Making electrification work

Renewables and efficiency: EU energy transition essentials

January 2026

The EU must move away from fossil fuels for its security, resilience, independence, and sustainability. Electrification is vital for a successful energy transition, but over half the electricity mix in the EU still comes from non-renewable sources, so it is not the end of the story. Every year the share of renewables grows, but this transition could happen more and faster.

Energy efficiency is an important piece of the puzzle. EU energy efficiency measures saved €120 billion in 2023[1] – and more is possible. Simply replacing fossil fuel combustion with electricity from renewables alone is not enough. To completely shift away from fossil fuels, the EU must also reduce energy demand and pressure on the grid, which needs time to be fully upgraded and capable of coping with increased electricity flows.

Electricity wastes little to no energy. Using renewable-based electricity to decarbonise households, transport, and industry, while at the same time taking advantage of every opportunity for energy savings through efficiency, offers huge opportunities. It will also cost less and provide greater security for Europeans, who will no longer be locked into inefficient and polluting technologies tied to fossil fuels. Accelerating electrification could save Europe €250 billion per year[2].

But there are obstacles to the energy transition: fossil fuels remain a big part of the EU economy – and alongside the harmful impacts on people and planet, that also raises costs. Importing fossil fuels is expensive, with Europe paying two to four times more than other major regions[3]. Producing electricity from renewables is cheaper, but European consumers still face higher electricity than gas bills because of excessive taxes and electricity prices matching that of the most expensive carrier (gas).

This must change, with costs reduced to boost investments in clean, renewable solutions, energy efficiency made a priority, and lower levies and indirect taxes on electricity to support consumers. Upskilling is also needed to better equip installers (for example, of heating technologies) to fit cleaner appliances. All that is left is to implement the well-known solutions and technologies.

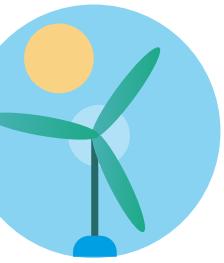
Ensuring energy for electricity comes from **renewable sources**

Prioritising energy savings through **energy efficiency**

Ensuring the technical feasibility of **demand-side flexibility**

Supporting and upscaling **clean technologies**

Prioritising **decarbonising industry and high-emitting sectors**, while **mitigating the impacts** of the most electricity-hungry



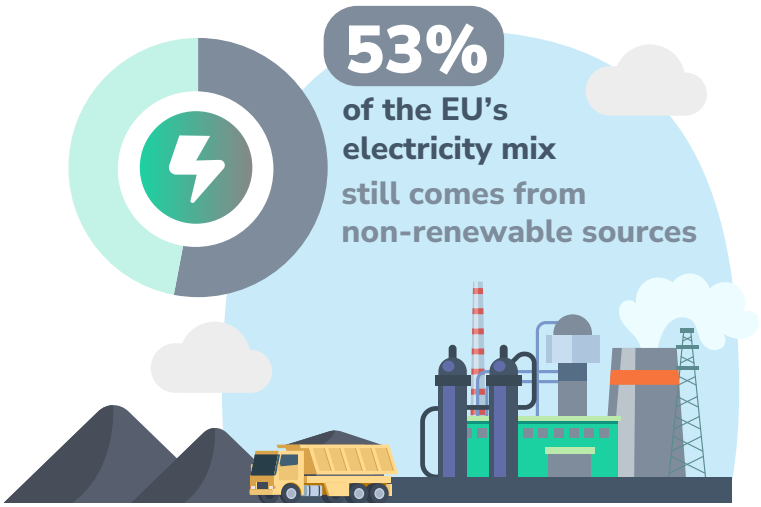
What the EU can do to make electrification work

Ensure energy for electricity comes from renewable sources

Renewable energy is the cornerstone of the energy transition – Europe cannot decarbonise without it. Around 23% of the EU energy system is currently electrified, and almost half of the electricity is produced from renewable energy sources – with important emission savings. Electrification based on renewable energy sources brings many benefits to consumers, improves air quality, and increases energy security as it helps Europe transition away from fossil fuels.

However, the EU is still far from the 32% electrification target set out in its 2025 Clean Industrial Deal. In comparison, China is forecasted to reach 35% electrification by 2030[1]. The EU must make more efforts to electrify key economic sectors – including buildings, transport, and industry – while at the same time, ensure ample renewable energy sources to fully decarbonise electricity production. It can start by implementing its existing regulatory energy framework – from the 2019 Clean Energy Package to the Fit for 55 Package.

While the EU electrifies and decarbonises its energy system, policymakers should also ensure that claims on renewable electricity are true and support the transition. Market-based mechanisms such as the EU Guarantees of Origin[2] system bring high risks of double-counting and do not ensure an additional production of renewable electricity. This only incentivises continued investments in fossil fuels. We need to ensure the tracking of renewable electricity reflects production, distribution, and consumption realities, stimulating a greater renewable electricity production capacity and storage.



Source: European Commission, November 2025, State of the Energy Union Report 2025: https://energy.ec.europa.eu/publications/state-energy-union-report-2025_en

Recommendations to EU policymakers

- **Implement existing legislation**, especially the 2019 Clean Energy Package and updated amendments under the European Green Deal
- **Ensure policy implementation is in line with the electrification targets** set out in the 2025 Clean Industrial Deal and the 2050 long-term climate neutrality strategy
- **Improve renewable electricity tracking** by only allowing renewable energy certificates to be used by users located sufficiently close to the production place, and reducing the lifetime of certificates from one year to one hour

What the EU can do to make electrification work

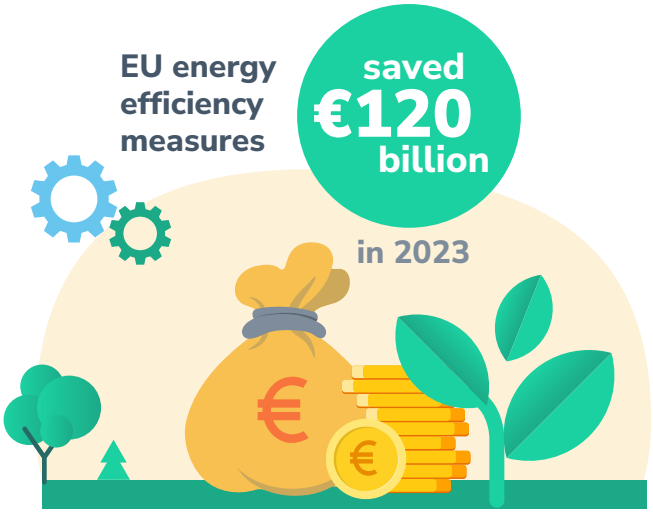
Mainstream the Energy Efficiency First principle

Energy efficiency is not just a natural consequence of electrification – it must be intentionally built into the transition and treated as a guiding principle. The EU cannot wait to decarbonise and electrify every sector before addressing energy efficiency in its policies and recommendations. Reducing energy needs at the same time as electrifying is Europe's path to a successful energy transition.

Energy efficiency measures in the EU saved €120 billion in 2023 – and even more savings can be unlocked by embedding the **Energy Efficiency First principle** into every sector and mainstreaming it to make sure that investments in stranded assets are avoided, and energy demand is reduced in a cost-effective way.

Reducing energy demand through efficiency makes energy more affordable because consumers do not pay for the electricity they do not consume. Energy system costs are also lower because it limits the need for grid upgrades. For companies, it also contributes to lowering the operational costs of electric products and processes.

The environment also benefits from a lower demand for energy. Limiting the exponential growth of energy use is important for staying within planetary boundaries, meeting climate targets, and preventing unsustainable pressures on minerals, water, and land. Energy efficiency can play a big role.



Source: European Commission, November 2025, State of the Energy Union Report 2025: https://energy.ec.europa.eu/publications/state-energy-union-report-2025_en

Recommendations to EU policymakers and Member States

- **Update ecodesign and energy labelling requirements** for all pending energy-related products, especially heating and cooling appliances
- **Implement the Energy Efficiency Directive (EED) and the Energy Performance of Buildings Directive (EPBD)**
- **Mainstream efficiency:** make sure all EU initiatives on electrification contain actionable measures to promote energy efficiency

What the EU can do to make electrification work

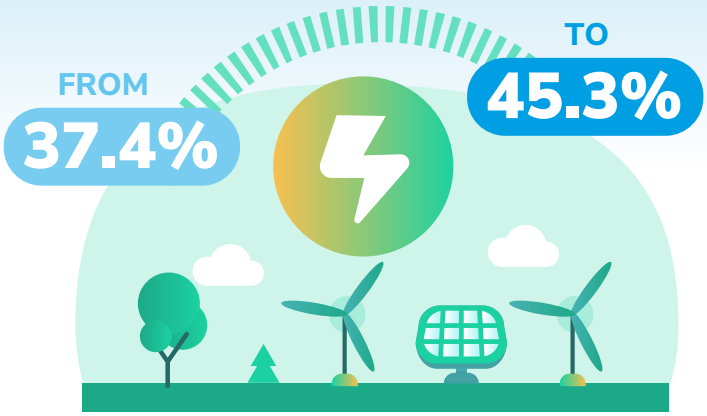
Make demand-side flexibility technically feasible

Grid expansion in the EU is expensive and not happening fast enough. Demand-side flexibility can help to make sure the full capacity of the grid is used, while at the same time reducing the need for grid upgrades.

Demand-side flexibility supports widescale electrification by coordinating how and when devices use the most electricity[1]. For example, when connected to a flexible energy management system, heat pumps and electric vehicles and their chargers can adjust their electricity use to support the grid – only consuming electricity when ample renewable energy is available or when demand for electricity is low.

Demand-side flexibility can bring down the total cost of ownership of electric vehicles and heat pumps, a key step towards electrifying sectors like transport and heating in an affordable way. However, it must be implemented in a future-proof way that allows devices to provide flexibility during their entire lifetime and avoids vendor lock-in. One way to do this is to ensure only energy management systems need to be upgraded whenever new ways to provide flexibility emerge, instead of all devices. New use cases will then only have to be added once, prolonging the lifetime of the device. Just because a device is smart does not mean it is fully flexible – but with the right tools, it can be.

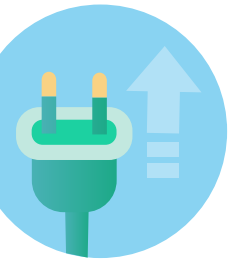
Between 2020 and 2023 the share of electricity in the EU coming from renewables grew



Source: European Commission, November 2025, State of the Energy Union Report 2025: https://energy.ec.europa.eu/publications/state-energy-union-report-2025_en

Recommendations to EU policymakers

- **Make big electric loads,** such as EVs and heat pumps, capable of demand-side flexibility
- **Avoid vendor lock-in** by implementing future-proof, standardised communication protocols
- **Properly reward citizens and businesses providing demand-side flexibility**, with consumers in charge of their own data



What the EU can do to make electrification work

Support and scale up clean technologies

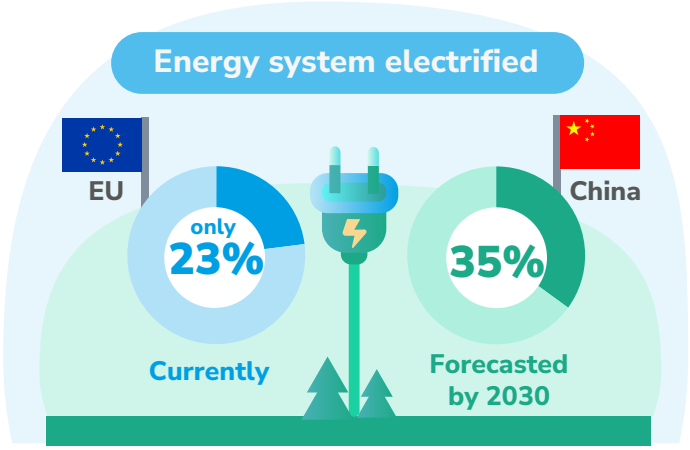
Clean technologies that do not directly burn fossil fuels exist and are widespread. They use electricity and can boost renewable electricity production, but their uptake encounters many challenges. Technologies including solar thermal, PV panels, heat pumps and electric vehicles are ready to be deployed, but there are barriers to remove, such as high upfront and operational costs compared to more polluting alternatives.

To reduce operational costs of clean electric technologies, electricity must become competitive with fossil gas. Taxes and levies across the EU currently benefit fossil fuels, disadvantaging (renewable) electricity. This urgently needs to be rebalanced, making electricity cheaper compared to gas and favouring the passage from polluting to clean technologies. Predictability of renewable electricity production can also help to make it more competitive. This can be achieved by increasing demand-side flexibility and developing energy storage, as well as cross-border planning and grid interconnectors.

Alternative business models can also play an important role in boosting clean technologies. For example, EU Member States can promote initiatives such as social leasing for heat pumps or electric vehicles, where low-income households cover the cost of the heat pump, its installation and ongoing maintenance by paying a monthly fee to reduce upfront costs. The EU can also ensure that its Social Climate Fund supports the lowest income households by shielding them from price rises in the form of non-refundable funds when the EU Emissions Trading System (ETS2) kicks off.

Another key tool is public spending, which can be directed to support renewable electrification. Public procurement guidelines for clean technologies need to be clearer and more easily applicable by EU Member States. Amounting to a staggering 15% of the bloc's GDP, public procurement's full economic potential can then be unlocked, stimulating demand and lead markets for cleaner products by driving market transformation and behaviour changes of citizens and enterprises. Green public procurement can also incentivise the uptake of key technologies such as heat pumps.

Finally, the EU's current grid capacity can be better used to speed up electrification. Electrification should not be hampered by grid capacity issues or connection queues. Measures such as network tariffs, transparency on available network capacity, and optimised network planning aligned with national climate and energy plans should be prioritised. At the same time, grids can be further upgraded and expanded in a cost-effective manner – rightfully prioritising Europe's existing grid over building new lines.



Source: European Commission, November 2025, State of the Energy Union Report 2025: https://energy.ec.europa.eu/publications/state-energy-union-report-2025_en

Recommendations to EU policymakers and Member States

- **Revise the EU Energy Taxation Directive** to reduce taxes on electricity and operational costs, supporting the uptake of renewable electric technologies
- **Promote alternative business models that mitigate high upfront costs** – for example, of EVs and heat pumps
- **Clarify and promote EU public procurement guidelines on clean technologies** for national public authorities so that public money supports electrification
- **Ensure Europe's current electricity grid is used as efficiently as possible** while working to make **it ready for full electrification**

What the EU can do to make electrification work

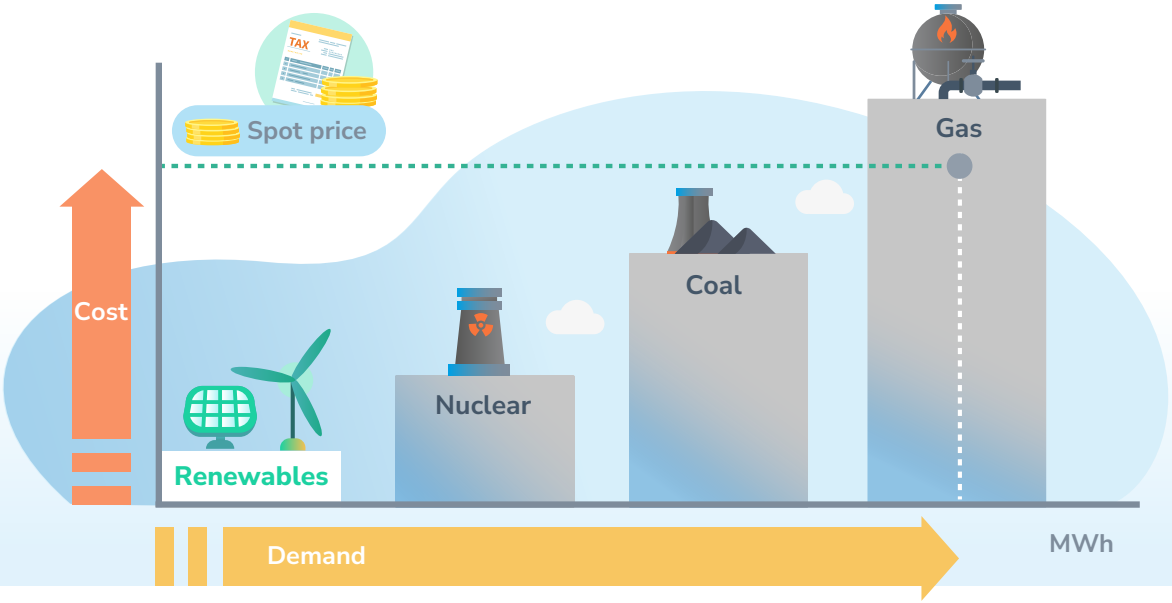
The gas-electricity price ratio explained

Re-balancing the gas-electricity price ratio[1] is key to making electricity bills cheaper for consumers while accelerating electrification. But what does that mean? And how can EU Member States do it?

The price of electricity is set by the Merit Order Effect

Sun and wind are free, so renewable energy is much cheaper to produce than energy generated by fossil fuels, which often need to be imported into Europe from elsewhere. However, electricity prices linked to consumption are set by the most expensive energy carrier needed to supply the demand at different times – and today that is often gas. This is called the **Merit Order Effect**, and the price it sets is called the **spot price**.

As the share of renewables in the energy mix grows, it will start to displace gas, but this transition is slow, and not automatic – governments need to take steps to make it happen.



Consumer costs: Comparing electricity and gas bills

If electricity prices are set by the cost of gas, then one would logically expect household bills for electricity supply and gas supply to be the same. However, this is not the case.

Across Europe, electricity is currently subject to high taxes and other charges – such as network tariffs and levies – which vary by country. These charges are imposed on top of the spot price set by the merit order. This makes electricity bills across the EU frequently higher than gas bills, pushing partly unnecessary extra costs onto consumers and giving them little incentive to shift to cleaner technologies – for example, electric heat pumps instead of gas boilers.

Electricity must become cheaper than fossil fuels to accelerate the energy transition and help consumers

Recommendation to EU policymakers and Member States

- **Rebalance the gas-electricity price ratio**, lowering or moving taxes and levies from electricity bills to gas bills (or general taxation) to make sure the cleanest choices are also the cheapest

1 For more information about the gas-electricity price ratio, see here: https://www.eurelectric.org/in-detail/electricity_prices_explained/ or here: https://www.raponline.org/wp-content/uploads/2025/09/rap-sunderland-gibb-thomas-affordable-electricity-sept2025.pdf

What the EU can do to make electrification work

Prioritise decarbonising industry and high-emitting sectors

Electrification is key for decarbonising many industries – those with the highest emissions, those with particularly highly polluting technologies, and those that are especially electricity-hungry. In 2025, the IEA estimated[1] that most of the growth in global energy demand is led by electricity consumption due to higher demand for cooling, rising consumption by industry, the electrification of transport, and the growth of data centres and artificial intelligence (AI).

Every sector needs clear policy signals from the EU to promote renewable solutions and energy efficiency.

Steel[2]

Shifting from blast furnaces to hydrogen-based direct iron reduction (using hydrogen made from renewable electricity as the reducing agent instead of coal) drastically reduces emissions and should be a priority for decarbonising the steel industry. At the same time, the use of electric arc furnaces to make new steel from scrap boosts the circular economy and reduces energy needs drastically.

Heating[3]

Domestic and industrial heating lags far behind its decarbonisation potential. Electric heat pumps are an energy-efficient technology that is helping the EU transition away from inefficient heating solutions that rely on polluting fossil fuels, but they must be rolled out faster. Other solutions can also help to speed up this transition, such as district heating, solar thermal technologies, and making homes more energy efficient by replacing radiators and renovating when needed.

Cooling[4]

With higher average temperatures due to climate change, the need for cooling is also rising. This could threaten energy reduction targets and lock the EU into continued use of fossil fuels. In 2025, the European Environment Agency estimated that among EU countries, Greece, Italy, Portugal, and Spain could consume almost three quarters of total annual energy use for cooling in residential buildings. Passive cooling solutions as well as more efficient cooling appliances could reduce the energy demand of such a growing need.

Transport[5]

Battery electric vehicles and future-proof charging infrastructure massively reduce the environmental impacts of transport. However, the transition from combustion to electric vehicles must go hand-in-hand with reducing the demand for private transport overall, as well as reducing the overall size of EVs and their batteries to boost efficiency and reduce their environmental impacts even further.

Data centres[6]

Data centres use huge amounts of energy that increasingly comes from fossil fuels. Going beyond efficiency and towards sufficiency is key to decarbonising this sector. If EU action does not come fast enough, the uptake of digital technologies (such as AI, cloud computing, cryptocurrency, streaming services, or gaming) will hamper the achievement of Europe's energy reduction targets and cannibalise all renewable electricity production.