to models in the same price range

Analysis of models within the same price range in selected Southeast Asian countries shows that the most efficient refrigerator models can reduce annual electricity costs by up to 43% compared to low-efficiency models. Significant efficiency differences remain among similarly priced mid-sized refrigerators across the markets surveyed, resulting in large variations in running costs. The greatest savings opportunities are often found in lower-cost market segments, meaning that higher efficiency is not limited to premium products.

The availability of efficient refrigerators varies across markets. In the Philippines, which runs one of Southeast Asia's longest-running appliance labelling programmes, efficient models are available across a range of price segments. In Indonesia, where appliance labelling was introduced more recently for models up to 300 litres (a common model size), more efficient products are concentrated in higher-end market segments only. This suggests that stronger efficiency policies can help make efficient products more accessible to consumers across the market. More ambitious MEPS in line with leading countries could further extend these savings for households and businesses.

Efficiency and annual energy cost savings for mid-sized fridge-freezer models of similar purchase price ranges in Indonesia, Viet Nam, and the Philippines, 2025-2026



IEA. CC BY 4.0.

Notes: Mid-sized is defined as 150-250 litres. The figure shows the top and bottom 20th percentile of models by efficiency, and price. Price groupings are defined as <USD 250, USD 250-315, and >USD 315 in the Philippines, <USD 235, USD 235-280 and >USD 280 in Viet Nam, and <USD 205, USD 205-250, and >USD 250 in Indonesia, according to the prices of the top and bottom third of models available in retailers. Annual cost savings do not directly correspond with the estimated efficiency due to differences in country energy calculation methodologies.

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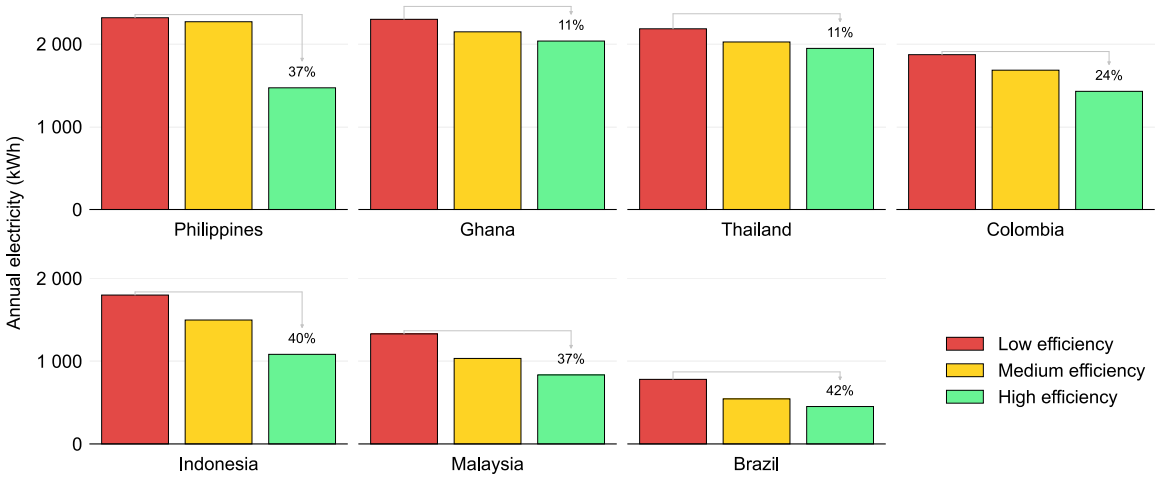
New 2026 market data show efficient ACs can cut lifetime costs by over 40% in emerging markets

Over the last four years, the IEA has collected appliance data, including price and efficiency levels, for models available on different markets across EMDEs. New analysis shows that the highest rated ACs on the market in the countries surveyed (up to 60% more efficient than the lowest rated) can reduce lifetime costs by 11-42%. This is particularly important as electricity costs over an AC's lifetime can be more than ten times the purchase cost. The findings suggest that stronger efficiency standards can deliver meaningful savings for households while limiting growth in cooling-related electricity demand.

The market data highlight how greater energy and cost savings across the same markets can be driven by more stringent labelling systems, although country differences are also caused by electricity prices and utilisation hours. In Indonesia for example, 5-star AC models available in retailers cost 40% less to run than 1-star models, as in Brazil, Malaysia and the Philippines. Labelling combined with regular updates to MEPS can support the best models become the new standard in several years, as for Japan's Top Runner programme.

The data further show that higher efficiency does not necessarily come at a higher upfront cost. In the Philippines, the best-selling 2026 brand averaged USD 515 with an average cooling seasonal performance factor (CSPF) of 4.5, compared with USD 460 for other high-efficiency models with a CSPF of 4.6.

Annual electricity demand for air conditioning in selected countries by low-, medium- and high-efficiency label groupings, 2022-2026



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Notes: For models available in retailers in each country, high efficiency is defined as the most efficient country label, with low efficiency the least efficient label, and medium efficiency the remaining label categories. Models are wall/split and window-mounted models with 2.5-4.0 kW cooling output. The number of models (n) >100 for each country. Annual electricity demand also varies with the hours of use.

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Demand-flexible appliances can help alleviate pressure on grids, but policy frameworks are only beginning to capture their full potential

Demand-flexible appliances can help balance electricity systems by shifting or adjusting their consumption in response to grid conditions or price signals. Products such as air conditioners, heat pumps and refrigerators can provide significant flexibility, particularly when combined with connected technologies and home energy management systems. To unlock this potential, appliances need to be demand-response ready and interoperable, allowing consumers to participate in flexibility programmes without being locked into specific technologies or providers.

Despite growing interest, only a limited number of countries have introduced product policies or regulatory frameworks that promote appliance flexibility. New Zealand is progressing proposed amendments to its legislation to enable product regulations that support flexibility, while China has incorporated demand response functionality into appliance MEPS and labels. The state of South Australia requires certain appliances to be demand-response capable, with work underway to agree national interoperability standards for demand-flexible appliances. Meanwhile, market-based programmes such as the United Kingdom's Demand Flexibility Service are creating incentives for consumers to provide flexibility to the grid. As a result, the United Kingdom avoided 3.9 GWh of electricity demand at peak periods through demand flexibility during the winter of 2024/25, and since 2026 the scheme has expanded to reward consumers not only for reducing demand at critical times but also for increasing consumption when it helps balance the electricity system.

In China, Jiangsu province illustrates how appliance flexibility can be implemented through a large-scale residential virtual power plant, aggregating millions of household appliances, particularly air conditioners. By working with appliance manufacturers, Jiangsu State Grid has developed a system enabling consumers to voluntarily reduce or shift electricity use at peak demand periods, when they can benefit from financial incentives. Since summer 2024, more than 2.8 million households have been invited to join the programme, delivering over 500 MW of peak demand response. According to preliminary statistics from the provincial government, there were more than 7 million internet-connected residential appliances with an estimated flexible load potential of 9 GW, demonstrating the significant opportunity for residential demand-side flexibility to support power system efficiency.

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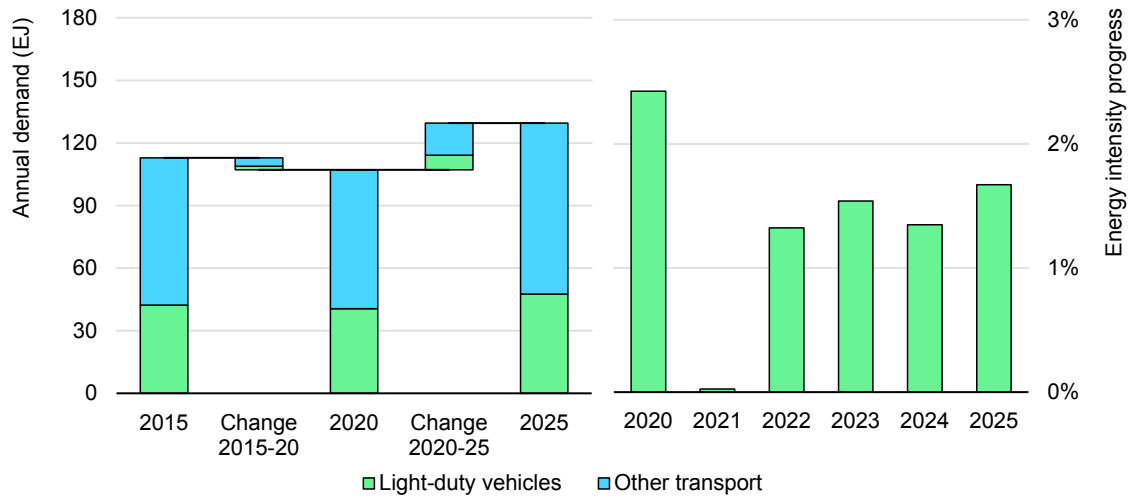
2.4 Transport

Transport sector efficiency improves as electrification gathers pace

Transport consumed around 129 EJ of final energy in 2025, representing around 28% of global final energy demand, with oil products accounting for the vast majority of consumption. Energy use grew by approximately 15% between 2015 and 2025, driven largely by rising passenger vehicle ownership and expanding road freight activity in EMDEs, particularly in China, India and Southeast Asia. Meanwhile, light-duty vehicles continue to see improvements in energy intensity, averaging 1.5% per year since 2022, driven by increasing sales of hybrid and electric vehicles.

The adoption of electric vehicles continues to accelerate. In 2025, one in four new cars sold globally was electric, contributing to sustained gains in the energy intensity of light-duty vehicles. Higher fuel prices provided additional momentum in 2026, with second-quarter sales rising 4% year-on-year, despite slower growth in the first quarter. Electrification is progressing across road transport modes. Electric two- and three-wheelers remained the most electrified road transport segment with sales reaching 11 million in 2025, while electric truck sales doubled, reaching 9% of truck sales worldwide.

Transport energy demand and energy intensity improvements for light-duty vehicles, 2015-2025



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Note: Energy intensity is calculated as energy consumption over passenger-kilometres for light-duty vehicles only, and energy intensity progress represents a reduction in intensity.

Source: IEA (2026), World Energy Outlook 2026.

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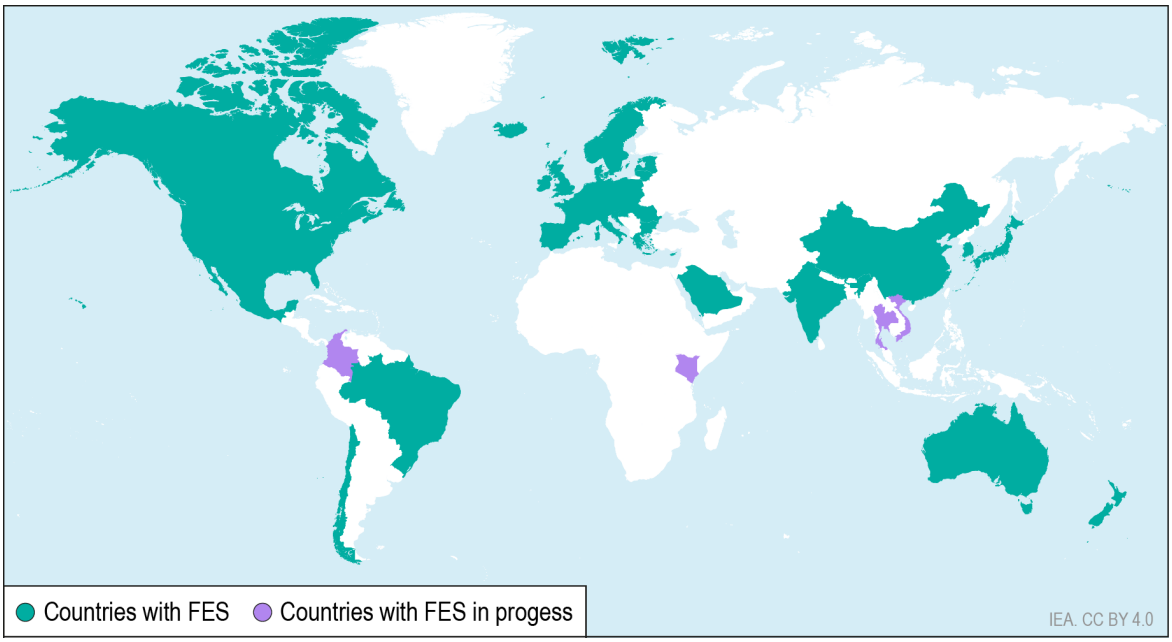
Most passenger car energy demand is covered by fuel economy standards

In 2026, more than 40 countries, accounting for about 70% of global road transport energy demand, have fuel economy standards for passenger cars in place. While electrification policies are becoming more widespread, fuel economy standards remain the most widely adopted policy to improve transport energy efficiency. In the United States, the 2026 rule change represents a substantial reduction in ambition, particularly with respect to electrification. At the same time, India adopted new standards in 2026 after proposing them in 2024, while in Viet Nam new standards have been proposed for 2030.

In 2025 and 2026, governments continued to expand and refine policies supporting passenger car electrification, and over 25 governments adopted new measures in response to the oil crisis. Many governments combine EV deployment targets with measures to improve affordability and other fiscal incentives. These included sales share targets in Canada, targeted incentives for lower-income households in Germany, social leasing in France, scrappage incentives in China and Ecuador, and additional subsidies in Colombia and Greece. Additionally, Lao PDR introduced a temporary ban on imports of internal combustion vehicles, joining Ethiopia, where the phase-out has been in place since 2024.

Global coverage of fuel economy standards and other regulations for passenger cars, 2026



Notes: FES = fuel economy standards. Countries with FES shows countries with existing fuel economy standards or equivalent regulations. Countries with FES in Progress shows those undertaking activities to implement them in the near future and is not exhaustive (as of September 2026).

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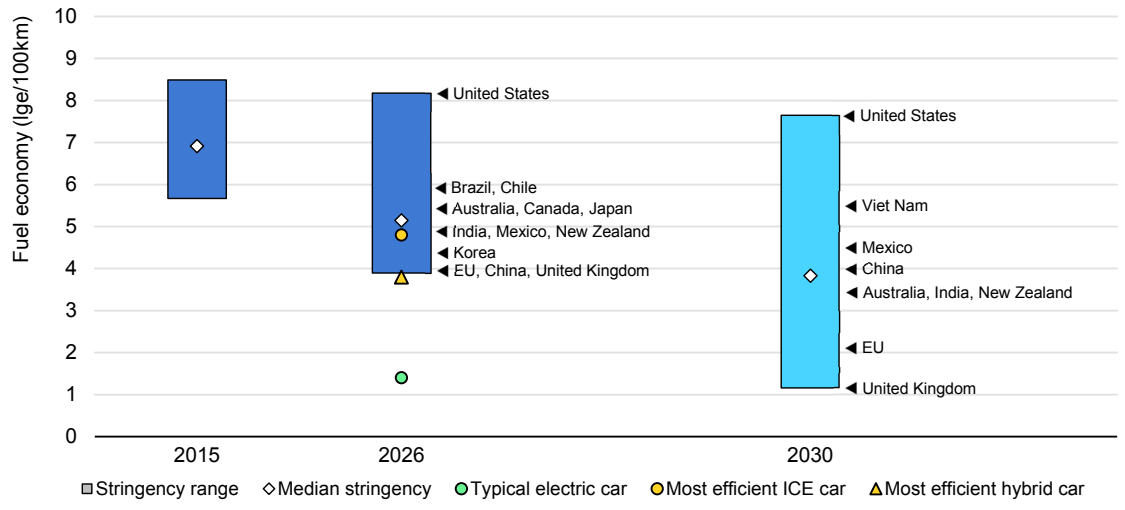
Fuel economy standards become more stringent in 2026, but policy direction shows weakened ambition

In 2026, the global average stringency of fuel economy standards increased by about 1.3% compared with 2025, although changes varied across countries. New Zealand slightly lowered the improvement increments for 2026 and the following years. Viet Nam proposed its first national fuel economy standard for passenger cars, targeting efficiency levels comparable to those in Brazil by 2030. Canada initiated the repeal of its zero-emission vehicle mandate from 2026 but announced plans to enhance fuel economy standard stringency for light-duty vehicles in 2027. In the European Union, the 2035 target for fleet-average emissions reductions was revised from a 100% to a 90% reduction relative to 2021 levels, providing manufacturers with greater flexibility to retain some internal combustion engine vehicles after that date in response to growing competitive pressures facing European automakers in the electric vehicle market.

In the United States, fuel economy standards have been lowered significantly, removing EVs from the fleet performance calculation and eliminating civil penalties for manufacturer non-compliance. India finalised its significantly enhanced standards, applicable from 2027 to 2032, representing around a 30% improvement on the 2026 target.

Fuel economy standards, passenger cars, policy stringency, global country range, 2010, 2026 and 2030



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Notes: ICE = internal combustion engine. All fuel consumption is normalised to the Worldwide Harmonised Light Vehicles Test Procedure and tank-to-wheel efficiencies according to the International Council on Clean Transportation methodology. Fuel economy standards for 2026 are in force; 2030 values are those defined in current policies. Target fuel economy standards for the United States and Viet Nam in 2030 are at the proposal stage. All example vehicles are model year 2025. Most efficient ICE car: Toyota Aygo X. Most efficient hybrid car: Mazda 2 Hybrid 1.5. Typical electric car: Tesla Model 3. The values cover only usage phase efficiency and do not allow lifecycle assessment. Country sample represents 71% of global road transport energy demand.

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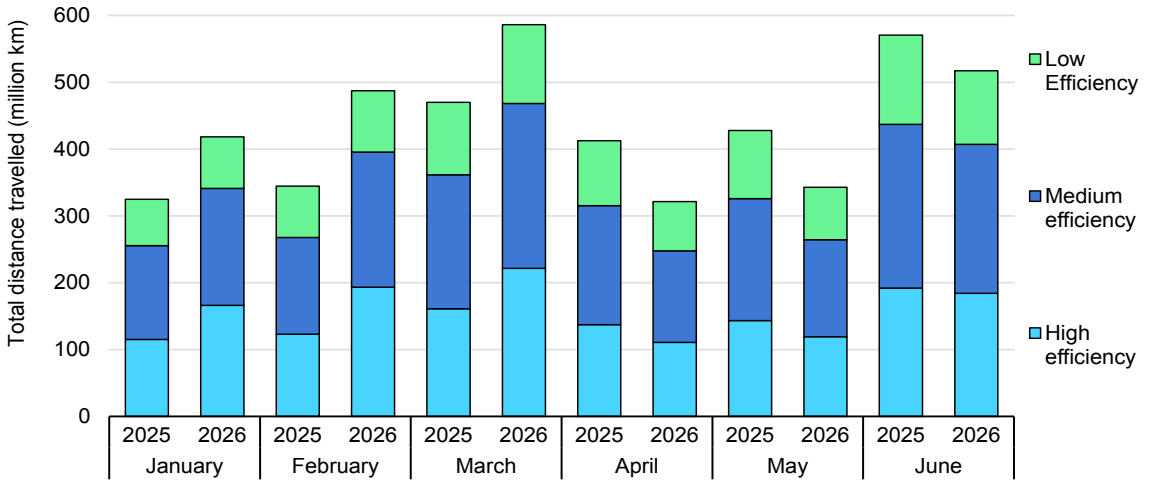
Flight activity shifts towards more fuel-efficient aircraft as air travel declines

Aviation is among the most energy-intensive and oil-dependent modes of transport. Oil accounts for more than 99% of its energy use. Since 1990, more fuel-efficient aircraft have more than halved aviation energy intensity, but demand growth consistently outpaced these gains. Recent disruptions to oil supplies highlighted the sector's vulnerability. Limited jet fuel availability and higher prices increased costs and disrupted operations. In May 2026, US airlines' fuel expenditure was 84% higher than a year earlier with little change in fuel consumption, and jet fuel shortages contributed to the cancellation of around 13 000 flights globally.

The impact was noticeable in Europe, where the Middle East typically supplies around 75% of net jet fuel imports, leaving the region particularly exposed to supply disruptions. Flight activity decreased as airlines responded to crisis-related jet fuel shortages and higher operating costs. IEA analysis of flight patterns indicates that flight cancellations were concentrated among older, less fuel-efficient aircraft, whose share of flight activity fell through April-June and was 2% lower year-on-year in June, temporarily improving fleet-average efficiency. These changes reflected short-term operational responses to the crisis rather than structural improvements in the fleet. While such adjustments can reduce fuel use in the short term, long-term resilience will depend on the deployment of more efficient aircraft, complemented by the scale-up of sustainable aviation fuels through policies such as the ReFuelEU Aviation Regulation.

Share of aircraft type by efficiency class, wide-body models, 2025-2026, European Union



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Notes: The analysis includes the 31 wide-body aircraft types accounting for over 90% of total distance travelled and covers flights departing from or arriving in the European Union.

Source: IEA analysis based on IEA flight data for aircraft specific distances travelled, with aircraft technology efficiency data from manufacturers and other technical resources.

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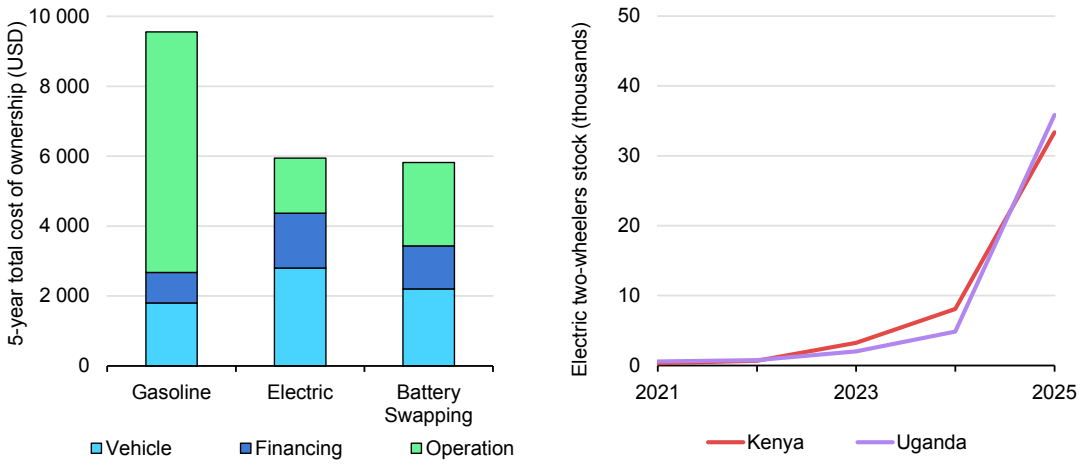
Electric two-wheeler adoption accelerates in Africa as earlier policy support meets higher fuel prices

The 2026 oil crisis highlighted how earlier policy support can accelerate market responses to fuel price shocks. The trajectory of electric two-wheelers (E2Ws) in Africa following the crisis provides a clear example.

E2Ws are much more efficient than their gasoline equivalents, and high petrol-to-electricity price ratios, combined with a large share of high-mileage commercial users, make them particularly attractive in many African markets. Seeking to reduce fuel imports, improve energy security and support local industry, several countries introduced E2W policies and encouraged investment before the crisis. East Africa now accounts for almost half of all African EV companies, with Kenya and Uganda standing out. Despite regulatory uncertainty surrounding manufacturing and taxation incentives, investment reached up to USD 160 million in Uganda by 2024, while Kenya alone hosts around a quarter of all African EV companies. This helped E2Ws account for around 15% of new registrations in 2025.

Higher fuel prices in 2026 reinforced the value of these earlier efforts, with E2W sales reportedly increasing by 40% in Kenya in the months following the crisis. However, higher upfront costs and unfavourable financing conditions continue to curtail uptake. Battery-swapping business models can help address these barriers by reducing upfront costs and offering alternative ownership models. Companies including Arc Ride, Roam, Spiro, Zembo and Zeno all raised capital in 2025 and 2026 to expand operations.

Total cost of ownership (left) and stock (right) of a two-wheeler in Kenya and Uganda



IEA. CC BY 4.0.

Notes: Financing is the total cost of credit. Operation includes insurance and maintenance.
Sources: Vehicle specifications and financing conditions are adapted from UNEP (2026), Capital 2 Mobilize: Business models, financing mechanisms and growth drivers for electric two- and three-wheelers in Low- and Middle-Income Countries. Sales are from CleanTechnica (2026), Electric Motorcycles Reach 15.3% Market Share of New Registrations in Kenya in 2025; Science, Technology and Innovation Secretariat, Mobility Bureau, Uganda (2024), Uganda E-Mobility Outlook Report 2024; IEA (2026), Global EV Outlook 2026. Prices are from IEA (2026), End-use Energy Prices,(accessed 9 November 2026). Battery swapping is four times the residential electricity cost.

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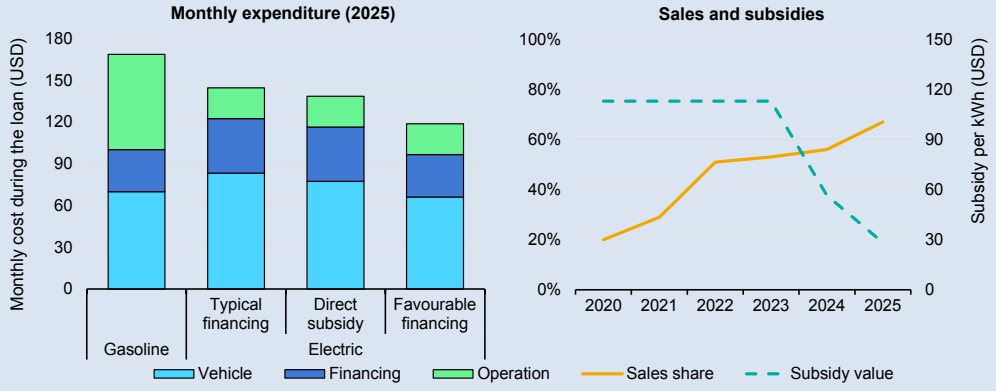
Competitive financing in India has made electric three-wheelers more affordable, even as subsidies end

Although a relatively small market, with around 4.5 million units sold globally, three-wheelers play an important role in affordable urban and last-mile mobility in emerging economies. In India, however, electric three-wheelers remain around 25% more expensive than gasoline models and face less favourable financing conditions, raising upfront and monthly costs, despite lower total costs.

While purchase subsidies have helped accelerate EV uptake, broad-based programmes can be costly to scale and tend to benefit wealthier households, and growth can slow down when they end. After identifying the financing barrier, India moved to treat electric vehicles as a priority sector for lending, encouraging more banks to compete to offer lower interest rates, longer loan terms and smaller down payments. These banks joined a growing number of financial companies also offering increasingly competitive credit. More favourable financing conditions can result in E3W monthly payments 20% lower than for typical financing, also lower than if getting a subsidy for an E3W or buying a gasoline three-wheeler (3W). This has contributed to almost 70% of all 3Ws sold in 2025 being electric. It also allowed India to reduce subsidies, while maintaining strong growth in sales.

India is now considering developing a more explicit government-backed scheme to offer favourable finance for electric buses and trucks. Similar to E3Ws, they may have lower total costs, but perceived risk leads to poor lending conditions, impacting attractiveness and affordability. Evidence from the 3W market suggests that this could be highly cost effective and, at a loan default rate of 2-4%, credit guarantees would have been around 50-95% cheaper than the 3W subsidies.

Monthly cost of a three-wheeler (left), sales share and subsidy value (right), India



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Notes: Vehicle is the upfront cost of the 3W minus the down payment, divided by the loan term. In the case of direct subsidy, the 2025 subsidy value (assuming a 9kWh battery) is also deducted. Financing is the monthly cost of credit. Operation includes fuel or charging, insurance and maintenance.
Sources: Vehicle specifications and financing conditions adapted from UNEP (2026), Capital 2 Mobilize: Business models, financing mechanisms and growth drivers for electric two- and three-wheelers in Low- and Middle-Income Countries, sales share from IEA (2026), Global EV Outlook 2026.

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2.5 Power systems

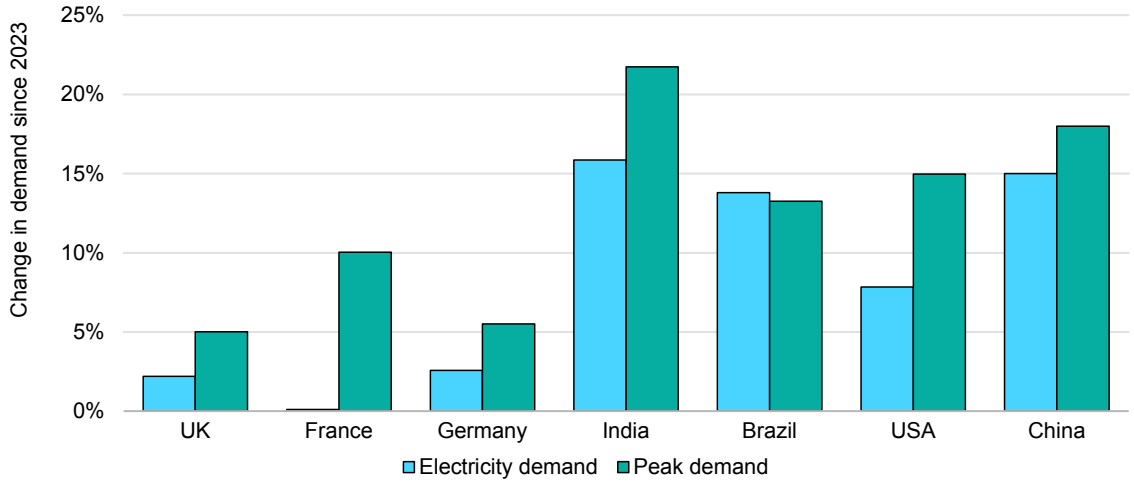
Rising peak loads in 2026 strengthen the case for efficiency and flexibility

Peak electricity demand has grown by more than 20% in some regions since 2023, increasing pressure on power systems and reinforcing the value of efficiency and demand flexibility. These measures can mitigate peak demand growth, ease grid constraints and improve the efficiency of investment in grid expansion, which is expected to rise by 20% globally in 2026 to around USD 540 billion.

Since the start of the 2026 energy crisis, many countries have accelerated electrification plans to strengthen energy security and reduce dependence on imported fuels. Ahead of COP31, the Presidency proposed a target of reaching 35% electrification of total final energy consumption by 2035, while the European Union, Chile and France released new electrification strategies.

As electrification advances, electricity demand is projected to grow by around 4% per year through 2030, up from around 3% over the past decade, with emerging economies accounting for around 80% of annual growth. But in many countries, peak demand is rising even faster, driven by growth in temperature-dependent demand. In India, peak demand has increased by more than 20% since 2023, largely driven by AC ownership that has tripled in the last decade, amid another year of record-high temperatures. Meanwhile, in Europe, network operators faced increased stress, with significant growth in peak demand in countries such as France, Germany and the United Kingdom.

Growth in average and peak electricity demand for major economies, 2023-2026



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Notes: Electricity demand compares total electricity demand from January to June for 2023 and 2026. Peak demand compares the peak in 2023 and the peak from January to June for 2026.

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Demand flexibility policies have advanced in 2026, but important gaps remain

Countries are increasingly looking to demand flexibility as a way to balance power systems at lower cost while accommodating rising electricity demand and growing shares of variable renewables. In order to help governments identify best practices and create the conditions needed to unlock flexible demand, the IEA has developed a Demand Flexibility Enablers Framework. Through expert consultations and analysis of 75 policy aspects per country, the IEA identified seven areas as particularly important for enabling flexible demand:

- **Policy and Regulatory Foundation:** A national mandate and supportive regulations provide the foundation for progress across all other areas. Early-stage markets lack targets or standardised measurement, but they might have isolated pilot projects. Mature markets embed binding targets in planning, have standardised verification processes and support the transition from pilot projects to permanent regulatory frameworks.
- **Metering Data and Digital Infrastructure:** Granular and accessible metering data provides the foundation to turn flexible demand into consumer and grid cost savings, particularly through automation. Early-stage markets have limited smart-meter rollout and device interoperability. Mature markets combine near-universal rollout with open protocols to securely deliver real-time data.
- **Retail Tariffs and Price Signals:** Price signals translate power system needs into economic incentives for consumers to shift or reduce demand. Early-stage markets offer only flat tariffs. Mature markets have adopted time-varying pricing, including time-of-use (dynamic or hourly) and critical peak pricing.
- **Digital End-Use Technologies:** Price signals can be combined with demand-response-ready technologies like EVs, ACs or heat pumps, and smart appliances. Early-stage markets often lack interoperability standards and flexibility-enabled services. Mature markets see these technologies deployed at scale, flexibility-ready and capable of responding automatically to price and system signals.
- **Electricity Markets and Grid Services:** Market access will determine payments to flexible consumers. Early-stage markets lack formal access, with firm-only grid connections. Mature markets give non-discriminatory access to intraday markets, balancing, and other grid services, with default flexible network connections.
- **Aggregation and Third-Party Market Access:** Aggregation and proportionate market access are crucial to unlocking flexibility. Early-stage markets do not allow independent aggregation. Mature markets have an established dispute settlement, lower minimum bid sizes and a competitive aggregator market.
- **Consumer Protection, Engagement and Awareness:** Consumer confidence and participation determine the extent of flexible demand. Early-stage markets offer no flexibility-specific protections and might have exit penalties. Mature markets actively enforce consumer protections, proactively monitor and support vulnerable consumers and facilitate switching between flexibility providers.

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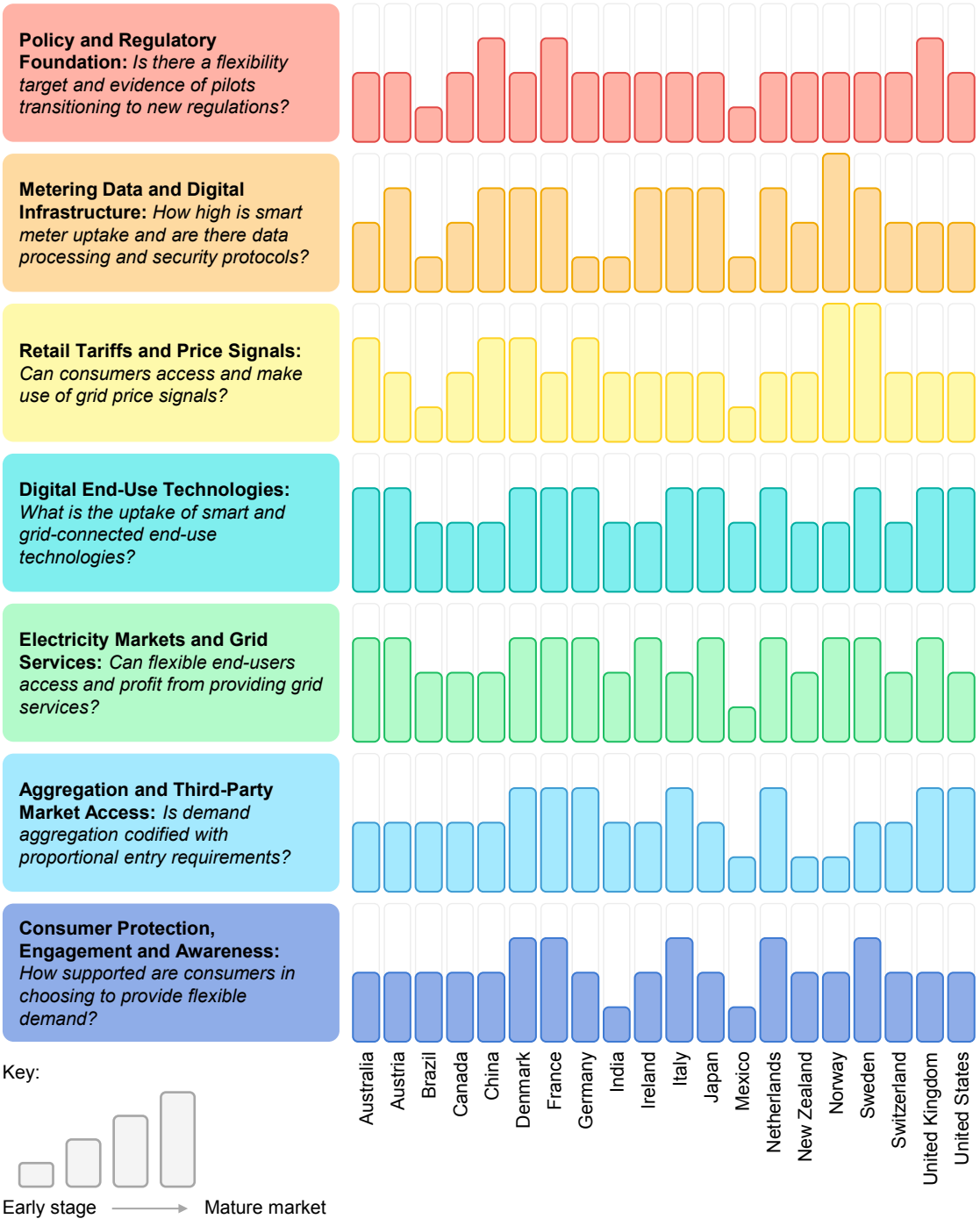
The framework has been applied to selected countries to identify the elements of a country's policy landscape and to highlight areas for potential development:

IEA Demand Flexibility Enablers Framework applied to selected countries, 2026



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Notes: Based on analysis of the presence and uptake of 75 different policies aspects across the seven categories, countries have been scored from 1 (early-stage) to 4 (mature). Australia, Canada, China, India and the United States operate subnational electricity markets with distinct characteristics. The graphic shows an average across each.

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Several countries recently set national targets for demand flexibility, including China (5% of peak load by 2030), Ireland (20-30% of annual demand by 2030) and the United Kingdom (10-12 GW by 2030). Many recently allowed demand-side resources to participate alongside conventional resources in providing grid services, including Austria through its 2026 electricity market reform and the United Kingdom through updates to its capacity market. Around half of the countries surveyed have exceeded 90% smart meter coverage, while also building the digital infrastructure to make effective use of large volumes of data.

While suppliers in many countries now offer time-varying tariffs, uptake remains limited unless such tariffs are the default option, as in France, Italy and Spain. To accommodate for some residential consumers preferring fixed tariffs, some suppliers in Spain, the United Kingdom and California offer technology-specific tariffs for equipment that can more easily shift demand, such as electric heating and EVs. When combined with time-varying pricing, a competitive market for demand aggregators can maximise consumer cost savings while managing control and optimisation. The country-level averages mask more significant progress in some subnational regions.

Regulatory uncertainty can be a barrier, particularly relative to the pace of technological changes, with rules that can be ambiguous or lack specificity in how they apply to demand flexibility. Clear pathways to move from pilot projects to regulations are crucial to support demand shifting and market designs. France has a mature regulatory sandbox programme which allows temporary derogations of regulations for pilot projects. This has supported 15 demand flexibility regulatory derogations since 2020, 11 of which resulted in legislative changes. This process has helped demonstrate the value of rewarding demand shifting, informing broader market rule changes in late 2025 that support demand shifting.

Building consumer trust will be critical to the further development of demand flexibility. Countries with mature flexibility markets, such as the Netherlands and Sweden, have adopted user-centric approaches to energy data governance, allowing consumers to retain data ownership while frictionlessly changing suppliers. In the United Kingdom, the energy ministry commissioned the development of a smart response standard for smart appliances to enable seamless transfer of data between stakeholders and includes a requirement for owner override that is now the industry standard. Spain has also developed dynamic social tariffs to ensure households can take advantage of cost savings without being unfairly penalised.

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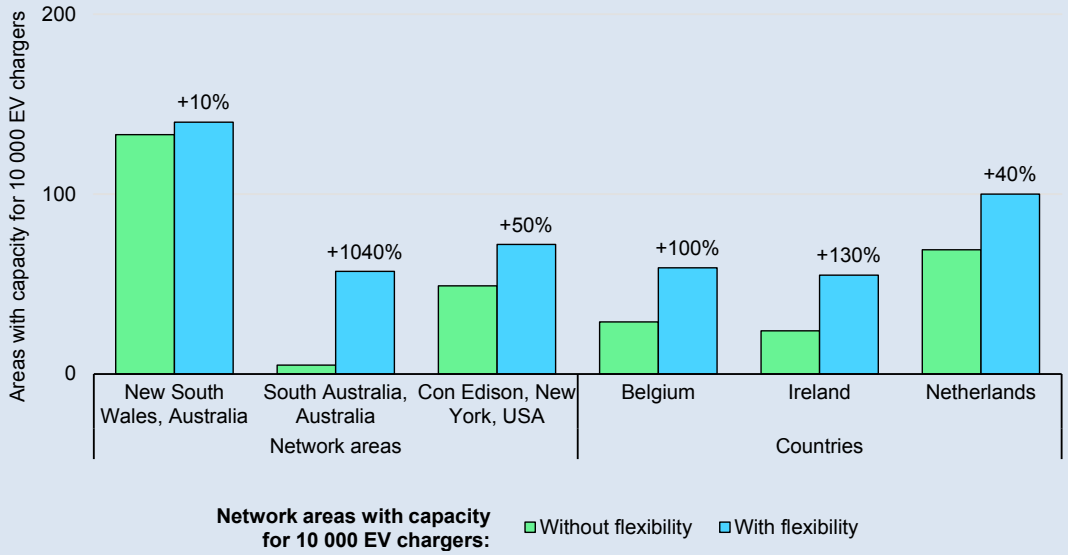
As grid constraints grow, flexibility could increase EV charger connection capacity by more than 50%

In recent years, many regions, including Denmark, Ireland and the PJM network of the United States, have dealt with grid constraints which have become a bottleneck for connection of new demand like EVs or data centres. In the Netherlands, grid congestion is estimated to have cost the economy around 2.5% of GDP in 2024. In 2026, several countries, including the Netherlands, Sweden and Switzerland, incorporated new connection rules to make better use of existing grids, showing how combining efficiency and flexibility can relieve network constraints.

IEA analysis shows that flexible EV chargers could increase the number of network areas – sections of the grid served by a local substation – able to accommodate 10 000 additional EV chargers by more than 50% in some regions, without the need for grid upgrades. This number of chargers is equivalent to the target for the city of Montreal announced last year. Across the network areas with available data, this could total more than 3 million new chargers, more than double the number currently installed in the European Union. While flexibility cannot completely replace the need for network investment, it can help alleviate capacity constraints while upgrades are planned and delivered.

Number of local network areas with available capacity to accommodate the equivalent load of 10 000 additional EV chargers under regular and flexible operation, without grid upgrades, selected countries, 2026



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Note: Network areas vary in size and characteristics across operators; 10 000 chargers represent a common capacity benchmark with a peak charging demand of 7.3 MW for unmanaged charging and 3.9 MW for smart charging.

Source: IEA analysis based on Elia (2026), Grid Hosting Capacity; ESB Networks (2026), Availability capacity heatmap; Comisión Nacional de los Mercados y la Competencia (2026), Capacidades de demanda; Netbeheer Nederland (2026), Capaciteitskaart; Powercor (2026), Network data; Con Edison (2026), Hosting Capacity Web Application; and Ausgrid (2026), Distribution and Transmission Annual Planning Report data portal, (accessed 14 September 2026).

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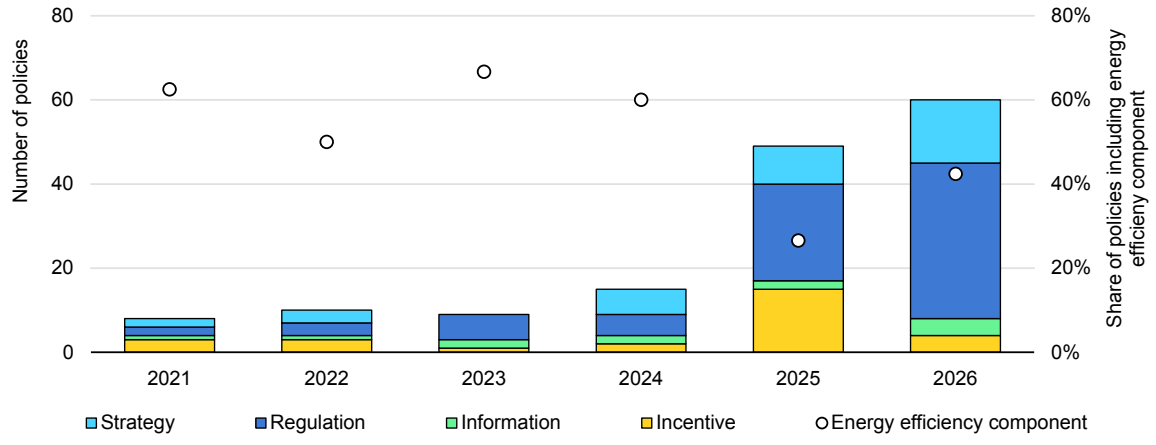
Data centre policy accelerates in 2026, but rapid growth in capacity risks undermining energy efficiency gains

Since 2021, governments have increasingly focused on data centre policies as AI-driven growth accelerates. Measures have sought to attract investment, integrate rising electricity demand into power systems and embed data centres within broader digital and industrial strategies. Policy activity accelerated in 2025, with three times as many announcements as in 2024, and has accelerated further in 2026. Among the new data centre policies tracked by the IEA in 2026, around 40% include an energy efficiency component.

By 2025, jurisdictions accounting for around 25% of data centre capacity had minimum efficiency standards in place. In 2026, policy announcements broadened geographically and expanded beyond traditional facility efficiency. Announcements included proposed cooling-equipment standards in Canada, national strategies in the Philippines and Portugal, and measures addressing electricity-system impacts in Oregon and Virginia in the United States.

Policy activity broadly mirrored the geographic distribution of data centre capacity, concentrated in China, the United States and Europe. However, the nature of policy interventions varies by region. In Asia Pacific, governments emphasised investment incentives, including in India, Indonesia, Japan, Malaysia, Korea and Thailand. By contrast, a notable emerging trend in 2026 has been the rollback of fiscal incentives in Finland, and several US states, with Arizona, Connecticut, Maryland, Ohio and Oregon scaling back previous tax incentives for new data centre developments.

Data centre policy announcements identified by type, 2021-2026



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Note: Measures are classified by policy type and assessed for whether they include explicit energy efficiency provisions.

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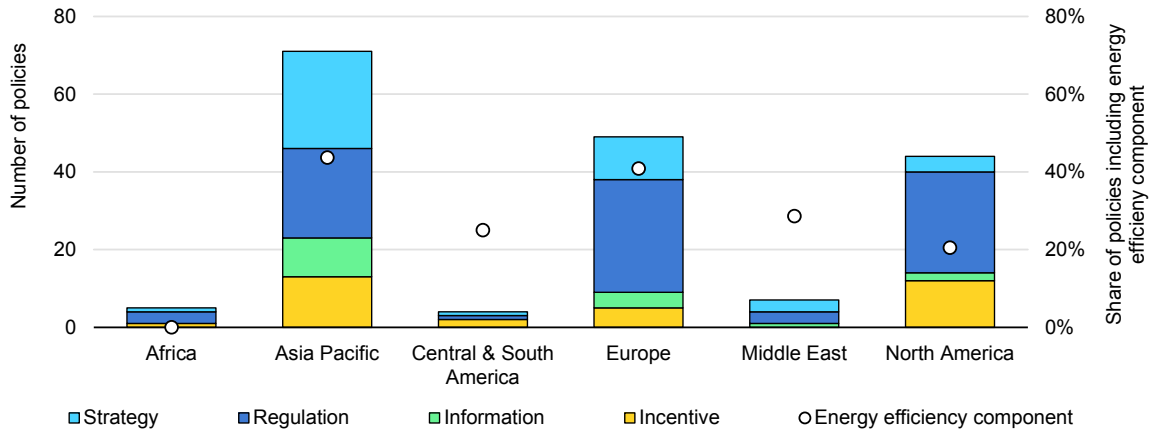
In Ireland, where data centres account for around 23% of electricity consumption, a *de facto* moratorium on new data centres since 2021 due to local grid constraints was overturned in December 2025. However, in the Netherlands, a 2022 restriction on hyperscale data centres remains in place, and tightening of the restriction will be considered later this year. New York became the first state in the United States to announce a moratorium on new data centres, with others being tabled elsewhere.

Efficiency measures increasingly combined performance requirements, transparency and technology support. The European Commission advanced a common sustainability rating scheme, subject to legislative scrutiny, and launched consultation on minimum performance standards. Spain proposed linking grid access to stringent energy and water efficiency requirements. In China, green public procurement requirements for data centres have set progressively tighter energy efficiency thresholds, including a maximum power usage effectiveness (PUE) of 1.3, alongside requirements for energy management and monitoring. Singapore proposed PUE limits on all data centres in the proposed Digital Infrastructure Act and introduced a new standard for liquid cooling for data centres in tropical climates. In Japan, the government launched funding to develop and demonstrate energy-saving technologies. Canada proposed new minimum energy efficiency and testing standards for computer room air conditioners from May 2028. Australia's national expectations promoted efficiency and demand flexibility, complemented by New South Wales guidelines offering faster planning assessments for projects meeting environmental and efficiency measures.

Data centre policy announcements identified by region, 2021-2026



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Chapter 3. Regions

3.1 China

China ramps up policy action as energy efficiency improvement rates continue to recover

China's energy intensity improvement is expected to be over 3.5% in 2026, continuing a reversal in the decline observed at the start of the decade. Intensity progress notably accelerated in the second quarter of this year, as energy demand growth slowed down to about 1.5% compared to the same period last year, down from 3.9% in the first quarter. GDP growth remained resilient through the third quarter, supported by the rapid growth of high-tech manufacturing and exports, despite the downturn in domestic demand.

The slowdown in energy demand growth is notable in oil, which is expected to fall 3.3% year-on-year as a result of different factors partly related to higher fuel prices and long-term measures. The increased use of electric vehicles, record shares of new energy vehicles in car sales, and higher rail use contributed to lowering gasoline demand, while lower construction activity and record sales of electric trucks reduced the demand for diesel. Besides, supply constraints affected demand for petrochemical feedstocks. This year's cooler summer (with cooling degree days down around 13%) and milder winter (heating degree days down 7% as of November) also eased pressure on demand for fuels and electricity.

Between 2020 and 2023, China's rate of energy intensity improvement slowed to around 0.6% from an average of 3.6% per year the decade before. The slowdown was most notable in the industrial sector, which accounts for about 50% of China's final energy consumption, with intensity progress going from nearly 6% per year to about 1%. Several factors contributed to weaker industrial efficiency improvements over this period, including delayed equipment upgrades following pandemic-related disruptions, an industrial strategy that saw significant government investment in strategic industries, and economic uncertainty for enterprises.

Against this backdrop, China significantly increased policy action on energy efficiency, driving the improvements seen in recent years. A series of policies released in 2026 have seen momentum grow even further. In April 2026, China's State Council, the country's highest administrative body, released a major directive on energy conservation and carbon reduction. It also directed subnational governments to strengthen incentives for industry through locally

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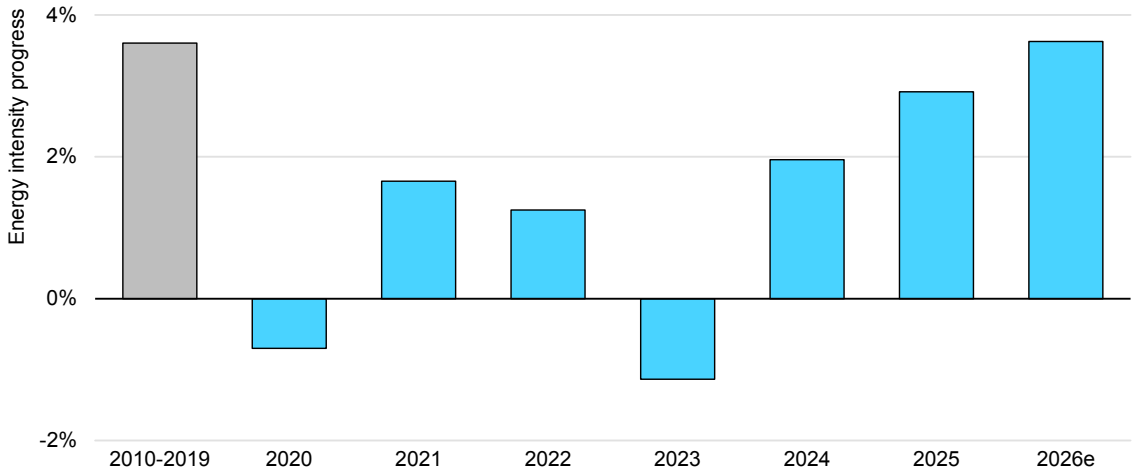
implemented reward systems. This was followed in the same month by the Carbon Peaking and Carbon Neutrality Comprehensive Evaluation and Assessment Method, which establishes a new accountability system for provincial progress on China's dual carbon goals, peaking emissions before 2030 and reaching carbon neutrality before 2060.

Under the mechanism, performance assessment for regional government officials will place greater emphasis on indicators, including emissions reductions, energy intensity improvement, the share of non-fossil energy, and decarbonisation of industry and transport. Traditionally, performance evaluation criteria have focused more heavily on metrics such as local economic growth and infrastructure development. The new system expands the role of efficiency and carbon targets in official career advancement, providing stronger incentives for local implementation and enforcement.

Additionally, China released its Ecological and Environmental Code in March 2026. The code consolidates disparate climate and energy regulations into an enforceable legal framework. This includes carbon intensity targets and energy efficiency labels, along with energy intensity benchmarks and cut-off limits for large industry. The Code also instructs local governments to enforce energy efficiency more strictly and continues the longstanding requirement for large energy-consuming enterprises to conduct annual audits and report on their energy consumption. These policies reflect a strategy that allows for flexible policy solutions based on varying regional contexts wherein the central government sets high-level targets and local governments implement tailored policies to achieve them.

Primary energy intensity improvement, China, 2010-2026e



IEA. CC BY 4.0.

Note: 2026e = estimated values for 2026.
Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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China has been relatively shielded from the crisis

China's energy mix makes it relatively sheltered from the impacts of the current conflict in the Middle East when compared to other countries in its region. Its power sector relies on coal (most of which is mined in China) for around 50% of electricity generation, which means that domestic electricity prices are not highly exposed. China also holds very large oil inventories (some estimates suggest nearly 1.4 billion barrels worth at the end of 2025), which appear to have grown further following China's Energy Law, which entered into force in January 2025. The law requires companies to hold "social responsibility" stockpiles, thereby increasing the country's reserve capacity (in 2025, the government storage facilities were estimated to be around 80% full).

This provided some cushioning to the global fuel price increase and gave the government flexibility to put in place measures that alleviated the burden on domestic consumers. After the outbreak of the current conflict, China's National Development and Reform Commission (NDRC) imposed temporary control measures on the country's official pricing formula that would usually reflect international crude prices. On 23 March 2026, the NDRC stated that the formula called for a USD 328/tonne rise in gasoline, but the government capped the actual increase at around USD 173/tonne. The roughly 50% price difference was absorbed by China's oil companies to protect consumers. A similar intervention occurred in April before the pricing mechanism returned to normal in July.

China decreased its crude oil imports by around 40% (or 4.6 million barrels per day [mb/d]) from February to May 2026, significantly absorbing the shock in global markets. The drop-off in stock contribution explains a portion of this decrease, while cuts in refinery runs as well as the increasing electrification of transport can explain another portion. The IEA estimates that more than 1.5 mb/d of Chinese road fuel demand was substituted by EVs during Q2 2026, with a displacement of 620 kb/d compared to last year. Additionally, in March, China imposed a temporary halt on exports of refined fuels (including gasoline, diesel and jet fuel) to safeguard domestic supply. Restrictions were reportedly lifted in July. Industrial stakeholders have indicated that they may miss output targets, while the increased cost of inputs for the petrochemical industry is also a concern for enterprises operating on thin margins.

There is limited evidence of explicit demand-side policy measures in China's response to the current energy shock. Rather, it is likely that several long-term policy actions were accelerated. This includes the previously mentioned policy directive on energy conservation and carbon reduction that explicitly linked energy efficiency, decarbonisation and energy security, as well as long-term strategies on electrifying road transport.

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The 15th Five-Year Plan will shape China's economy and frame efficiency progress until 2030

In March 2026, the government approved its 15th Five-Year Plan (FYP). The plan sets industrial development in advanced manufacturing, along with "new energy", as key pillars of development. According to the government, China will see peak carbon emissions before 2030, with zero-carbon industrial parks (of which at least 100 are to be built before 2030) and direct green transmission (direct connections between industry and renewable power to avoid grid congestion) identified as key mechanisms to achieve this.

The goal for energy intensity is lower than in the previous FYPs, set at a 10% reduction in the next five years. It is also no longer a binding target, as it was in previous plans, meaning there is less onus on government bodies and officials to meet the target. According to the government, in the last FYP (2021-2025) China achieved an energy intensity reduction of 16.1% (against a 13.5% target). IEA figures put the reduction of energy intensity in this period at around 7%. This difference can be explained by a change in China's method for calculating energy intensity improvement. From 2022, China began excluding feedstocks and newly added renewable power from its energy consumption calculation. This measure, while promoting further integration of renewable energy, reduces regulatory emphasis on demand-side energy efficiency.

15th Five-Year Plan (2026-2030) vs. 14th Five-Year Plan targets

Target	14th FYP Target (2021-2025)	15th FYP (2026-2030)
Energy intensity (energy/GDP)	Reduce by 13.5%	10% reduction (non-binding target)
Carbon intensity (CO_2/GDP)	Reduce by 18%	17% reduction by 2030
GDP growth	5%	No binding target, growth at "a reasonable rate"
Demand response capacity (% of peak load)	3-5%, with 5% target for provinces with peak-valley spread over 40%	5% for all provinces
Share of non-fossil energy in TES	20% by 2025	25% by 2030
Energy production capacity	4.6 billion tonnes of standard coal equivalent (tce) or 134.8 EJ by 2025	5.8 billion tce or 169.9 EJ by 2030
Energy intensity of public buildings (energy/m^2)	Reduce by 5% vs. 2020	Reduce by 5%
Carbon intensity of building operation (direct emissions/m^2)	*New target*	Reduce by 3%
Industrial energy intensity (energy consumption/unit of value added)	Reduce by 13.5% (certain provinces set higher targets)	Reduce by 10%

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Moreover, the current FYP period marks a turning point in one of China's most significant energy efficiency regulations, the dual energy control mechanism. This mechanism, which has existed for over a decade, sets limits on the energy consumption and intensity of provinces and large enterprises. From 2026, this policy will transform into a dual carbon control system, where total emissions and carbon intensity (CO_2 emissions per unit of GDP) are controlled, while energy consumption and efficiency are no longer directly controlled, although they will still make appearances within efforts to limit carbon emissions.

Finally, in July 2026, China released a complementary Five-Year Plan on carbon peaking. It sets more specific energy targets for 2030, such as a national demand response capacity above 5% of the maximum load and a decrease of 5% in energy consumption per unit of built area of public institutions. The sectoral Five-Year Plan for industry, also released in July 2026, outlines a series of measures to drive efficiency such as increased electrification and greater integration of artificial intelligence (AI).

Policy action in industry has ramped up in 2026, with ongoing measures to electrify transport and buildings

To support the implementation of the Five-Year Plan targets, China released a three-year action plan in June 2026 on energy conservation and carbon reduction in industries including steel, electrolytic aluminium, cement, flat glass, oil refining, ethylene, synthetic ammonia, methanol and coal-fired power. By 2028, the plan aims to cut carbon emissions by 200 million tonnes and deliver 100 million tce (about 2.93 EJ) of cumulative energy savings.

Additional policy action in industry includes lowering the threshold for requiring plants to produce energy management records and energy efficiency audits from 10 000 tce (293 TJ) to 5 000 tce (147 TJ) of annual energy consumption. This expands regulatory coverage from roughly 60% of industrial energy demand to more than 80% as of 2026. In February 2026, a plan was released to drive the development and uptake of energy savings equipment. It sets targets for the share of installed and newly bought equipment that should meet China's Grade 2 efficiency level (equivalent to IE4 Super Premium Efficiency) by 2028. It also pushes for increased integration of AI and grid-interactive upgrades through high-efficiency converters, flexible transformers and smart reactive-power compensation to help equipment better match fluctuating renewable energy supply.

In transport, China is complementing its already very strong electric passenger vehicle penetration (53% of new sales with targets to make this 70% by 2030) by setting strong targets for trucks. A policy announcement in May 2026 called for electric trucks to make up over 40% of new sales and 20% of the overall heavy

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truck fleet (over 12 tonnes) by 2030. This includes an 80% electrification target of fixed-route short-haul transport in key regions (Beijing-Tianjin-Hebei and the Fenwei Plain) accompanied by the buildout of roughly 3 000 charging and battery-swap stations and 30 000 km of "zero-carbon" highway freight corridors.

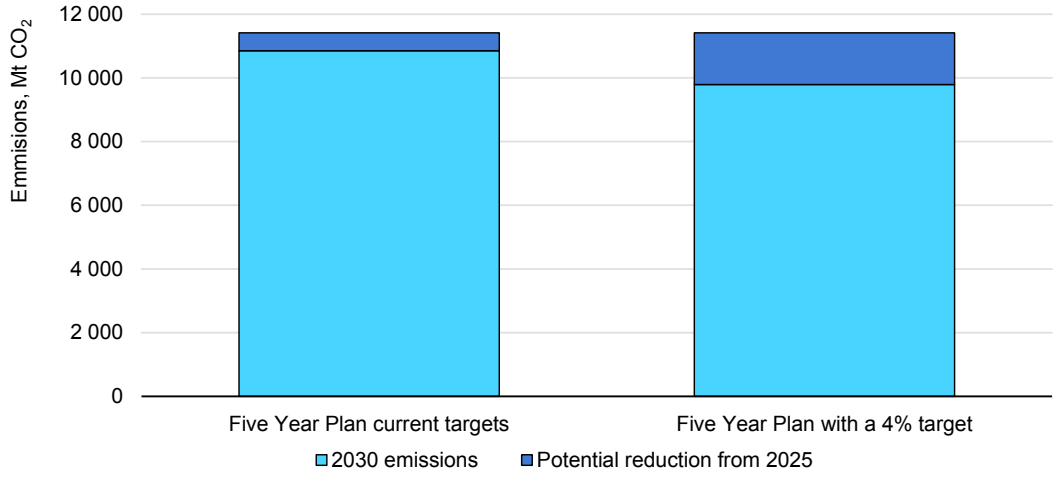
In buildings, China also set a goal for a reduction in direct carbon emissions per unit of floor area, or carbon intensity, of 3% between 2026 and 2030. As China does not include district heating in the calculation of direct emissions, this goal is particularly ambitious and will involve building-level electrification and efficiency.

Stronger intensity targets could triple China's emissions savings in the current Five-Year Plan

Over the previous decades, energy efficiency has been a key driver of China's emissions reductions by moderating energy demand growth and improving energy intensity. It is also one of the main pillars of China's pathway to carbon neutrality. Combined with a cleaner power mix, including the target of 50% non-fossil electricity generation by 2030, stronger energy efficiency improvements could accelerate emissions reductions while also decreasing pressure on the electricity grid by avoiding unnecessary demand.

China's 15th FYP (2026-2030) has set a target of reducing energy intensity by 10% by 2030 from 2025 levels, or an annual compound improvement of 2.1%. If this is achieved, by 2030, CO_2 emissions from fuel combustion could decrease by around 5%. However, if an average annual decrease in intensity of 4% is achieved between 2026 and 2030, in line with progress rates seen in the previous decade, emissions could be reduced by an estimated 14%.

Evolution of Chinese CO_2 emissions, current FYP parameters and enhanced energy intensity parameters (doubling energy efficiency improvement)



IEA. CC BY 4.0.

Sources: IEA analysis with supporting data from IMF (2025), World Economic Outlook 2025 October and UN (2026), Data Portal - Population Division.

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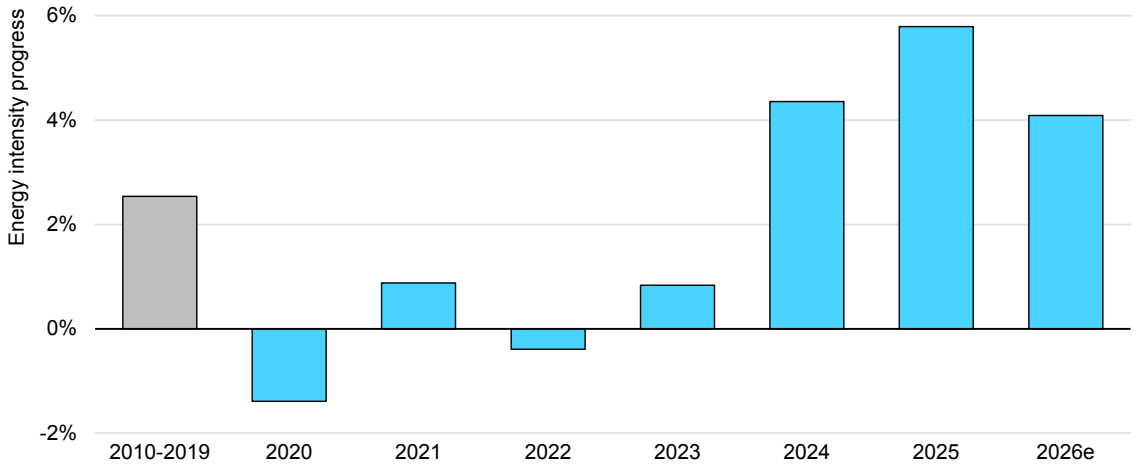
3.2 India

India sustains strong energy efficiency progress amid major shifts in energy demand

India continues to outperform its long-term average rate of energy efficiency improvement. Primary energy intensity is expected to improve by over 4% in 2026, as a result of strong economic growth, expected to reach 7% this year, combined with moderate growth in energy demand. The slowdown in energy consumption was most notable in liquefied petroleum gas (LPG), as households and businesses faced shortages and price hikes as a result of the energy crisis, with many families being forced to change cooking habits and switch to other fuels.

India has continued to expand policies supporting energy efficiency under the National Mission for Enhanced Energy Efficiency. In 2026, implementation of the Assistance in Deployment of Energy Efficient Technologies and Equipment initiative began, providing interest-rate support for loans to micro, small and medium-sized enterprises (MSMEs) investing in efficient equipment. India also advanced implementation of its Carbon Credit Trading Scheme, marking a transition from the flagship Perform, Achieve, Trade programme and creating new incentives for emissions reductions and efficiency improvements in energy-intensive industries. In transport, India approved the next phase of its Corporate Average Fuel Efficiency norms for passenger vehicles. The 2027 standards would tighten fleet-average CO_2 emissions limits, expand regulatory coverage and support further vehicle electrification.

Primary energy intensity improvement, India, 2010-2026e



IEA. CC BY 4.0.

Note: 2026e = estimated values for 2026.
Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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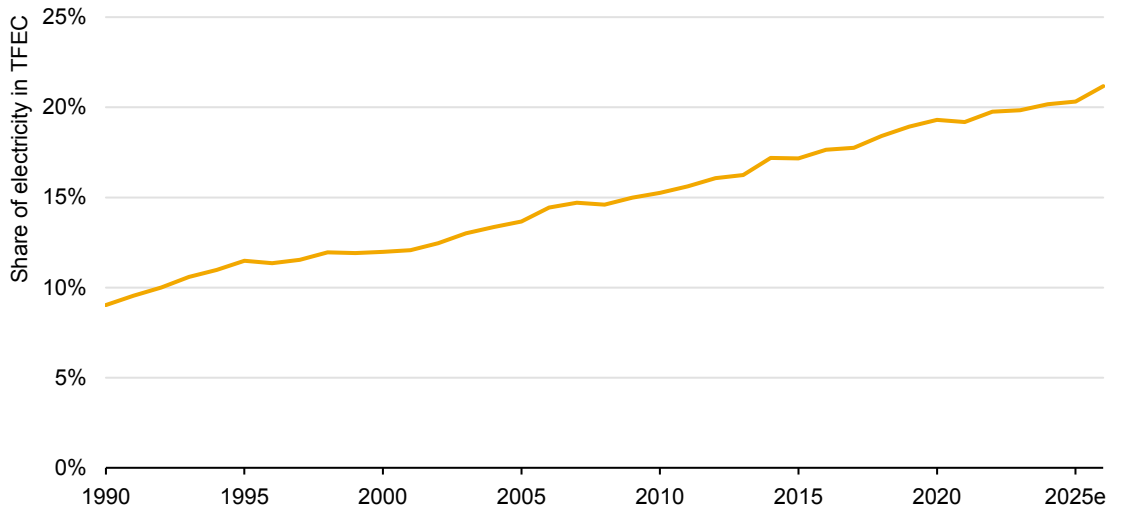
The energy crisis drives immediate conservation measures while reinforcing India's electrification push

In response to the disruption to supplies through the Strait of Hormuz, India introduced short-term measures to address fuel shortages and affordability pressures. Energy conservation measures included promoting remote work, limiting industrial gas use, accelerating the rollout of piped natural gas to reduce demand for LPG, rationing commercial LPG supplies and encouraging public transport for non-essential travel. To ease fuel costs, the government reduced excise duties on gasoline and diesel.

More structurally, the current crisis reinforced momentum for electrification across India's industrial, transport and cooking sectors. In March 2026, daily sales of electric cookstoves on e-commerce platforms rose more than 30-fold, prompting the government to launch an Energy Efficiency Services Limited programme to procure and deploy 500 000 induction cooktops. In transport, electric car sales increased by over 90% year-on-year in the first half of 2026, exceeding 100 000 units.

Fuel supply disruptions also placed pressure on small and medium-sized enterprises (SMEs) across industries in textiles, food processing and glassmaking, which typically operate on low profit margins and face a high share of energy costs in overall expenditure, prompting manufacturers to seek alternatives to imported fuels.

Electrification progress, India, 2010-2026e



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Note: 2025 and 2026 values are estimated, based on IEA (2026), Electricity Mid-Year Update 2026 and Energy Efficiency Progress Tracker, (accessed November 2026)

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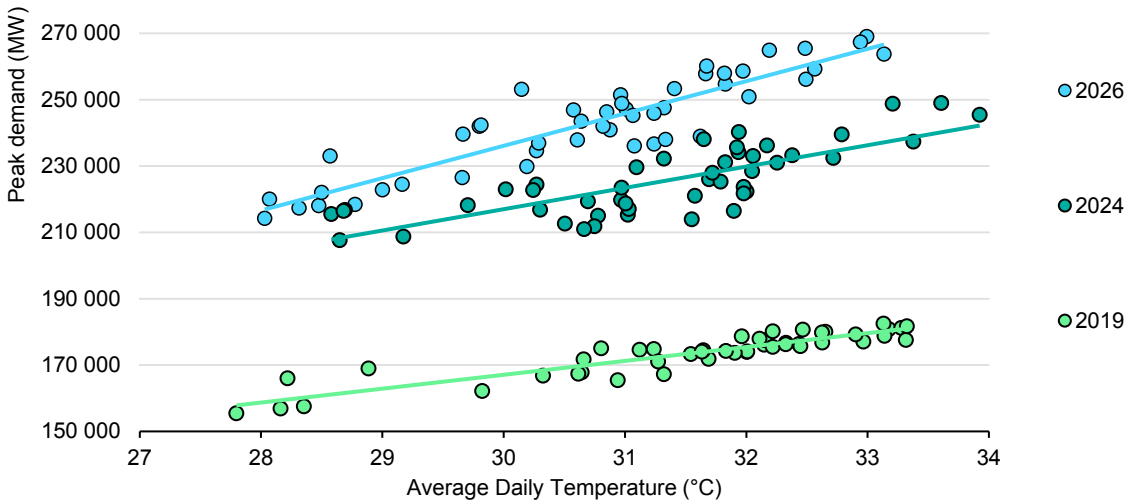
Rising peak demand prompts policy action for demand flexibility

Rapidly growing air conditioner ownership and rising temperatures are pushing India's electricity demand to new peaks. In the last decade, penetration of air conditioners in India has grown from 5% to around 15%, and the market continues to expand, placing increasing pressure on India's power system. Every additional degree of average temperature in 2026 added around 11 GW of peak electricity demand, up from about 7 GW in 2024 and around 4 GW in 2019.

India's cooling challenge is defined by both its scale and its timing. Although electricity demand typically peaks during the daytime in summer, demand rises sharply again at night as households switch on air conditioners, fans and coolers. Ensuring sufficient generation capacity during nighttime peaks, when cooling demand is growing rapidly but renewable electricity output (particularly from solar PV) is low, is emerging as a critical electricity security challenge.

Policy efforts are increasingly focusing on demand-side flexibility to help manage these growing peaks. In 2026, the Ministry of Power proposed amendments to the Electricity (Rights of Consumers) Rules. The proposed rules would enable consumers to receive price signals or financial incentives to shift electricity consumption away from peak periods. Demand flexibility policies are also expanding at the state level. States such as Rajasthan introduced mandatory demand flexibility obligations for distribution companies in 2026, following similar initiatives announced earlier by Maharashtra and Karnataka.

Daily peak electricity demand and average temperature, India, 2019, 2024 and 2026



IEA. CC BY 4.0.

Sources: IEA (2026), Real-Time Electricity Tracker, (accessed 9 November 2026) and IEA (2026), Weather for Energy Tracker, (accessed 9 November 2026).

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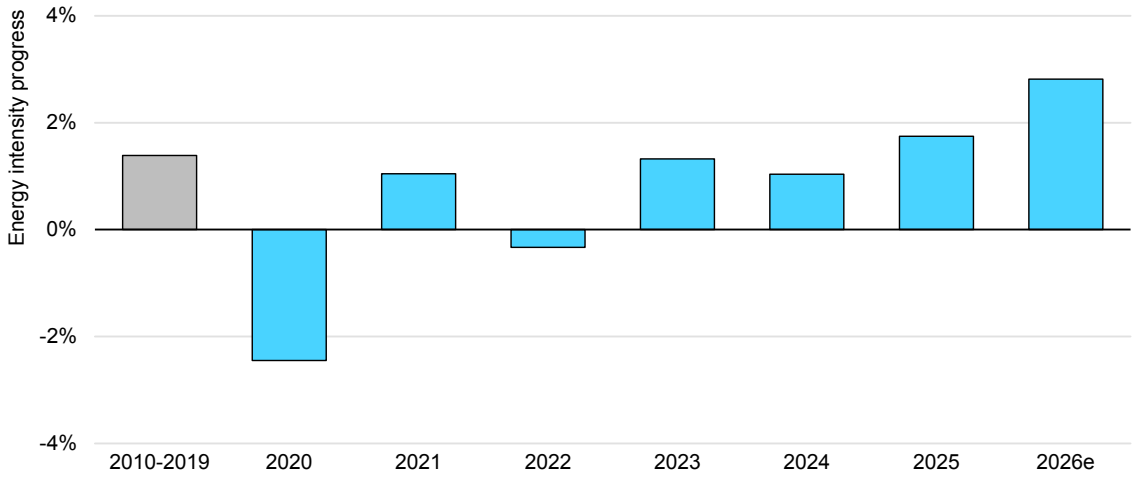
3.3 Southeast Asia

Energy crisis tests region's energy security and reshapes energy demand

Energy intensity progress in Southeast Asia is set to reach 2.8% in 2026. Among the regions most exposed to the current energy crisis, Southeast Asia saw higher fuel prices prompting households and businesses to reduce their demand. The resulting improvement in energy intensity reflects behavioural responses to higher energy costs, such as reduced travel and other energy conservation measures, as well as changes in economic activity.

A number of countries in the region recently introduced policies that updated their energy efficiency targets. In late October 2025, the Association for Southeast Asian Nations (ASEAN) published the ASEAN Plan of Action for Energy Cooperation (APAEC) Phase III. It established the new regional efficiency target to reduce primary energy intensity by 40% by 2030 compared to 2005 levels. This represents an annual energy improvement target of over 4% per year. Indonesia adopted new national efficiency targets in its national energy policy in September 2025, which mark a significant increase in ambition compared with the previous target of 1% energy intensity reduction per year up to 2025. In August 2026, Malaysia launched its National Energy Efficiency Policy and Action Plan 2026-2035, replacing the previous 2016-2025 plan and setting a target to reduce energy demand by 11.6% by 2035 relative to a business-as-usual projection. Most ASEAN countries have set energy intensity progress targets, most generally more ambitious than current trends.

Primary energy intensity improvement, Southeast Asia, 2010-2026e



IEA. CC BY 4.0.

Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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Southeast Asia reacted quickly to the crisis, taking a range of measures and strengthening long-term policies

Southeast Asia has been particularly hard hit by the 2026 energy crisis due to its heavy reliance on imported oil and gas from the Middle East, with much of these supplies transiting through the Strait of Hormuz. Before the crisis, around 60% of the region's crude oil imports and one-third of its natural gas imports came from the Middle East. Countries in Southeast Asia were among the fastest globally to respond to the crisis, with all ASEAN member states having taken at least one emergency policy action by the end of March 2026. Short-term emergency measures implemented across the region to reduce demand-side energy consumption in 2026 varied, but awareness campaigns and policies focusing on transport, cooling and remote work stood out.

Selected demand-side and consumer support measures implemented by Southeast Asian governments as a response to the energy crisis

BRUNEI DARUSSALAM
- Fuel purchase control

CAMBODIA
- Teleworking*
- Reduce travel*
- Encourage air-conditioning limits*
- Ask public to conserve energy
- Reduce energy taxes

INDONESIA
- Teleworking*
- Reduce travel*
- Encourage office building energy saving*
- Fuel subsidies and purchasing limits

LAO PDR
- Teleworking*
- Rotating shifts*
- 3-day school week
- Promote public transport
- Ask public to conserve energy
- Fuel subsidies
- Reduce energy taxes

MALAYSIA
- Teleworking*
- Reduce travel*
- Encourage office building energy saving*
- Ask public to conserve energy
- Permit more direct flight paths
- Encourage energy efficient technology*
- Encourage cooler work attire*
- Targeted support for businesses

MYANMAR
- Teleworking*
- Even-odd licence plate system
- Fuel rationing

THE PHILIPPINES
- Teleworking*
- Reduce travel*
- 4-day work week*
- Reduce fuel consumption by 10%*
- Encourage air-conditioning limits*
- Fuel subsidies and targeted support
- Reduce energy taxes

SINGAPORE
- Promote public transport and carpooling
- Ask public to conserve energy
- Encourage air-conditioning limits, fan use
- Delay jet fuel levy
- Cash relief and targeted support

THAILAND
- Teleworking
- Carpooling
- Reduce travel*
- Air-conditioning limits*
- Fuel subsidies and targeted support
- Price caps

TIMOR-LESTE
- Ask public to conserve energy
- Price cap

VIET NAM
- Teleworking
- Carpooling
- Reduce travel*
- Fewer domestic flights
- Promote public transport
- Fuel rationing
- Fuel subsidies
- Reduce energy taxes

Selected demand-side and consumer support measures implemented by Southeast Asian governments during the Middle East conflict, as of 25 August 2026
* Denotes a measure targeted towards or taken by government institutions or officials
Demand restraint and energy conserving measures
Consumer support measures

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Source: Adapted from IEA (2026), Southeast Asia Energy Outlook.

Most countries in the region experienced higher gasoline and diesel prices this year, leading many governments to adopt supply-side and consumer support measures intended to shield citizens from the price shock. Some countries targeted fiscal support to the most affected citizens during the crisis, including Singapore, which gave cash transfers to taxi drivers and temporary help to cover the cost increases for essential bus services, while also encouraging car-pooling and public transport use to reduce energy consumption.

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In the context of the crisis, several governments looked to accelerate energy efficiency policies able to deliver long-term energy savings and enhance energy security, with the electrification of vehicles an important theme. Viet Nam's Prime Minister issued a directive requesting government ministries, sectors, localities, businesses and the entire society to implement tasks and solutions that together would strengthen energy saving, promote the energy transition and develop electric transport. Indonesia established a new taskforce for accelerating the energy transition, with one of its objectives being to accelerate the conversion of gasoline-powered vehicles into EVs within the next three to five years. Thailand allocated approximately USD 6 billion to its Energy Transition programme, including support for the transition to EVs.

Selected structural measures in Southeast Asia in 2026, by country

Country	Structural measure
Cambodia	Reduce import tariffs on electric vehicles, electric stoves and appliances.
Indonesia	Accelerate the conversion of gasoline-powered motorcycles to electric-powered, and the deployment of electric stoves to reduce LPG consumption.
Lao PDR	Suspend imports of ICE cars; lower fees and taxes on electric vehicles; promote charging infrastructure; encourage uptake of electric trucks; plan to better connect rapid bus transit system with train stations and airports.
Philippines	Intensify energy audits across government offices.
Singapore	Expand energy efficiency grant to all sectors.
Thailand	Provide low-interest loans for electric vehicles.
Viet Nam	Set deadline to end sale of 20-60 watt incandescent light bulbs; reduce special consumption tax on electric vehicles.

Efforts to enhance cooling energy efficiency are deepening as cooling demand ramps up

In August 2026, parts of the tropical Pacific experienced record-high sea surface temperatures as El Niño became firmly established. Forecasts indicated that the event would become very strong, increasing the likelihood of above-normal temperatures across much of Southeast Asia. Some governments in Southeast Asia have recently launched proactive initiatives designed to protect citizens from extreme heat, while helping to manage growing cooling electricity demand. For example, Singapore plans to activate more than 300 cooling centres during heatwaves, while its National Heat Resilience Strategy promotes urban planning, building design and efficient technologies to manage cooling demand.

Over the longer term, Southeast Asia's rapidly growing demand for space cooling will make the efficiency of buildings and space cooling technologies increasingly important. With demand for ACs accelerating, there is an opportunity for countries to mitigate increasing energy demand with stringent efficiency standards. To manage this growing demand, ASEAN countries are strengthening regional co-

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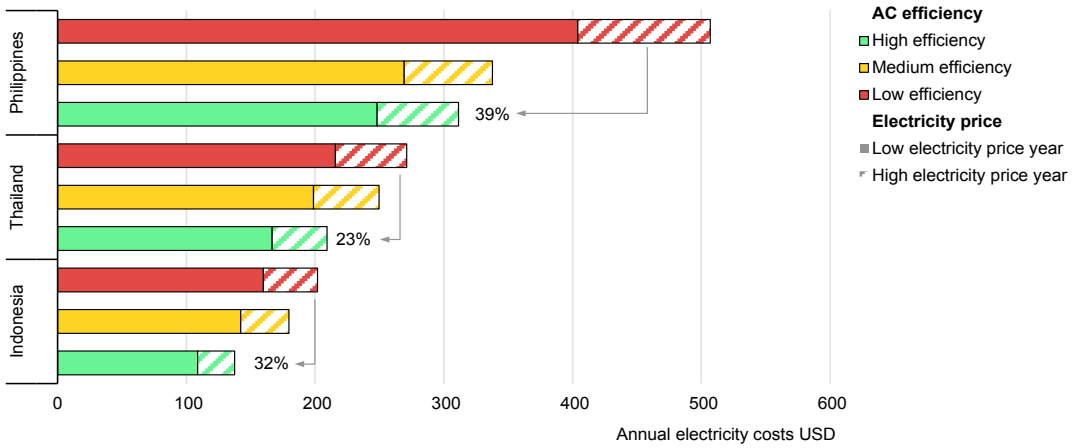
operation on cooling efficiency. In April 2026, the ASEAN Centre for Energy and the United Nations Environment Programme launched a passive cooling roadmap that recommends harmonised regional standards for building envelope design, façade materials, natural ventilation and thermal performance. In parallel, ASEAN has established a high-level regional cooling taskforce and developed a regional strategy to accelerate the adoption of energy-efficient room air conditioners.

Comparative AC energy labelling and minimum energy performance standards (MEPS) are in place for most ASEAN countries. ASEAN has set a regional goal to harmonise room air conditioner MEPS by 2030 at a level that, as of 2026, is among the most ambitious globally. Singapore recently updated its MEPS, with mandatory requirements coming into full effect on 1 April 2026. These are regionally the most ambitious, meeting and exceeding the regional goal. Other countries are also strengthening requirements. Malaysia's increased AC MEPS took effect this year, and levels for <4.5 kW models will reach the regional goal by 2030. Thailand upgraded its standards for ACs in 2026, raising the MEPS, expanding coverage and strengthening energy labelling requirements.

The benefits of stronger standards can be substantial. IEA analysis found that high-efficiency models in Southeast Asia do not necessarily cost more than average models, while delivering substantial energy cost savings. In the Philippines between 2015 and 2025, a typical high-efficiency mid-sized unit could have reduced annual household electricity costs by USD 156-196 (about 4% of the average annual income). This highlights the important role of efficient cooling technologies in protecting households from energy price shocks, and the role of policies to help consumers choose high-efficiency models.

Annual electricity costs for a mid-sized air conditioner for historic high and low electricity prices in the Philippines, Thailand, and Indonesia



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Notes: Efficiency groupings are defined as the top, middle and bottom thirds of country-specific efficiency factor for models available in retailers. Medium sized is defined as 2.5-4.0 kW cooling output. High/low electricity price years are taken from 2015 to 2025 and are 2017/2015 for Indonesia, 2025/2020 for the Philippines and 2023/2016 for Thailand.

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3.4 Oceania

Many countries in Oceania took action to save fuel and protect consumers

Countries in Oceania were hit hard by the 2026 energy crisis, as they are highly dependent on oil imports from the Middle East. In response to this, many countries took emergency policy action on the demand side.

For example, Australia, Fiji and Nauru all encouraged citizens to reduce their fuel use where possible. Australia did this through its Every Little Bit Helps campaign, highlighting actions that consumers can take immediately to conserve energy, but also informing them how this contributes to national fuel security. New Zealand launched the Stretch Every Tank campaign to help the public save money with more efficient driving. Meanwhile, the government in the Marshall Islands reduced daily working hours for civil servants to save energy, limited use of government vehicles and declared a state of emergency on the island, something Tuvalu did as well.

Australia, the Solomon Islands and Vanuatu all reduced fuel tax or increased fuel subsidies to protect consumers, while Papua New Guinea implemented a retail price cap for gasoline, diesel and kerosene. Meanwhile, several countries, including Australia, Fiji and New Zealand also introduced targeted support measures for the most vulnerable groups, including vulnerable households, farmers and transport operators.

Demand-side and consumer support measures implemented by governments as a response to the energy crisis, by type, Oceania, 2026

Country	Energy conservation	Consumer support	Structural policies
Australia	●	●	●
Fiji	●	●	
Marshall Islands	●		
Nauru	●		
New Zealand	●	●	
Papua New Guinea		●	
Solomon Islands		●	
Tuvalu	●		
Vanuatu		●	

Source: IEA, Energy Crisis Policy Response Tracker, (accessed 9 November 2026).

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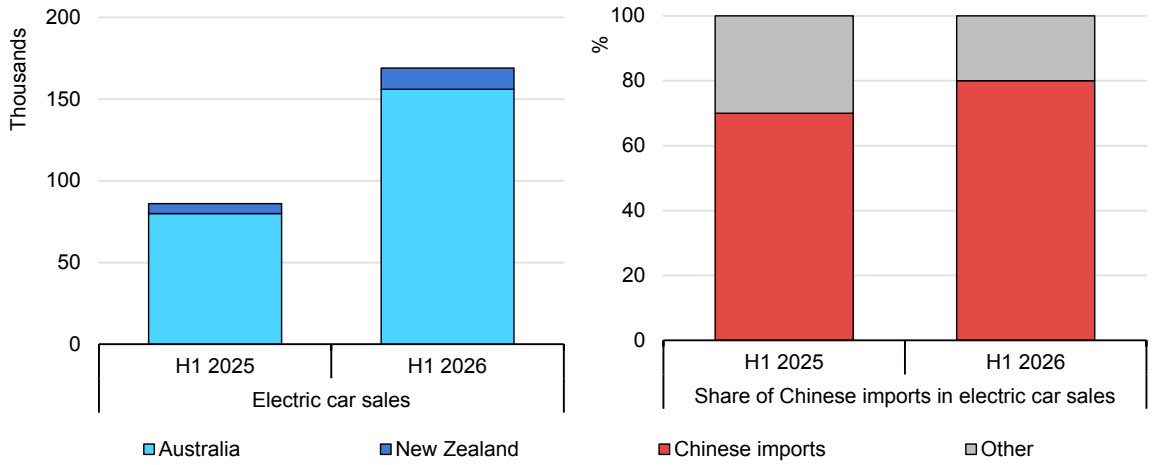
High gasoline prices in 2026 drive consumers in Australia and New Zealand towards electric vehicles

Gasoline prices rose sharply across Oceania following the crisis, with consumers in Australia, for instance, paying over 34% more for gasoline at the pump. At the same time, electric car sales doubled in the first half of 2026 in both Australia and New Zealand compared to the first half of 2025, indicating that consumers shifted towards electric cars, driven by higher fuel prices and the availability of more affordable models, notably from China. In Australia, EV sales held nearly 36% of the market in August, with battery electric vehicles hitting record sales of over 27 000 that month.

The Australian government also introduced new policy support for electric vehicles in its response to the crisis, stepping up efforts to roll out public EV charging stations, maintaining electric vehicle tax benefits, announcing a zero-emissions heavy freight transport project, and funding electrification of the Australia Post vehicle fleet. Australia also announced the expansion of projects trialling household adoption of electric vehicle-to-grid technology and smart charging, bringing total funding to USD 11.8 million and enabling increased participation.

Smaller islands in the Pacific region are also taking policy steps to promote electric vehicle rollout. For example, Solomon Islands announced an Electric Mobility Project in March 2026, and Fiji is working on a new strategy to encourage EV uptake, while companies in Papua New Guinea launched a pilot to introduce the country's first electric vehicle programme.

Electric car sales, and share of Chinese imports in electric car sales, Australia and New Zealand, H1 2025- H1 2026



IEA. CC BY 4.0.

Note: H1= first half of the year.
Source: IEA (2026), Electric Car Markets in a Time of Uncertainty.

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3.5 Europe

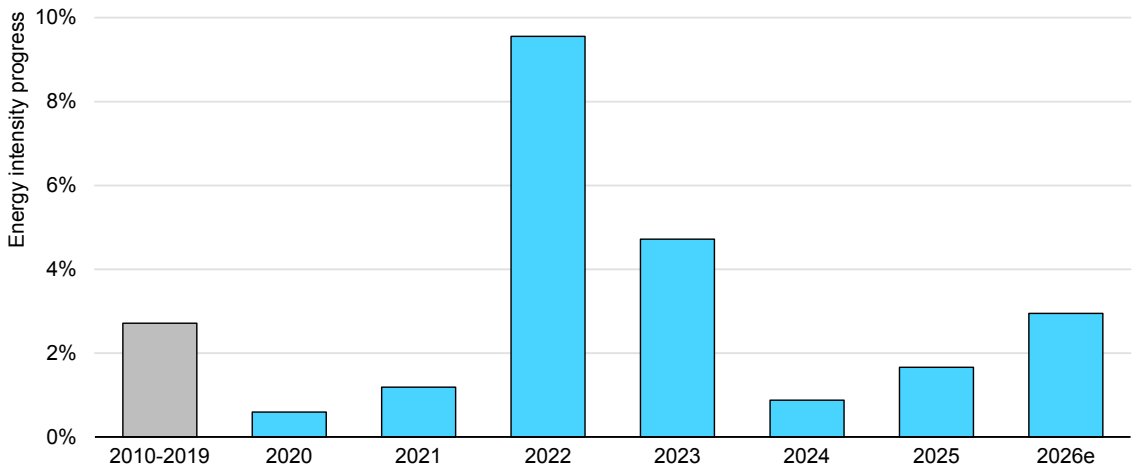
Europe sees an uptick in efficiency progress as energy demand falls and economic growth holds up

Europe's energy efficiency improvements continued in 2026, although at a slower pace than during the 2022 energy crisis that followed Russia's full-scale invasion of Ukraine. Primary energy intensity is set to improve by almost 3% in 2026, slightly above the long-term average seen over 2010-19. Behavioural changes around transportation, an acceleration in electrification and efficiency investment supported progress across the region this year.

The energy crisis resulted in energy demand falling by about 1.5%, despite positive economic growth around the region. In the first half of the year, Germany saw a 1.9% drop in energy demand, largely driven by diesel, which fell 6%, while the economy grew about 0.9%. In the United Kingdom, primary energy consumption fell by around 2% in the first half of the year, with diesel demand falling 5.5% in the second quarter, while GDP expanded, partly sustained by spending on AI.

This happened as battery electric vehicles sales grew by about 40%, while sales of pure gasoline and diesel vehicles dropped by over 15% in the region. Heat pump adoption also accelerated during the first months of the year. Alongside these trends, EU member states increasingly focused on implementing recently adopted measures following the transposition of the revised Energy Efficiency Directive, the bloc's flagship efficiency policy.

Primary energy intensity improvement, Europe, 2010-2026e



IEA. CC BY 4.0.

Notes: 2026e = estimated values for 2026.
Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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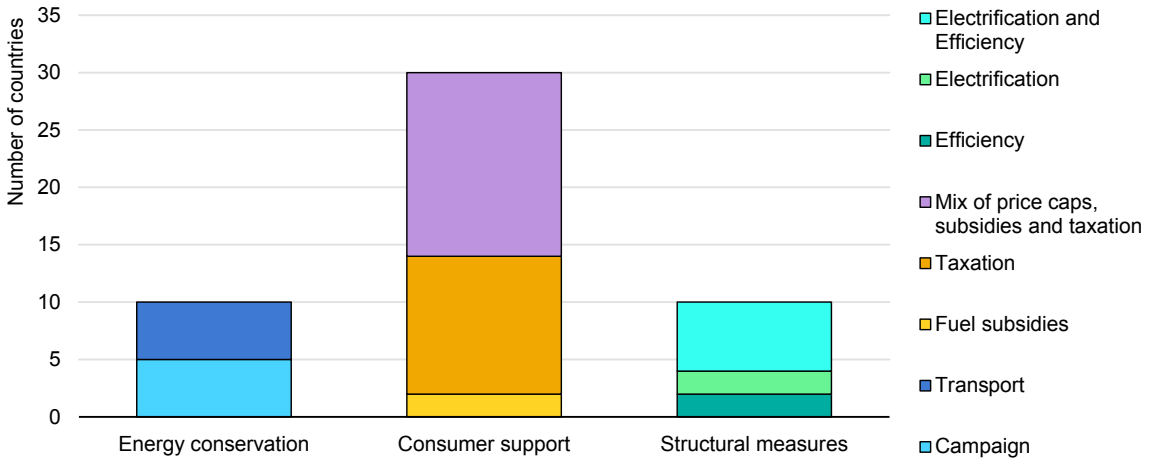
Consumer support measures outweighed energy conservation efforts in Europe

Although most European countries depend heavily on imported fuels, their import portfolios are generally diversified and less reliant on Middle Eastern suppliers. As a result, there was less of an immediate supply concern compared to other regions, such as Southeast Asia. In Europe, 10 countries took energy conservation actions in 2026, while 30 countries introduced energy support measures to protect consumers. The majority came in the form of reductions in fuel taxes, as in Germany, Hungary, Norway and Poland. This has come at significant fiscal cost to governments, USD 18 billion, on top of extra fuel import costs of around USD 53 billion.

The European Commission responded to the crisis by announcing its AccelerateEU plan, which aimed to co-ordinate the response across EU member states. This included setting up the Middle East Crisis Temporary State Aid Framework to address the effects of the crisis on highly exposed sectors such as agriculture, fishery, transport and energy-intensive industries. The European Commission also announced its Electrification Action Plan, including an indicative electrification target with the explicit aim of reducing dependency on imported fuels. Several European countries also took longer-term policy measures. For example, the Netherlands introduced extra funds for energy efficiency improvements for vulnerable households, the United Kingdom ramped up its Warm Homes Plan, and France published a new National Plan for the Electrification of End-Uses, containing 22 policy actions to enhance electrification.

Demand-side policy response to the energy crisis in Europe, by type, 2026



IEA. CC BY 4.0.

Source: IEA (2026), 2026 Energy Crisis Policy Response Tracker, (accessed 9 November 2026).

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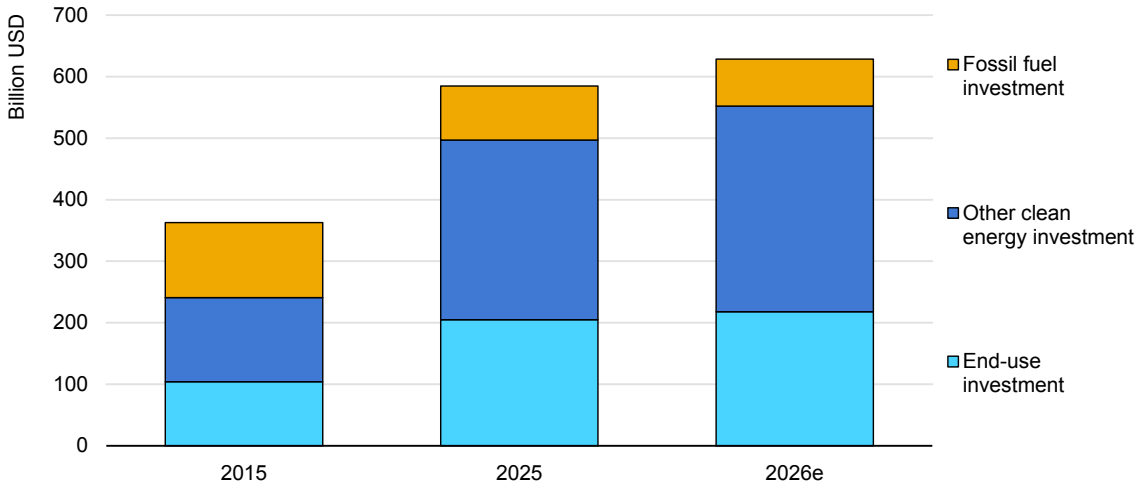
Europe ramps up both public and private efficiency investment in 2026

End-use investment in Europe is estimated to be around USD 218 billion in 2026, representing around 35% of total energy investment in Europe in 2026. Since 2015, end-use investment has more than doubled in the region and is expected to grow around 6% from 2025 to 2026.

In 2026, the European Commission published an Energy Efficiency Financing Package, as part of its broader 2026 Clean Energy Investment Strategy. It includes an assessment of the current state of public energy efficiency financing in the European Union and recommendations on how to attract more private investment and leverage capital through one-stop shops. The USD 658 billion NextGenerationEU Recovery and Resilience Facility was also implemented in 2026, with 37% of its funds going to climate policies, such as building renovations, heat pump deployment and upgrades to social housing.

European countries also announced new spending packages on energy efficiency in 2026, partly in response to the current crisis. Most notably, Spain presented a USD 10 billion social climate plan to improve the efficiency of housing and mobility. Around USD 5 billion is directed towards efficient buildings, including the construction of new buildings according to high energy performance standards and renovation of existing buildings to improve their efficiency. The other USD 5 billion will go to the transport sector, including the decarbonisation of road transport, enhancing public transport, promoting shared and active mobility, and enabling modal shift.

Energy investment, Europe, 2015-2026e



IEA. CC BY 4.0.

Note: 2026e = estimated values for 2026.
Source: IEA (2026), World Energy Investment.

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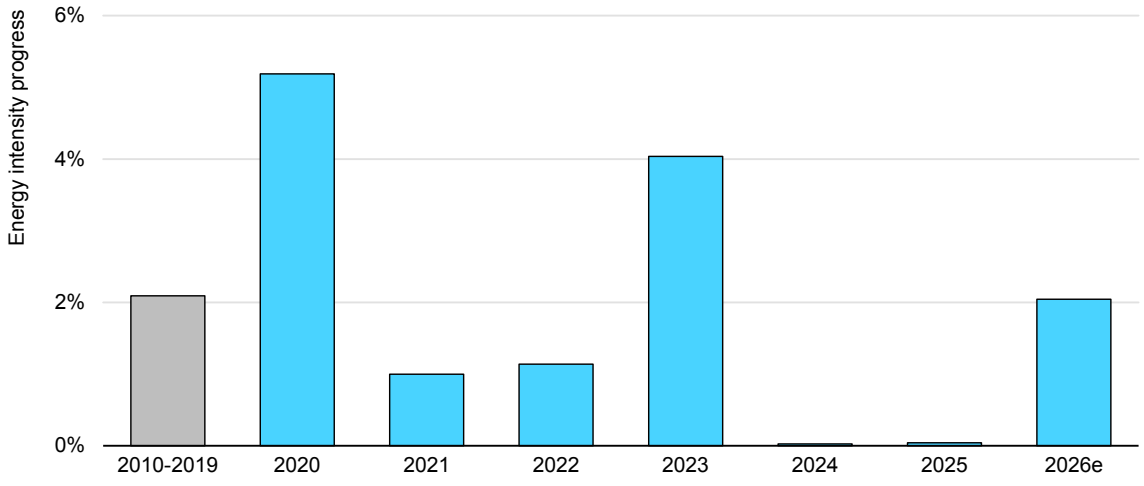
3.6 North America

Energy intensity progress rebounds in 2026 amid rising electricity demand and divergent policy signals

Energy efficiency progress in the United States, Canada and Mexico accelerated in 2026, with primary energy intensity improving by 2%, just below long-term averages. In 2026, oil demand remained relatively robust, and electricity consumption increased further, driven by industrial activity and the rapid expansion of data centres, which are expected to account for around half of US electricity demand growth through 2030. AI-related infrastructure investment also boosted GDP growth, contributing to the intensity progress.

Policy developments diverged sharply. In the United States, federal policy shifted away from efficiency, with the government proposing to weaken a range of equipment efficiency standards and change the process for setting new ones. Subnational policy action continued, including New York State's implementation of around USD 1 billion per year in efficiency and building electrification programmes for 2026 to 2030. In Canada, affordability concerns increasingly shaped efficiency policy, with its Greener Homes Affordability Program expanding to four new provinces and directing around USD 360 million towards no-cost retrofits. Utilities also continued to invest in efficiency in 2026, including through BC Hydro's USD 715 million Power Smart 2.0 plan, adding to major investments by Hydro-Québec and Ontario. Mexico's updated MEPS for air conditioners and electric motors, to the IE4 level, entered into force, along with strengthened energy management and reporting systems for large users.

Primary energy intensity improvement, North America, 2010-2026e



IEA. CC BY 4.0.

Notes: 2026e = estimated values for 2026. North America includes the United States, Canada and Mexico.
Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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The energy crisis increased fuel price pressures but prompted limited new energy efficiency measures

The current conflict in the Middle East and disruption to energy flows through the Strait of Hormuz put upward pressure on global oil and gas prices, but the impact on North America was more mixed than in import-dependent economies. Total oil consumption in the region remains flat in 2026, as a decline in gasoline use is partly offset by an equivalent expansion in LPG/ethane and supply increases year-on-year, with oil production from the United States reaching record highs.

Nevertheless, in the United States, gasoline prices rose sharply during the initial phase of the crisis, reaching above USD 4.50 per gallon in May, before falling back below USD 4 in June as expectations of a reopening of the Strait improved, and reaching nearly USD 4.50 again towards September. Despite this, it has not resulted in a meaningful reduction in activity. Meanwhile, diesel prices reached all-time highs in September amid the ongoing conflict.

Policy responses focused primarily on protecting consumers and businesses from higher fuel costs rather than accelerating energy efficiency. Mexico renewed voluntary price agreements with fuel retailers in April and again in August, agreeing to maintain a maximum retail price of around USD 1.25 per litre for gasoline and around USD 1.40 for diesel. Canada suspended the federal excise tax on gasoline, diesel and aviation fuels and later introduced targeted support to help airlines facing elevated jet fuel costs. In the United States, policies tended to be introduced at the state level, including Georgia and Indiana, which suspended fuel taxes in response to higher prices. While these measures reduced the immediate burden of the crisis, lower fuel prices also weakened incentives to conserve energy.

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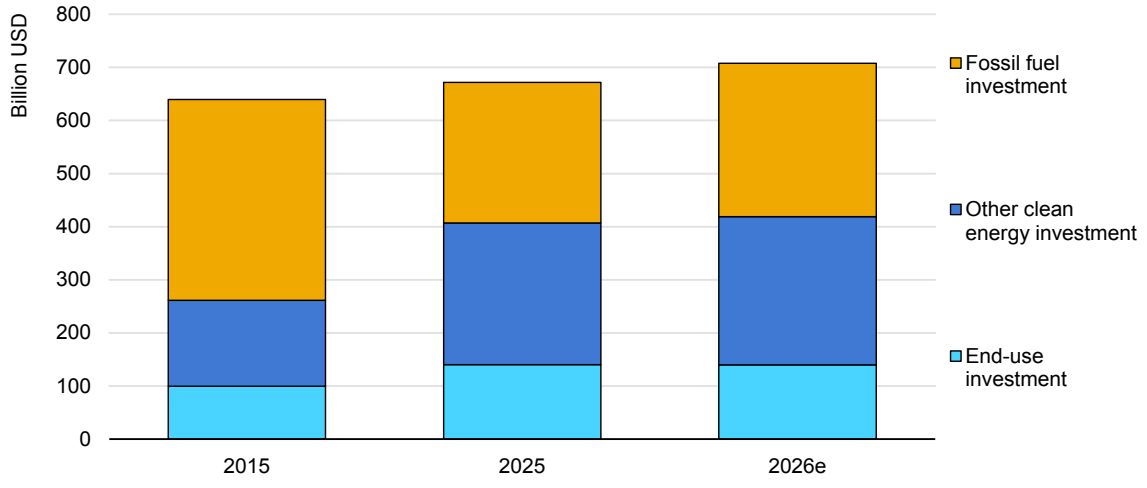
End-use investment remained broadly stable in 2026

End-use investment in North America is estimated at around USD 140 billion in 2026, representing 20% of total energy investment. While investment has grown by around 40% since 2015, this growth has now stalled, with end-use investment in 2026 at levels similar to those of 2025. While households and businesses remain the main sources of end-use investment, high upfront costs continue to constrain efficiency investment, prompting governments and public financial institutions to increasingly consider innovative financing models to mobilise private capital, particularly in the buildings sector.

In Canada, the Canada Infrastructure Bank is mobilising private capital for building retrofits. In May 2026, it concluded a USD 70 million investment agreement with a private partner, using a performance-based model in which retrofit costs are repaid through energy savings, building on a separate USD 70 million partnership with Scotiabank, launched in 2025, to provide low-cost retrofit financing. In the United States, state-level green banks and Commercial Property Assessed Clean Energy (C-PACE) programmes continue to provide long-term financing for efficiency and electrification projects. Latest data show that the US C-PACE market reached nearly USD 13.5 billion in cumulative financing by 2025. In Mexico, the Eco-Crédito Empresarial Masivo programme, operated by the Mexican Energy Saving Fund with the development bank NAFIN, was incorporated into the government's MSME credit-access strategy in September 2026, with financing for up to around USD 104 000 for high-efficiency equipment and USD 52 000 for distributed solar PV.

Energy investment, North America, 2015-2026e



IEA. CC BY 4.0.

Note: 2026e = estimated values for 2026. Other clean energy investment includes low-emissions power, clean energy supply, and grids and storage.

Source: IEA (2026), World Energy Investment.

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3.7 Central and South America and the Caribbean

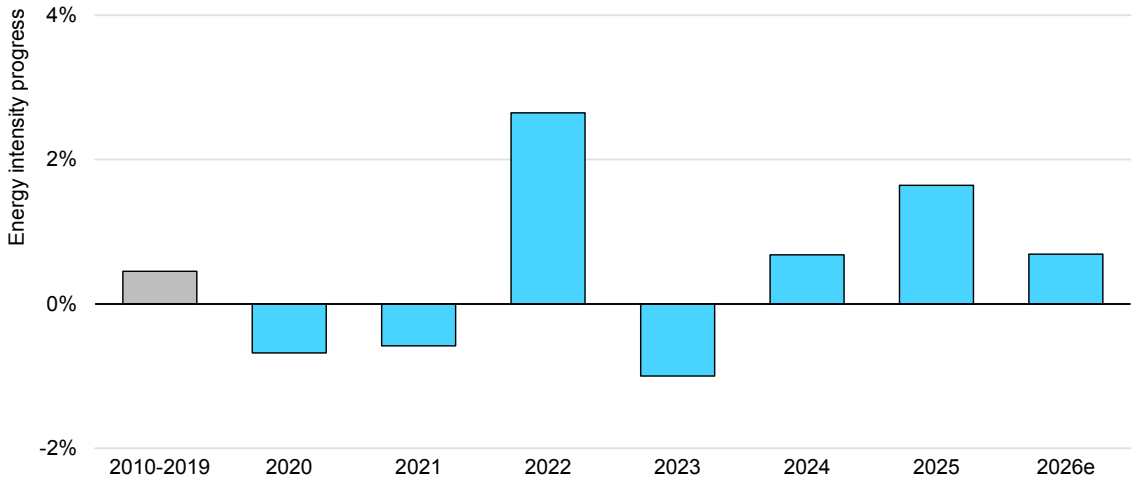
Efficiency progress slows in 2026 as policy implementation remains uneven

Energy efficiency progress in Central and South America and the Caribbean slowed notably in 2026, with primary energy intensity improving by 0.7%, compared with 1.6% in 2025. This year's low intensity improvement is the result of subdued economic growth paired with lower impact from and a more limited response to the current energy crisis compared to other regions. This reflects its much lower reliance on oil imports from the Middle East and the weight of Brazil (which accounts for about half of the energy demand in the region), where oil consumption continues to expand. Overall, oil demand in the region is expected to increase slightly, in contrast to global trends.

However, energy efficiency policy continued gaining momentum in 2026. Advances include Brazil's mandatory building-efficiency indices for public buildings, Chile's new thermal regulation and vehicle efficiency standards entering into force, and updated AC regulations in Argentina, Brazil and Colombia.

Policy activity is also shifting from broad commitments to implementation and capacity building. Brazil is supporting SMEs through the PotencializEE programme, and Barbados's Energy Transition and Investment Plan links efficiency to investment planning, lower fuel imports and energy security.

Primary energy intensity progress, Central and South America and the Caribbean, 2010-2026e



IEA. CC BY 4.0.

Note: 2026e = estimated values for 2026.
Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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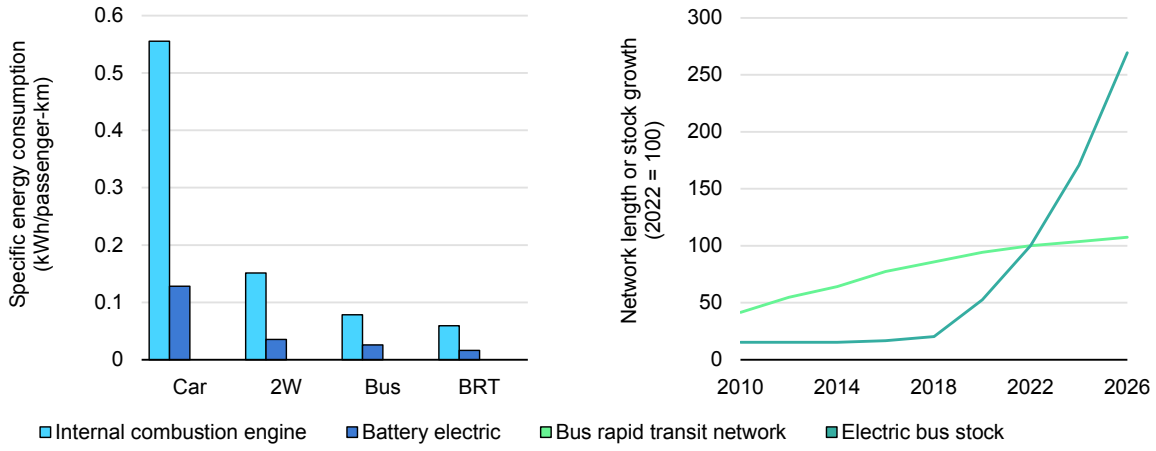
The region sees renewed momentum for bus rapid transit amid the 2026 crisis

The 2026 energy crisis exposed diesel market vulnerabilities, leaving some countries in the region at risk of oil price spikes due to reliance on oil for transport and dependence on fuel imports. This is significant for urban transport: diesel remains central to bus operations, so price increases can raise operating costs, strain fare-support mechanisms and reduce the fiscal space available for longer-term public transport investment.

Early signs in 2026 suggest that countries and cities are increasingly looking towards transport systems that reduce overall oil dependence. Montevideo, Uruguay, explicitly chose a bus rapid transit (BRT) system for its lower costs and greater flexibility. Several other cities are advancing energy efficiency through their plans for BRT, including Salvador, Goiânia and Rio de Janeiro in Brazil, Callao, Lima, and Trujillo in Peru, and Bogotá in Colombia.

The region has been the most successful in implementing BRT systems, more than doubling the network length between 2010 and 2020. Today, it leads in the number of cities served and accounts for around 60% of global BRT daily passengers. Over this period, transport emissions in the region grew by just 3%, compared with the global average of 16%. Yet, bus electrification has recently outpaced BRT network expansion, suggesting that electrification is advancing faster than the rollout of the high-capacity corridors needed to maximise its benefits in energy security, efficiency, and accessibility.

Efficiency of passenger transport (left), and growth in the bus rapid transit network and electric bus stock in Central and South America and the Caribbean, 2010-2026 (right)



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Notes: BRT= bus rapid transit. 2W= two-wheeler. Values for car, motorcycle and bus fuel economy are from IEA (2026), Global EV Outlook 2026. BRT diesel fuel economy is from Moeve and electric from Mercedes-Benz. Average occupancies used are 1.25 for cars, 1.35 for 2W and 100 for bus, and BRT, equal to approximately 50% capacity factors for bus and 70% for BRT. Network length data come from BRT Data, with electric bus stock data from E-Bus Radar.

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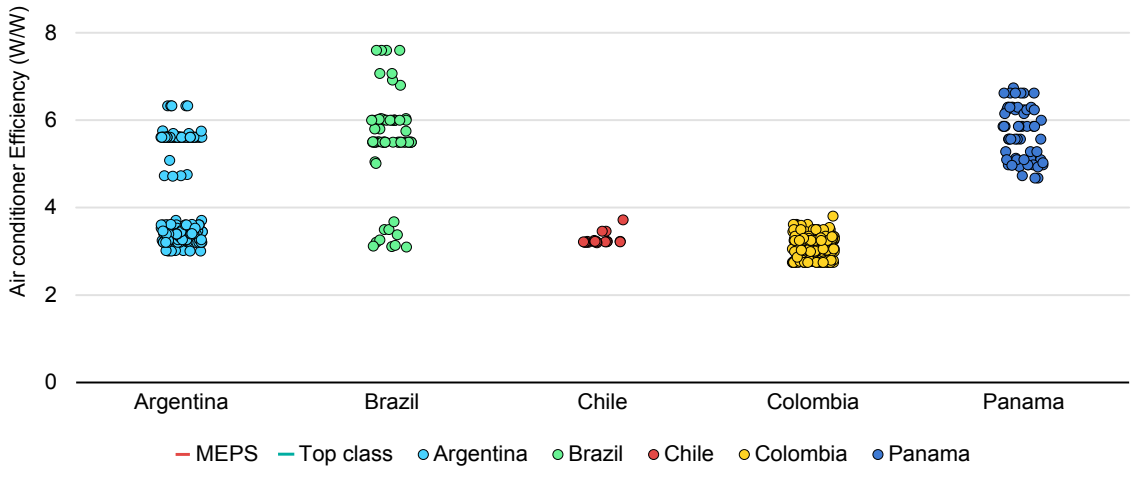
Air conditioner ownership is rising, but efficiency levels differ widely across countries due to varying MEPS

Like other regions in the world, Central and South American and Caribbean countries are experiencing rising temperatures and more frequent and intense heatwaves, turning space cooling into a major energy, health and resilience challenge. Additional energy demand for space cooling could be reduced by enforcing stronger building energy codes and passive cooling measures, helping keep buildings comfortable with less reliance on mechanical cooling. However, average compliance with energy performance requirements in building codes remains around 11% across the region.

In 2025, Brazil, Chile and Colombia strengthened passive cooling requirements in their building codes, and the Caribbean Community (CARICOM) is reviewing the existing Regional Energy Efficiency Building Code and the Regional MEPS for buildings across the CARICOM region. Cooling demand is still emerging from a comparatively low base, which means the region has a major opportunity to shape the market before inefficient technologies become locked in. Only around 15% of households in Central and South America and the Caribbean currently own an air conditioner, but ownership is expected to quadruple by 2050.

Argentina, Brazil and Colombia updated their MEPS for air conditioners in 2025 and 2026, but across the region stringency remains well below average efficiency levels. Without strong efficiency policies, inefficient equipment could be embedded for decades, raising electricity bills and increasing network stress and vulnerability.

Efficiency ratings of available air conditioner units in selected countries, 2023-2026



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Notes: MEPS = minimum energy performance standards. Top class = level of energy efficiency required to reach the top efficiency class in the national labelling scheme. Data was collected in the period of 2023 to 2026. Efficiency levels reflect national regulations at the moment of data collection. For Panama, two MEPS levels are indicated (lower value for fixed-speed models, higher value for inverter models), and no top class is shown, as the scheme used does not have classes.

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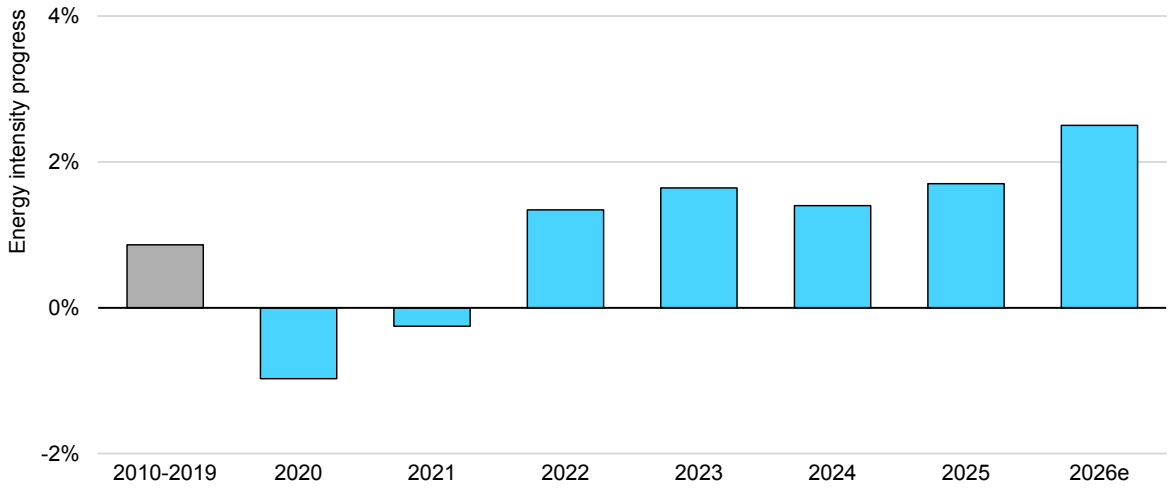
3.8 Africa

Energy efficiency continues to improve in 2026, while policy becomes more regionally co-ordinated

Energy intensity gains are set to continue in 2026, with primary energy intensity projected to improve by 2.6%, above the 2025 improvement rate, showing an acceleration relative to the average over the previous decade.

Between 2025 and 2026, efficiency policy in Africa increasingly shifted towards a co-ordinated continental approach, spearheaded by the African Energy Commission of the African Union. The operationalisation of the African Energy Efficiency Alliance, the first African Energy Efficiency Conference and the launch of the Africa Energy Efficiency Facility strengthened political commitment, regional collaboration and efforts to mobilise investment for efficiency projects. This growing regional momentum is also reflected in national policy developments. In Zimbabwe, a draft National Energy Efficiency Strategy and Action Plan was finalised following stakeholder consultations, while Madagascar's National Energy Efficiency Strategy and Action Plan was formally validated. In East Africa, Kenya adopted the Energy Management Regulations 2025, while also currently updating its National Energy Efficiency and Conservation Strategy. Uganda adopted the Energy Efficiency and Conservation Act 2026, which includes provisions for energy management, energy audits, minimum energy performance standards and appliance labelling. Similarly, in Senegal, stakeholders convened to discuss updates to the National Energy Efficiency Strategy and Action Plan.

Primary energy intensity improvement, Africa, 2010-2026e



IEA. CC BY 4.0.

Note: 2026e = estimated values for 2026.
Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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The energy crisis exposes differing vulnerabilities among oil-importing and oil-producing economies

The 2026 oil shock has had uneven impacts across African economies. Oil-exporting countries benefited from stronger export revenues and, in some cases, increased interest in African crude as buyers sought alternatives to disrupted Middle Eastern supplies. However, these gains were limited in countries that lacked sufficient refining capacity and continued to import refined petroleum products at higher prices. Oil-importing economies were more exposed not only to crude oil prices, but also to refined products, such as diesel, affecting transport costs and increasing risks for agriculture and food security.

According to the IEA's 2026 Energy Crisis Policy Response Tracker, governments responded primarily through consumer support measures, including fuel subsidies, tax relief and price stabilisation mechanisms, while a smaller number adopted demand-side actions to reduce fuel consumption. South Africa introduced temporary fuel levy relief, while Kenya used its Petroleum Development Levy Fund to cushion diesel and kerosene prices. Ethiopia combined fuel subsidies with fuel allocation prioritisation and conservation measures. Several countries implemented behavioural and operational measures to reduce fuel demand, including public transport promotion and travel reductions in Rwanda and Mozambique, energy-saving campaigns in Senegal and Gambia, remote working and electricity-saving measures in Seychelles, and restrictions on government travel, lighting and office operations in Egypt.

The crisis also emphasises the importance of structural resilience measures. The World Bank identified transport as a major source of vulnerability, noting that road transport accounts for around 80% of imported fuel consumption across Africa and higher fuel prices rapidly feed into freight and food prices. It highlighted electric mobility deployment in Ethiopia, Kenya and Rwanda as a means of enhancing energy security.

At the continental level, African ministers approved the Continental Energy Security Policy Framework and further implementation of the African Single Electricity Market and the Continental Power Systems Master Plan, reinforcing efforts to improve long-term resilience through regional integration, electrification and reduced dependence on imported fuels.

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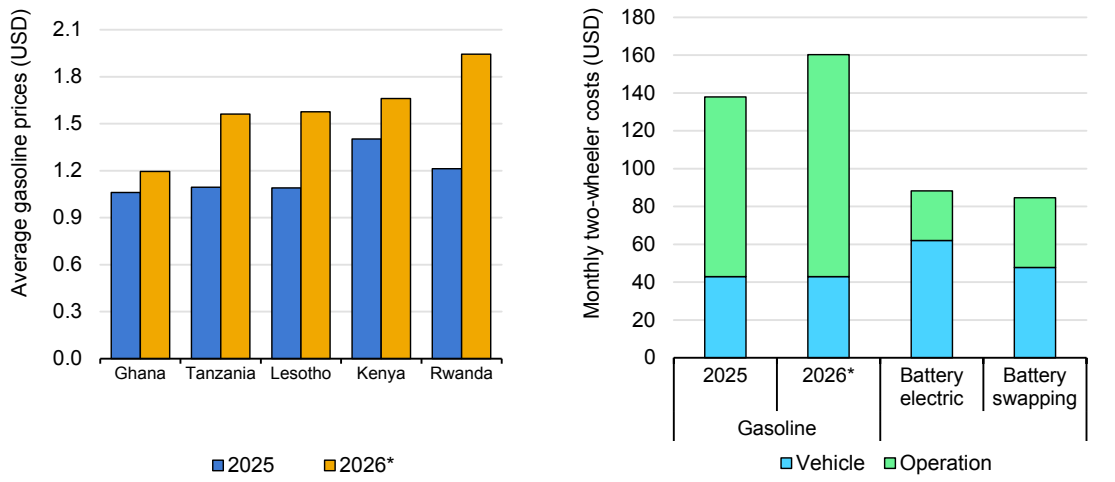
African countries move towards efficient transport solutions as crisis highlights fuel import vulnerability

The 2026 energy crisis strengthened the economic and energy security case for transport electrification in Africa by highlighting the dependence on fuel imports. African ministers endorsed the Continental Framework on Electric Mobility in April 2026, alongside the Pan-African Action Plan for Active Mobility, aiming to accelerate the deployment of electric vehicles, expand charging infrastructure and local manufacturing and promote sustainable mobility. At country level, Kenya launched its National Electric Mobility Policy in 2026, explicitly linking transport electrification to reducing dependence on imported fuels and strengthening energy security. Rwanda further expanded support for electric mobility through fiscal incentives and charging infrastructure, while limiting new commercial public transport motorcycle registrations in Kigali to electric models.

Electric two-wheelers are particularly relevant in many African countries, where they provide affordable mobility and are widely used for commercial activities, such as delivery services. Amid rising gasoline prices, the economics of electric two-wheelers improved further. Although purchase costs remain generally higher than for comparable internal combustion engine vehicles, the greater efficiency of electric models, combined with the lower volatility of electricity prices, can reduce monthly costs by nearly 50% for commercial users, strengthening the attractiveness of electrification for high-utilisation transport services.

Gasoline prices in selected African countries (left) and their impact on the monthly cost of a commercial two-wheeler (right)



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Notes: For electricity, prices represent the 2023 to 2026 average. 2025 = average annual gasoline prices, while 2026* is the price as of June of 2026. For "battery electric", the residential electricity rate applies, and "operation" includes maintenance and insurance. In the case of "battery swapping", four times the industrial electricity rate is applied to account for operational overheads. A commercial user is assumed to travel 500 km a week, versus 175 km for a private user.
Source: IEA (2026), End-use Energy Prices, (accessed 9 November 2026).

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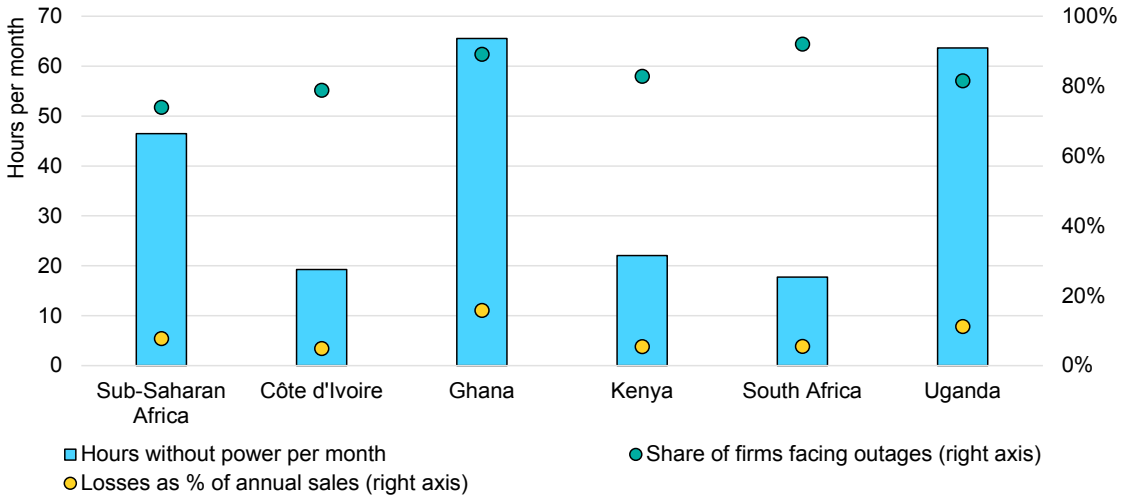
Grid modernisation gains momentum, but financing remains a major barrier to more efficient power systems

The current global energy crisis has reinforced the importance of improving electricity network efficiency and reliability across Africa. In many countries, power systems continue to rely on fossil fuel-based generation, while grid losses remain significantly above the global average of around 7%, reaching 26% in Kenya and 19% in Uganda in 2024. At the same time, ageing grid infrastructure continues to undermine reliability, with frequent outages affecting economic activity.

In response, several countries accelerated efforts to modernise electricity networks in 2025 and 2026. Tanzania launched a nationwide smart-meter rollout to improve network efficiency and reduce losses, while Ghana and Rwanda implemented major grid upgrade programmes, including transformer replacement and distribution network modernisation. Egypt secured USD 690 million in financing to strengthen its transmission network, while regional power pool initiatives RETRADE-SAPP and RETRADE-EA, supported by the World Bank, are helping mobilise investment and expand power trade.

Despite this growing momentum, investment remains insufficient to meet maintenance and modernisation needs, improve system reliability and expand electricity access. The IEA's Financing Clean Energy in Africa report sees annual investment in transmission and distribution networks increasing from around USD 10 billion today to nearly USD 50 billion by 2030 in a scenario achieving these goals. Bridging this financing gap will be critical to unlocking more efficient, resilient and secure power systems across the continent.

Number and extent of power outages and economic losses experienced by businesses in selected sub-Saharan Africa countries



IEA. CC BY 4.0.

Source: IEA analysis based on World Bank (2026), Formal Sector World Bank Enterprise Surveys, (accessed 9 November 2026).

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3.9 Japan and Korea

The crisis sparked strong demand-side policy responses in 2026

The current conflict in the Middle East disrupted oil and gas supply chains, exposing Japan and Korea to greater supply uncertainty and higher fuel prices. Between February and April 2026, crude oil imports fell by 1.9 mb/d in Japan and 1.0 mb/d in Korea. This weighed on refinery output of oil products, hitting Korea particularly hard, with second-quarter production down 20.1% year-on-year for gasoil/diesel and 18.4% for naphtha. Higher liquefied natural gas prices also raised gas-fired electricity generation costs, with average spot wholesale electricity prices in Japan increasing by more than 30% year-on-year in the second quarter of 2026.

To mitigate these pressures, the two governments introduced measures to protect consumers from higher energy costs and promote energy conservation. Both introduced subsidy-backed fuel price caps, with Korea using the measure for the first time in nearly 30 years. Japan also subsidised electricity and gas bills over the summer, while Korea expanded fuel tax reductions and provided targeted cash support for households and businesses. For energy conservation, Korea launched a nationwide campaign and introduced a mandatory two-day restriction on public-sector vehicle use, while Japan maintained its annual summer energy-saving guidance.

Beyond these immediate developments, energy efficiency has continued to improve in both Japan and Korea in recent years. Japan recorded around 3% improvement in energy intensity in 2025, the latest year of available data for the region, exceeding its average annual improvement of 2.2% between 2019 and 2024. Korea also maintained steady progress, with energy intensity improving by an average of 1.6% per year during the same period.

Demand-side policies in Japan and Korea in 2026 in response to the energy crisis

	Energy conservation	Affordability support	Efficiency investment
Japan	Summer energy conservation campaign (annual)	Fuel price cap; electricity and gas bill subsidy for summer, raised from 2025 level	Subsidy for enterprise energy conservation investment
Korea	Mandatory public sector vehicle restrictions; nationwide saving campaign with practical actions	Fuel price cap and expanded fuel tax reductions; cash support for households and businesses	Priority funding for energy-saving equipment tied to petroleum reduction targets

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Japan and Korea have sustained industrial efficiency gains while maintaining large manufacturing sectors

Japan and Korea remain major manufacturing economies, with manufacturing accounting for around 21% of GDP in Japan and 26% in Korea. Their industrial bases span sectors such as iron and steel, chemicals, machinery, automobiles and semiconductors, many of which require substantial energy and capital. Despite these conditions, both countries have achieved sustained improvements in recent decades, with annual reductions in industrial energy intensity of around 2.1% in Korea and 1.8% in Japan since 2000. This considerably outperformed the global average, which was around 0.2% per year over the same period. Even in the current decade, both countries have maintained strong progress, with annual improvements of around 2.7% in Japan and 1.7% in Korea, while global improvements have slowed to around 0.1%.

This sustained outperformance was supported by a combination of mutually reinforcing structural and institutional factors. Shifts in manufacturing composition helped create favourable conditions for efficiency gains in both countries. Over the last two decades, higher-value-added manufacturing activities have increased their share, while several more energy-intensive activities have declined in relative importance. In Korea, the share of electronics and electrical equipment, including semiconductors, more than doubled from 16.4% in 2000 to 38.3% in 2023, while the shares of basic metals and non-metallic minerals, which include iron and steel and cement-related products, declined. Japan's manufacturing composition also shifted in the same direction, though to a lesser extent.

Industrial electrification was another feature, reflecting changes in manufacturing structure and wider adoption of electricity-based equipment and processes. This was particularly evident in Korea, where the industrial electrification rate rose from around 29% to 40% between 2000 and 2024, placing it among the highest levels across major industrial economies. Japan's industrial electrification rate remained broadly stable over the same period, increasing by around 1 percentage point.

Strong energy management institutions also helped sustain efficiency gains. In Japan, the Energy Conservation Act established a systematic framework for managing large energy users, requiring designated companies to appoint energy managers, report energy use and intensity, prepare conservation plans and manage performance across their operations. The framework is reinforced by a legally established benchmark of at least 1% annual improvement in energy intensity, as well as sectoral benchmarks for selected industries. Voluntary actions by major Japanese industry associations and widespread energy-saving efforts after the Fukushima accident further reinforced this formal policy framework. Korea has developed a multifaceted framework for industrial energy management. Under the Energy Use Rationalisation Act, large energy users are subject to

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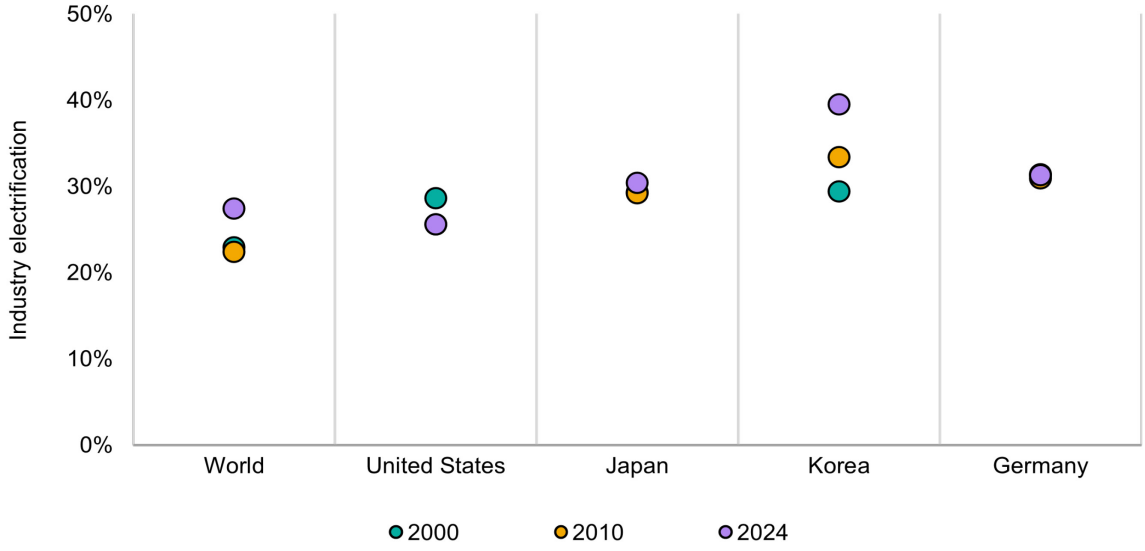
regular reporting and audits, while smaller firms receive subsidised support. This was complemented by the Korea Energy Efficiency Partnership 30, a set of voluntary agreements with the 30 largest energy consumers accounting for over 60% of industrial energy use, to achieve at least a 1% annual efficiency improvement for five years. The Korean Emissions Trading System (K-ETS), launched in 2015, created additional carbon management incentives, while businesses outside the K-ETS have remained under a separate target-management system.

Industry electrification, selected countries, 2000, 2010 and 2024



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Source: IEA (2026), World Energy Balances, (accessed in August 2026).

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3.10 Middle East

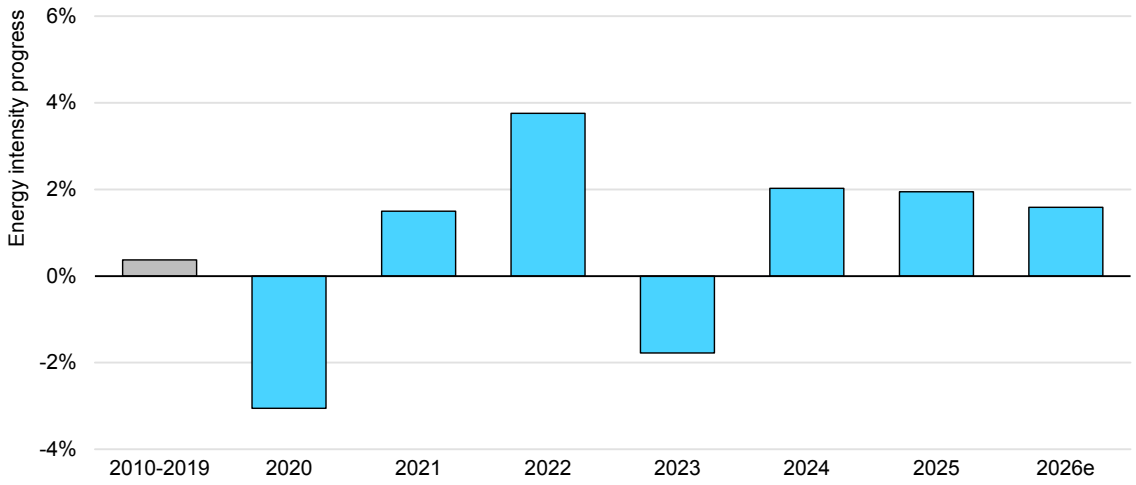
Energy intensity declines slightly in the Middle East as crisis affects both energy demand and economic growth

Energy intensity in the Middle East is set to decline by 1.6% in 2026, as energy demand falls sharply amidst the economic disruption caused by the conflict. This year's variation in energy intensity reflects a change in the economic structure, as the energy crisis disproportionately impacted energy-intensive sectors. Economic growth in oil-importing countries in the region remained resilient.

Oil demand is expected to fall by 8.6% this year, particularly for jet fuel, LPG and naphtha, as flight cancellations reduced aviation activity and disruptions to maritime transit curtailed polymer exports from producers in the region, reducing the output from petrochemical industries. Natural gas demand in the region is also expected to decline by around 10% in 2026, as industrial activity and gas infrastructure were disrupted. These reductions in energy use are primarily a result of the economic effects of the conflict rather than efficiency gains.

Some countries introduced or strengthened energy efficiency policies in 2026. Kuwait launched the fourth edition of its national "Save" campaign, encouraging households and businesses to reduce electricity consumption. Meanwhile, Jordan adopted more prescriptive measures as a result of the energy crisis, restricting AC use in public offices and government vehicle use, and temporarily placing limits on official travel and tighter controls on hosting foreign delegations.

Primary energy intensity improvement, Middle East, 2010-2026e



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Source: IEA (2026), Energy Efficiency Progress Tracker, (accessed November 2026).

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Annex

Abbreviations and acronyms

AC	Air conditioner
AI	Artificial intelligence
BRT	Bus rapid transit
CAGR	Compound annual growth rate
CO_2	Carbon dioxide
CSPF	Cooling seasonal performance factor
D&AI	Digitalisation and AI
EMDE	Emerging markets and developing economies
EnMS	Energy audits and energy management systems
ESCO	Energy service company
EV	Electric vehicle
FYP	Five-Year Plan
GDP	Gross domestic product
HVAC	Heating, ventilation and air conditioning
LED	Light-emitting diode
LPG	Liquefied petroleum gas
MEPS	Minimum energy performance standards
MER	Market exchange rate
PPP	Purchasing power parity
SEER	Seasonal energy efficiency ratio
SME	Small and medium-sized enterprise
STEPS	Stated Policies Scenario
TES	Total energy supply
TFC	Total final consumption
TFEC	Total final energy consumption
VSD	Variable speed drive

Units of measure

EJ	Exajoule
GWh	Gigawatt-hour
km	kilometre
kW	Kilowatt
lm/W	lumen of light per watt
mb/d	Million barrels per day
Mt	Million tonnes
MW	Megawatt
tce	Tonnes of coal equivalent
TJ	Terajoule
Wh	Watt-hour

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