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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

ELECTRIFICATION ACTION PLAN

{SWD(2026) 595 final} - {SWD(2026) 596 final}

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Introduction

The recent crisis in Middle East showed for the second time in five years the risks of the EU's dependency on imported fossil fuels. Even though Europe was better prepared following the measures adopted since 2022, the sharp increase of oil and gas prices had a negative impact on the economy and the society at large. With over half of the EU's energy consumption met by imported fossil fuels, this is a structural vulnerability. Since the beginning of the conflict, the EU has spent more than an additional EUR 50 billion in fossil fuel imports, and the resulting inflation has led to an increase in interest rates. In addition, some Member States have adopted fiscal measures to alleviate the burden on consumers of fossil fuels in the short term, adding to the pressure on their public finances.

In an era of recurring geopolitical turbulence and volatile global markets, an **energy independent Union powered efficiently by clean, abundant, and affordable energy is a matter of sovereignty**. To secure Europe's resilience and security while supporting EU's competitiveness, a radical shift towards efficient electrification of demand is required. Clean energy deployment and energy efficiency are the enablers of a cost-effective and swift electrification. On the generation side, around 70% of the EU's electricity already comes from homegrown clean sources today and important progress has been made in terms of efficiency, but this progress will soon hit a ceiling if not accompanied by an efficient electrification of demand sectors. In 2024, the EU used 20% less energy than it did in 2006[1]. Electrification needs to build on Europe's efficiency gains and continue the shift toward a power system dominated by clean energy.

Electrification would come with substantial benefits for the EU economy and citizens. An accelerated energy transition with electrification at its core could reduce imports of gas by more than 70% and of crude oil by more than 40% by 2040. The EU could save up to EUR 260 billion per year by 2040 on its fossil fuel import bill, which, at the same time, can shield households and industry from the effects of international crises on their energy bills. It would also lower electricity generation costs by about 20%, leading to more affordable electricity tariffs and attracting the switch to electric appliances. Along the value chain, a joint commitment to an electric transition strengthens European business cases by giving investment certainty for expanding clean tech manufacturing and services and creating future-proof jobs across the EU[2]. Electrification would also accelerate achieving the Union´s decarbonisation objective by substantially cutting emissions by more than 2,000 Mt CO_2 in 2040 compared to today[3].

A quicker **electrification of the European economy is therefore key for higher competitiveness, security of supply, and lower energy prices across the entire value chain**, from the manufacturing of net-zero technologies to the energy that reaches homes, businesses and industries. At the level of end use, switching from gas to heat pumps and district heating in homes[4] and offices, and from petrol to electric vehicles[5], trucks and ferries, and electrifying

[1] Eurostat. Figures refer to primary energy.
[2] The International Energy Agency (IEA) estimated that in 2023 Clean energy accounted for 10% of global GDP growth in 2023, and in the European Union, it accounted for nearly one-third of GDP growth, the highest share of any region assessed by the IEA. The IEA also noted that globally in 2023 clean energy investment and sales accounted for between 1% and 4% of total GDP in the four major regions assessed and that 36 million workers were employed across clean energy supply chains. Source : https://www.iea.org/commentaries/clean-energy-is-boosting-economic-growth.
[3] Approximately 20-30% of current CO2 emissions.
[4] "5 things you should know about heat pumps", DG ENER
[5] Ayvens – Car cost index 2025.

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industrial processes, reduces system costs, delivers more affordable, secure and cleaner European energy, helps build up the value chains of an electrified European economy, reduces emissions and air pollution, bringing health benefits.

Yet, despite sharing with other major economies a significant exposure to imported fossil fuels, the EU's electrification rate has remained stagnant at 23% for a decade compared to over 30% in China, Korea, or Japan today[6].

To drive changes, the Commission proposes an ambitious **electrification target** for the European Union.

Action 1

- An indicative electrification target of 46% by 2040 (electricity share in final energy consumption) will be subject to an impact assessment by the Commission as part of the Energy Union Package for the decade ahead (Q4 2026).

With over 8 million battery electric vehicles[7] (BEVs) on EU roads, 28 million heat pumps in EU buildings[8], and increases in large-scale heat pumps in district heating, the change has already started. To progress in the electric transition, **the EU can build on clean technologies, which are already commercially available in Europe for all key sectors from day one**.

As a successful global player in manufacturing clean and efficient technologies, the EU is well-placed to capture upstream opportunities. Boosting the electrification potential would support Europe's strong net-zero technology manufacturing base and related value chains, for example of wind turbines, BEVs or heat pumps, insulation technologies, digital optimisation tools for heating systems, boost the number of qualified jobs significantly and thereby reduce the risk of new strategic dependencies. Clean electrification value chains such as renewables including hydropower, nuclear, heat pumps, battery and thermal energy storage, insulation technologies, solar thermal, digital energy management tools and grids already employ over four million people[9], and the sector accounted for 30% of EU GDP growth in 2023[10]. The EU´s electrification agenda can contribute to a strong European market for these technologies, giving EU manufacturers the scale needed to compete globally. An energy transition with electrification at the forefront could, for example, support the business case for manufacturing electric vehicles in the EU by stimulating the uptake of approximately 120 million BEVs compared to 8 million BEVs today, and of approximately 100 million heat pumps compared to 30 million heat pumps installed today.

Across a growing share of sectors, **clean electric solutions are increasingly cost-competitive to their fossil fuel alternatives and can therefore bring energy costs down for consumers in most cases**. BEVs and heat pumps are more efficient than their combustion alternatives thus increasing energy savings for the European economy. BEVs can still be more expensive to buy but are generally much cheaper to use than petrol and diesel vehicles. Driving a BEV can save

[6] IEA - impetus for EU electrification. The electrification rate corresponds to the electricity share of final energy consumption.
[7] BEVs refer to vehicles running on an electric engine only, while electric vehicles (EVs) refer to BEVs and plug in hybrid vehicles using an additional combustion engine.
[8] European Alternative Fuels Observatory; European Heat Pump Association
[9] IRENA Renewable energy and jobs: Annual review 2025; IEA World Energy Employment 2025; GIFEN, Programme Match, April 2023; ENEN2plus Euratom Research and Training Programme Project
[10] IEA commentary - Clean energy is boosting economic growth, April 2024

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up to 78% compared to an equivalent passenger fossil-fuelled car[11]. Switching from gas boilers to heat pumps cuts the average EU household's heating bill by up to 60%[12], while providing important co-benefits for climate adaptation through their ability to also cool down buildings, especially during heatwaves. In some industrial processes, electrification with heat pumps leads to cost savings if the electricity-to-gas price ratio is between 2.5 and 3.5[13]. These efficiency gains lower energy system costs, reducing energy prices for all users, and benefitting the whole economy.

EU energy legislation[14] already supports efficient electrification. Therefore, its full and effective implementation across all Member States is key. In addition, with the launch of Electrify Now[15] in June 2026, a global platform to drive the acceleration of clean electrification, the EU will also promote electrification globally, as the world enters what the IEA has called the "age of electricity". However, for the EU to stay in the electrification race, urgent additional action is needed.

Tapping into the EU's electrification potential means tackling barriers that still prevent widespread adoption. This requires a value chain approach and taking into account cyber, physical, and economic security threats to electricity networks and is in line with the EU's economic security strategy, as well as anticipating and managing structural change across sectors and regions[16]. First, electricity on average is almost three times more expensive than gas for EU companies and two and a half times more expensive for households[17]. Second, the upfront investment cost of the switch from fossil-fuels to electricity is still very high. Third, electricity grid capacity, connection queues and sub-optimal use of existing grids constrain both the switch to electricity among consumers as well as the addition of new electricity generation capacity. A fourth barrier is slow uptake of innovation to make new electrification solutions commercially viable. Finally, bold action is needed to reinforce European supply chains, boost EU's manufacturing and address skills shortages.

Building on AccelerateEU[18], this plan acts on these barriers to **speed up electrification across the sectors that are most dependent on fossil fuels, notably transport, buildings and industry**[19].

[11] Depending on the Member State. The website https://evroutes.com uses residential prices to calculate savings from the use of electricity compared to oil.
[12] European Commission – Five things you should know about heat pumps: https://energy.ec.europa.eu/news/5-things-you-should-know-about-heat-pumps-2025-12-05_en
[13] IEA – "Renewables for industry – electrification of low-temperature heat and steam", 2026
[14] For example, the Renewable Energy Directive (RED), the Energy Efficiency Directive (EED), and the Electricity Market Design (EMD). The RED mandates integration of renewable electricity in heating, cooling, and transport, directly stimulating electrification. The EMD allows energy communities to generate, store, and share renewable electricity. The EED requires national policies to enforce the "energy efficiency first principle", which prioritizes cost-effective, highly efficient electrical solutions over traditional fossil fuel combustion.
[15] Electrify Now - Energy - European Commission
[16] 2025 Full Progress review on the implementation of the Council Recommendation on ensuring a fair transition towards climate neutrality, European Commission Working Document, July 2026 (forthcoming).
[17] Eurostat
[18] COM(2026) 370 final
[19] The KPI for electrification rate is 32% by 2030.

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1. Reducing the gap between electricity and fossil energy costs

Electricity prices for households and industry are in many cases significantly higher than for fossil fuels. Only in two Member States electricity is less than twice as expensive as gas[20]. Price disparity between electricity and fossil fuels is a structural and critical barrier, which needs and can be resolved to encourage electrification for both industry and households. This structural imbalance is due to several reasons, including the dominance of fossil fuels in setting the price for electricity and infrastructure costs. The latter are then distributed among end-consumers in a way not matching the realities of generating and distributing electricity. While the electricity system is growing and changing, the design of network charges needs to evolve to ensure cost-efficient transmission and distribution networks and the optimal use of existing electricity systems. Furthermore, levies and taxes on the electricity bill are in some cases disproportionate and unrelated. Taking all taxes into account, electricity is taxed more than gas for final consumers in most Member States[21] and in at least five Member States, some of these levies are unrelated to or go beyond the electricity system[22]. Finally, energy subsidy regimes in several Member States, mainly for fossil fuels, prevent business cases for electrification and distort market prices by artificially lowering the cost of fossil fuels and weakening market signals for cleaner energy. The impacts are visible on electricity bills. To date, half of the amount paid by EU households through their electricity bills corresponds to the price of electricity, a quarter to network charges and a quarter to taxes and levies[23].

The gap between electricity and fossil energy costs can be measured via electricity-to-gas price ratios. A ratio of two means that electricity prices are double those of gas for the same amount of energy. A high ratio directly stifles demand for electric alternatives: Member States with the lowest electricity-to-gas price ratios record triple the heat pump sales compared to Member States where the ratio exceeds three[24]. When electricity costs are over 2/2.5 times more than gas, the economic case to switch to heat pumps or other electric processes diminishes significantly.

The Commission therefore supports efforts by Member States to remove disparities between electricity and fossil fuel energy costs. The Action Plan for Affordable Energy, the Energy Union Task Force, and the Clean Industrial Deal State Aid Framework have provided tools for action and coordination, and the Recovery and Resilience Facility has supported reforms in this area. The Commission encourages Member States to take actions to bring national electricity-to-gas price ratios down for households to maximum 2.5 and for industry to maximum 2 by 2030. This plan aims at providing a pathway towards these levels.

[20] Only in Finland and Sweden is the electricity-gas price ratio below 2 for the same amount of energy – own calculations based on Eurostat data for second half 2024.
[21] Source: Eurostat, all taxes including excise duties and VAT.
[22] France, Germany, Italy, Portugal and Greece.
[23] Source: VaasaETT, data for May 2026 – 48% electricity, 26% taxes and levies, 26% network charges.
[24] EHPA - Taxation policy for heat pumps, 2025.

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Electricity-to-gas price ratios in EU Member States[25] for industry and households in 2025[26]

1.1 Reducing electricity system costs through network charges, flexibility and storage

Switching towards electrification can only convince households and industry if the conditions are right. Electricity supply needs to be reliable and affordable. On the contrary, price volatility creates uncertainty, raises risk and the cost of capital, undermining the case for electrification. Energy storage (household batteries, long-duration and large-scale batteries, thermal and pumped hydropower storage) and flexibility services are key for a stable and reliable energy system with affordable energy prices.

Flexibility empowers to react to spiked, zero or negative prices and smooth prices as well as enhancing the resilience of the energy system and lowering system costs to the benefit of all users. Households, industrial consumers, hydrogen producers, data centres and drivers of BEVs[27] can also gain from being flexible, with the right remuneration and framework conditions, such as dynamic price contracts and dynamic network charges as well as remuneration for the provision of ancillary services. The Commission supports Member States in ensuring the use of flexibility from existing buildings and products, with a focus on

[25] Malta, Cyprus and Finland (for households) are not present in the relevant Eurostat datasets.
[26] Commission's calculation based on EUROSTAT data.
[27] For instance, EVs can engage in smart and bidirectional charging through vehicle-to-grid (V2G) services. Based on existing projections, companies above 100 employees (except rental fleets, taxis and private car services) could reach a share of 50% of their fleet charging smartly, and 15% of their fleet reinjecting electricity into the grid by 2030 (Shares based on different studies/publications - ENTSOE TYNDP assumptions, T&E). Commission analysis shows that by 2040, BEV smart charging and V2G could deliver over €44 billion in annual savings for BEV owners and additional benefits to the power system through reduced investment needs.

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transparency for consumers[28]. Flexibility also ensures that new demand for power does not excessively increase system costs.

Expanding computing capacities on the Union´s territory and Artificial Intelligence (AI) developed and deployed in the EU through innovative and sustainable Cloud and AI technologies are essential for the EU´s Tech Sovereignty. With the proposal for a Cloud and AI Development Act[29], the Commission aims to address the limited and geographically concentrated availability of computing capacity in the EU and the risks associated with dependence on cloud and AI supplied by non-European providers. But it also poses challenges, not only in terms of increasing energy consumption but also for electricity grids, carbon emissions and environmental resources such as water. To limit the impacts, data centres need to be highly energy- and water-efficient and sustainable. Well-designed and integrated flexible data centres can help reduce overall electricity system costs and moderate prices by supporting grid stability and renewable integration. Flexible data centres can contribute to grid efficiency, demand response, on-site clean energy capacity, and system flexibility, and should therefore be adequately incentivised. Data centre acceleration zones established by the Member States, as proposed in the Cloud and AI Development Act, and the tripartite agreement announced in the Strategic Roadmap for Digitalisation and AI in the Energy Sector could help facilitating the integration of data centres, enabling infrastructure deployment and limiting the impacts on resources and consumer bills.

Energy storage is an essential element to optimise the functioning of the EU energy system, notably long-duration energy storage providing power for more than eight hours to provide reliable base power to reduce dependence on fossil fuel backup capacities and to make better use of domestic renewable generation. The Tripartite Agreement on Energy Storage[30] has recently brought together important players in the value chain, including Member States, storage and renewables developers and manufacturers, industrial consumers as well as the European Commission and financial institutions around mutual commitments to accelerate exploitation and deployment of energy storage capacities as a priority for the coming years (2026-2028). The pledges submitted for the period 2026-2028, taken together, account to 30-35 GW of stationary storage capacity.

Nevertheless, further efforts will be needed to meet the energy system's flexibility and energy storage needs by 2030 (200 GW[31] and 500 GW installed by 2040, from around 55 GW in 2026), both for short- and long-duration storage. For cross-seasonal storage, potential revenue streams are often insufficient to cover upfront investments.

Storage is also increasingly important for industrial consumers. In Power Purchase Agreements, electricity storage can help cover more of the consumer's demand with renewable sources[32]. Member States can promote this by implementing the April 2026 Commission Recommendation on removing barriers to PPAs[33]. On the demand side, thermal storage provides another source of flexibility for industries that use heat: its capacity in the EU is expected to triple to 1.5 GWh by 2028.

[28] For instance, through a new expert group to activate flexibility from new and existing buildings and products.
[29] COM(2026) 502 final.
[30] https://ec.europa.eu/commission/presscorner/detail/en/ip_26_1426
[31] Source: Commission's estimates.
[32] More granular guarantees of origin can also contribute to this evolution. See Commission Recommendation on removing barriers to the development of power purchase agreements and other energy purchase agreements (C/2026/2676)
[33] C/2026/2676

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Since electrification is at the heart of the EIB Group's energy strategy, the EIB Group intends to provide more than EUR 75 billion over the next three years, focusing on large-scale electrification of end-use sectors in industry, buildings and transport, alongside decarbonisation and capacity expansion in the power sector. This includes investment in grids, storage and flexibility solutions to support higher electricity generation, wider electrification and the integration of variable renewables. The EIB Group is also strengthening support for manufacturers of related equipment, including industrial electrification technologies, heat pumps and EV chargers.

Action 2

The Commission has adopted alongside this plan

- *a **legislative proposal on network charges to incentivise electrification**, a flexible and system-friendly use of the grid, including storage installations and accelerating smart meter deployment, and to improve the electricity-to-gas price ratio from the network charges side.*

The Commission will

- *propose a **new network code and the revision of the network codes on requirements for generators and demand connection** in 2026 to facilitate demand response and the seamless integration of battery storage, thermal storage, geothermal, EVs and heat pumps into the electricity grid;*
- *together with other parties to the **Tripartite Agreement on Storage**, and the Energy Union Task Force, ensure robust implementation of the commitments agreed in this cooperative model, covering the whole storage value chain, including long-term storage solutions;*
- *organise a **high-level conference to assess barriers and solutions for storage**, including long-duration storage and combined with renewable PPAs;*
- ***assess the EU's long-duration flexibility needs** for 2030, 2040 and 2050, drawing on flexibility needs assessments and estimating in particular the potential of long-duration storage and demand response, and help identifying priority use cases, barriers to deployment and investment needs, including in energy-intensive industries, data centres, islands, remote areas, grid-constrained regions.*

KPI: 200 GW of storage capacity by 2030 from around 55 GW in 2026.

The Commission will

- *launch a framework for **regulatory sandboxes and living labs** across Member States to enable new vehicle-to-grid (V2G) business models (cf. **SWD(2026) 596**);*
- ***assess and promote the introduction of smart charging** by default in electricity supply contracts linked to EVs by mid-2027;*
- *introduce by end of 2027 **V2G requirements for new EVs placed on the internal market in the Union as of 2030**, including technical requirements to enable interoperability such as standardised communication protocols [34];*
- *support the **development of a methodology to assess the flexibility potential in different industries and industrial processes,** as well as data centres, to fill the knowledge gap in the emerging industrial flexibility sector by 2027;*

[34] On the basis of the necessary empowerment for the Commission to take action in this field, proposed through Omnibus IX (Automotive Omnibus).

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- *adopt a **common Union rating scheme for data centres** to increase transparency in the energy use of data centres and promote lead markets for sustainable digital assets and services across Europe, as well as introduce **minimum performance standards for data centres** to leverage their flexibility potential.*

1.2 Addressing the gap in taxation between electricity and gas

To address another component of the electricity bill and to contribute to the rebalancing of electricity and gas prices, Member States can carry out taxation reforms. To align the principles of electricity taxation with electrification, electricity should not be taxed more than gas. Recently, the Netherlands and Belgium have taken steps to rebalance electricity and gas prices by limiting the gap in taxation between those energy carriers. Also, Denmark has acted by reducing electricity excise duties to households using heat pumps and reduced electricity taxes to the minimum for two years.

In addition, energy subsidies represent fiscal efforts and costs to public budgets. It is, therefore, essential that energy subsidies are well designed and well-spent and provide coherent support for EU policy objectives, for instance for electrification of key sectors. In 2024, fossil fuel subsidies amounted to EUR 97 billion, a high level compared to around EUR 60 billion on average between 2015 and 2019.[35] In 2024, fossil fuel subsidies declined by 20% compared to 2023 (EUR 121 bn) and by 42% compared to the peak in 2022 (EUR 168 bn), due to the phase-out of a many temporary crisis measures. According to national phase-out plans communicated by Member States during 2023 and 2024[36], less than half (39% or EUR 38 bn) of fossil fuel subsidies had a planned end-date before 2025, another 8% (EUR 8 bn) were scheduled to end between 2026 and 2030, while for the remaining 52% (EUR 50 bn), there is either no end-date, or the end-date has been set after 2030.

Action 3:

The Commission has adopted alongside this plan

- ***as part of the legislative proposal on network charges** a provision regarding the tax differential between electricity and gas.*

The Commission will

- *propose **measures on progressively phasing out fossil fuel subsidies** as part of the post-2030 Energy Union package (Q4 2026).*

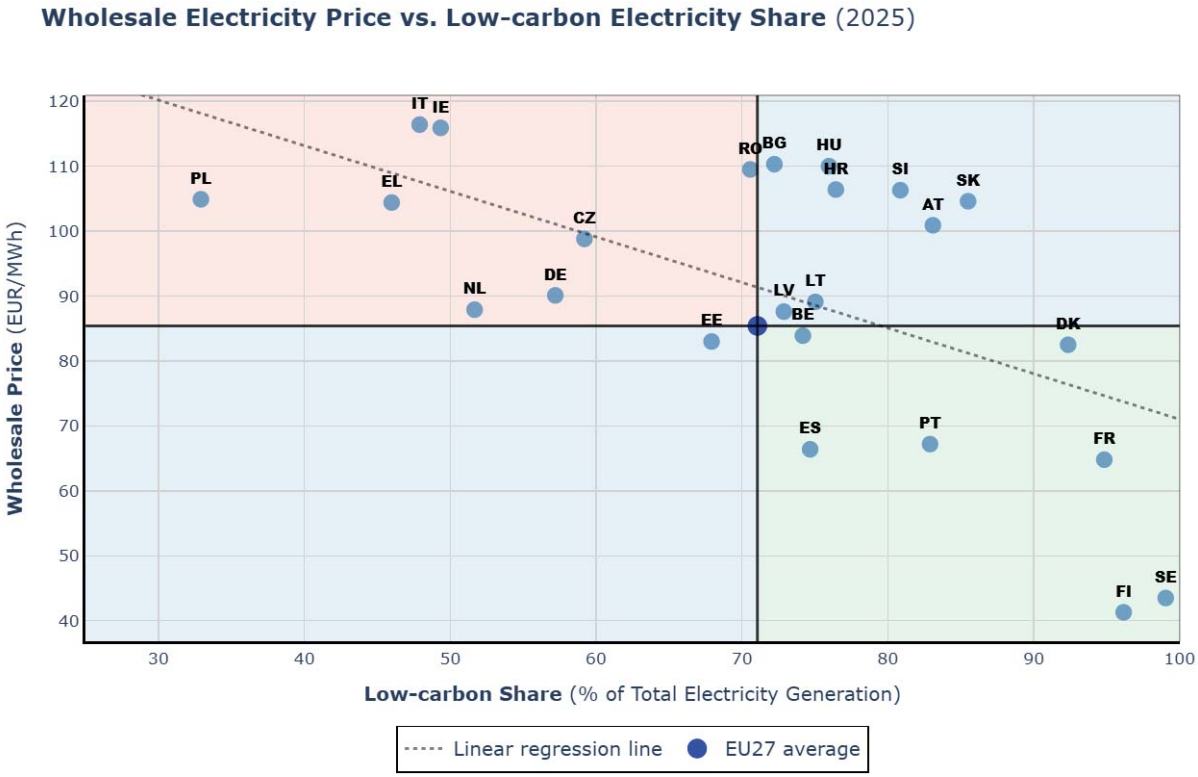
KPI on national electricity/gas price ratios to maximum 2.5 for households and 2 for industry by 2030[37]

[35] Report to European Parliament and Council on Energy Subsidies in the EU (forthcoming).
[36] Plans to phase out fossil fuel subsidies from 2024 onward.
[37] The basis to calculate the level of the KPI is the coefficient of performance of heat pumps in residential and industrial use, respectively, compared to gas boilers. In addition, the KPI takes into account the need to recover the initial capital investment.

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1.3 Making electricity cheaper and increasing the share of clean affordable, homegrown energy

As the figure below shows, the lowest electricity prices in the EU are observed in markets with very high shares of clean electricity (renewables and nuclear[38]) since they are less exposed to fossil fuels setting the wholesale electricity price. Moreover, renewable and nuclear energy drive fossil fuels out: the additional 260 GW of wind and solar capacity installed since 2021 displaced 14 bcm of gas only in 2025, saving more than EUR 5 bn in fuel costs. As electrification increases demand for electricity, more rapid growth of renewable and nuclear generation will be needed[39]. Therefore, Europe needs to move even faster.



The EU has put in place a supportive framework for accelerating the growth of clean electricity capacity[40], including the EU ETS carbon price. Implementation and enforcement of the EU energy legislation towards the achievement of the agreed 2030 targets, including the renewable energy framework, is a priority. The integration of renewable generation in the system is hampered by insufficient planning, lack of location signals, grid congestion, lack of energy storage capacities and a general lack of flexibility resulting in regular curtailment. Although the Renewable Energy Directive (RED III) addresses some of the barriers to electrification and the deadline for its transposition expired on 21 May 2025[41], no Member State has fully transposed the respective parts of this framework yet. This slows down the roll out of renewable capacity, contributing to persistently high electricity prices. In addition, SMRs can strengthen

[38] In 9 Member States, the share of nuclear generation was above the EU average of 23% in 2024: Belgium, Bulgaria, Czechia, Finland, France, Hungary, Slovakia, Slovenia and Sweden.
[39] This displacement of fossil fuels also pushes down the primary energy factor (PEF), which reflects the higher efficiency of electricity in final uses. The PEF is defined through the Energy Efficiency Directive and is set to be revised by the end of 2026.
[40] Affordable energy action plan, AccelerateEU as well as Renewable Energy Directive and Electricity Market Design, with Power Purchase Agreements and two-way Contracts for Difference growth, and acceleration of permitting through the Grids package
[41] Except for some provisions related to permitting for which there was an earlier deadline of July 2024.

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EU's energy security and autonomy by reducing reliance on fossil fuels, while complementing renewable sources.

In addition, further actions are needed. Across the board, Europe can improve predictability and coordination of clean energy supply investments and help leverage the unique density of the European electricity grid. Coordination of these investments in generation with flexibility should also be improved as this plays a key role for the affordability of electricity prices. At EU level, an existing platform provides transparency for all stakeholders on upcoming renewable energy auctions. By adding a database with detailed information on these auctions and flexibility support schemes, the Commission will support Member States in making best use of public funds to accelerate renewables deployment for the benefit of electricity consumers.

Action 4

The Commission will

- ***reinforce support to Member States in implementing*** *Directive (EU) 2023/2413 on the promotion of energy from renewable sources (REDIII) with the aim to have full and adequate transposition by Summer 2027.*
- *support* ***cross border cooperation amongst national authorities in the interest of faster nuclear reactor licensing decisions****. In full respect of Member States' prerogative to determine their own energy mix, lifetime extension of existing reactors should be pursued unless uneconomical or incompatible with highest safety standards.*
- *review relevant EU legislation* ***to facilitate the conclusion of long-term cross-border electricity contracts****, including between low-carbon generators in one Member State and off-takers in another and launch, by Q2 2027, a* ***map-based tool*** *to help energy-intensive industries and investors assess the location-specific factors that inform their energy investments decisions (“****GeoDep****”), such as proximity of generation, available infrastructure or favourable electricity-to-gas price ratios[42];*
- *set up a* ***detailed auction design database by 2027 to complement the existing RES auction platform[43],*** *to make the best use of public support;*
- *adopt* ***guidance on NZIA non-price criteria in renewable energy auctions*** *to ensure a secure and diversified industrial base for clean energy technologies.*

Geothermal energy remains an underutilised resource for high efficiency renewable electricity and a heating and cooling solution with reduced network costs. According to recent estimates it could cost-effectively meet at least 10% of Europe's electricity needs[44] and 25 % of its heating and cooling demand, if an enabling framework were put in place. In addition, geothermal as well as solar thermal have the potential to contribute to passive cooling.

Action 5

The Commission will create a Geothermal Stakeholder Partnership by Q1 2027 to help lifting regulatory, technical and investment barriers and accelerating the deployment of geothermal

[42] This tool could also provide support for the establishment of Industrial Manufacturing Acceleration areas in the context of the legislative proposal for an Industrial Accelerator Act.

[43] https://union-renewables-development-platform.ec.europa.eu/auctions/auctions-table-overview

[44] Ember estimates that 43GW of enhanced geothermal could be developed in the EU at costs below €100/MWh, Ember February 2026.

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energy. The Geothermal Stakeholder Partnership will gather skilled professionals from Member States and the industry to exchange best practices on data collection, national geothermal development strategies, financing, permitting, skills and public acceptance.

2. Lowering upfront costs for electrification of end-use sectors

To accelerate electrification, upfront technical, administrative and financial costs need to be tackled. While ETS1[45] already drives the business case for decarbonisation in the electricity sector in industry and maritime transport, ETS2[46] will play a crucial role in incentivising electrification in road transport and buildings, including for SMEs, while generating the revenues to accelerate much-needed investments to support users´ transition towards more clean energy sources. The Social Climate Fund will accompany the implementation of ETS2 through targeted support for vulnerable households, transport users, and micro-enterprises. Member States can also address this barrier through tax reforms, such as providing preferential tax regimes for investments in electrification. Only six Member States apply to heat pumps a VAT rate below that for gas boilers[47], and the Commission encourages other Member States to follow suit. Member States can offer reduced registration taxes for electric vehicles, shorter depreciation times or tax incentives for company EVs or heat pumps[48]. Member States may make use of targeted fiscal flexibility by requesting a broadening in the scope of the National Escape Clause (capped at 0.3% of GDP annually and 0.6% of GDP on a cumulative basis) to introduce energy security measures reducing dependence on imported fossil fuels, including electrification[49]. The Commission will engage with national promotional banks within the context of the Energy Transition Investment Council to provide guidance. It will also provide best practices to national promotional banks, including on financing electrification projects.

In Annex II, the Commission proposes guidance to Member States on social leasing and support schemes for e.g., household batteries, clean energy and heating and cooling products, as well as for BEVs. On this basis, the Commission will support Member States to direct funds under the Social Climate Fund to these mechanisms.

Action 6

Member States are encouraged to ***make use of the options already laid down in the VAT Directive[50]*** *to support electrification by applying lower VAT rates to electrification technologies, e.g., heat pumps, solar panels and residential batteries, and to offer reduced registration taxes for electric vehicles, shorter depreciation times or tax incentives for company BEVs.*

As part of the Circular VAT initiative announced in the Clean Industrial Deal, the Commission will present an ***EU framework for Member States to encourage electrification of corporate fleets****.*

[45] Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC
[46] Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system
[47] European Heat Pump Association EHPA – "European countries failing to make heat pumps affordable"
[48] The Commission recommended such tax incentives in the Clean Industrial Deal, and set out design principles for them
[49] 2026 European Semester - Spring Package - COM(2026) 200 final.
[50] Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax

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2.1 Industry

While the EU's industry sector has achieved major energy efficiency improvements, it represents almost a quarter of the EU's energy demand and the sector's shift from fossil fuels to electricity remains slow. Industrial waste heat recovery also offers a large potential, estimated at 300 TWh/year[51], to bring down energy costs.

With the right conditions, industrial electrification represents an opportunity for European industry to modernise, further increase its efficiency and productivity and reinforce its global competitiveness. Electrification is technically already feasible for 60% of industrial energy demand that relies on fuels[52], using in particular industrial heat pumps.

In many cases, new equipment needs to be adapted to be rolled out for specific industrial applications. Accelerating this transformation requires an approach that coordinates all relevant actors across the value chain to jointly address obstacles. Electrifying industrial processes in the most energy-intensive industries will lead to a substantial increase in the EU's electricity demand, with the demand from the steel sector alone potentially more than doubling to 165 TWh by 2030 and further major increases in aluminium, cement and chemicals by 2050[53]. For instance, a case study in the dairy sector concluded that investments in high-temperature heat pumps can break even with gas systems in 10 years if the electricity-gas price ratio is around 2[54].

Immediate efforts should focus on applications with the highest potential for electrification with commercially available technologies. Electrification technologies can already deliver process heat up to 400-500°C, for industries such as food and beverages, pulp and paper or textiles, using industrial heat pumps or electric boilers[55]. Economic gains are achievable in processes requiring such low to medium temperatures. Certain higher-temperature applications[56] can to a large extent be electrified through resistance heating and electric arc furnaces. For other high temperature processes, e.g. petrochemicals production, electrification is at a demonstration stage.

The reuse of excess heat, either on site in the same plant, in a data centre or in an industrial cluster, or through district heating, combined with electrification will further improve the efficiency of industrial processes. As data centres are already electrified, their growing consumption goes hand in hand with electrification; its smooth integration with the grid can be improved, through digitalisation, flexible connection agreements, additional renewable generation capacity, including on-site, and the use of microgrids.

Some of the initiatives launched under the Clean Industrial Deal, notably the Clean Industrial Deal State Aid Framework and the related recommendation on tax incentives can already be relied upon by Member States for lowering costs for electrification for industry. Furthermore, the Industrial Accelerator Act would create lead markets strengthening the demand for low-carbon and "Made in EU" products. The Commission encourages co-legislators to adopt the legislative proposal promptly and anticipate its implementation.

Action 7:

- *The proposal for the revision of the ETS Directive supports the decarbonisation of industry, including energy-intensive industries, inter alia through ensuring the Member States spend*

[51] The equivalent of the heating needs of 15 to 20 million homes RE-WITCH, 2025, Understanding the regulations governing waste heat & cooling technologies, Danfoss Impact, 2023, The world's largest untapped energy source – Excess heat
[52] Fraunhofer ISI/Agora "Direct electrification of industrial process heat"
[53] Eurofer (2026), Position Paper EU Electrification Action Plan
[54] Future Cleantech Architects - Case Study: Electrification and Thermal Energy Storage in the Dairy Industry, 2025
[55] The direct use of renewable heat can also be a cost-effective solution for many of these processes, where available.
[56] And further industries like ceramics, building materials or glass manufacturing.

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more of the national ETS revenues on the decarbonisation of the industrial sector and making the transitional free allocation of allowances conditional to investments into emissions reductions, including electrification.

- *The proposal for a revised ETS framework includes the establishment of the € 100 billion Industrial Decarbonisation Bank including the €30 billion ETS Investment Booster. Both mechanisms can support investments in industrial electrification, as the critical pathway for industrial decarbonisation, grid connection infrastructure, on-site energy management systems and battery or thermal storage, benefiting system integration. The calls for proposals will be launched immediately after the legislation is adopted.*

The Commission will

- *launch a **second industrial heat auction under the Innovation Fund in 2026** and further support the rollout of electrified and renewable heat solutions and industrial flexibility solutions to reduce reliance on imported fossil fuels;*
- *examine the case for an **EU-level mechanism to pool industrial electricity demand** and improve access to diversified low-carbon energy to reduce financial risks associated with PPAs;*
- *support **exploring the potential and barriers for deploying direct-use renewable heating technologies** (including thermal energy storage) for certain types of industries and geographies where direct heat might be plausible and more efficient than electrifying[57];*
- *collaborate with industrial sectors, technology suppliers and Member States to develop **sector-specific electrification roadmaps along the value chain**, including the scale-up of electrification technologies, standards, modularisation of components, demand flexibility and protocols for the effective integration of these technologies in industrial processes, innovative business models and access to financing;*
- *work with industry to **facilitate cluster-based partnerships for electrification and waste heat reuse of industrial sites**, involving industrial actors, including data centres[58], as well as providers of energy and flexibility services[59].*

2.2 Transport

Road transport consumes almost a third of the EU's energy[60]. Whilst the number of **BEVs** has grown more than sevenfold since 2020 only 2.9% of cars are battery electric. Across the EU, more than 8 million BEVs are already leading the transformation of the sector which depends the most on imported fossil fuels. In 2025, even before the conflict in the Middle East, BEVs saved EUR 4.1 billion in avoided oil imports[61]. Passenger BEVs sales have climbed to a record 20.7% of new sales in April 2026[62], notably driven by the CO_2 emission standards as the main EU-wide policy tool, tax incentives, new support schemes including social leasing and a lower total cost of ownership than comparable petrol and diesel vehicles. Nevertheless, progress is still required, notably in the battery electric heavy-duty vehicles (e-HDV) sector. The Commission therefore encourages Member States to exempt zero-emission lorries from tolls

[57] The Commission has launched the Call for Tenders 'European medium temperature heat for industrial processes: needs, barriers, and opportunities for direct use renewable heat technologies' to assess Europe's medium-temperature industrial heat demand, identify the potential and barriers for deploying direct-use renewable heating technologies (including thermal energy storage), and produce best-practice examples to support the decarbonisation of industrial process heat across EU Member States

[58] Building on new initiatives such as Eurelectric's « power couples » plan.

[59] Possible priorities for these partnerships include demand aggregation for PPAs or heat storage services or engagement with electricity grid operators to facilitate grid access.

[60] Eurostat

[61] EMBER - A clean break: leaving fossil volatility for clean tech security

[62] European Alternative Fuels Observatory.

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and apply reduced toll rates for zero-emission vehicles in line with the Eurovignette Directive[63]. The Commission proposed a Clean Corporate Vehicles Regulation to accelerate the registration of electric cars by large companies, which are also a source of affordable vehicles for the second-hand EV market, due to their high turnover[64]. Some Member States use taxation of corporate cars to incentivise electrification, which the Commission encourages: Belgium did so in 2021 and the BEV share in new corporate car registration reached 54% in 2025[65]. Other Member States are encouraged to follow suit.

Member States can direct Social Climate Fund and ETS revenues to finance social leasing schemes for EVs for lower and middle-income households, or toll exemptions. Fiscal incentives, subsidies or low-interest loans, including for second-hand EVs, are also effective tools for Member States to increase EV affordability. Beyond road transport, the electrification potential of maritime transport is also growing and the framework to enable the necessary investments deserves attention. Finally, in the decarbonisation of the aviation sector, electrification can play a growing role alongside sustainable aviation fuels (SAF), contributing to a stronger industrial base in the EU.

Action 8

The Commission will

- ***review the Clean Vehicles Directive*** *to assess targets and possibly further strengthening public procurement of zero emission vehicles by Q4 2027;*
- *put forward a* ***recommendation on Fiscal and Non-fiscal demand-side incentives for zero-emission vehicles*** *by Q4 2026;*

KPI: By 2040, sufficient grid connections for publicly accessible HDV recharging and HDV depot charging will have to be deployed to enable 40% battery electric propulsion of EU truck fleet.

2.3 Buildings

Commercial and residential buildings account for half of the EU's gas consumption and progress towards renovation and electrification remains slow. In residential buildings and collective heating systems, heat pumps can fully cover space heating, cooling and hot water needs- about 80% of energy use. The EU renewable energy framework foresees simplified permitting rules for their installation. Electrifying energy consumption in buildings and improving their energy performance leads to multiple benefits for consumers, from lower bills to a healthier indoor environment. The switch from gas boilers to heat pumps can cut the EU household's heating bill by 20% to over 60%[66]. The benefits of heat pumps can also increase if combined with solar photovoltaic, solar thermal, ambient or waste heat and cold and other clean energy or storage solutions such as batteries, including through local heat networks. An efficient and decarbonised building stock would also cut peak demand, thus helping to lower costs across the wider energy system. With longer and more intensive heat waves, heat pumps have the additional advantage, on top of heating, of providing cooling capabilities, with a high efficiency contributing to improve EU climate resilience. Shifting heating or cooling demand

[63] Directive - 1999/62 - EN - EUR-Lex. Member States may provide for reduced tolls or user charges, or exemptions from the obligation to pay tolls or user charges for: zero-emission vehicles with a technically permissible maximum laden mass up to 4,25 tonnes, any vehicle covered by the conditions set out in Article 6(2), points (a) and (b) (notably national or civil defence cars, or cars that only occasionally use public roads), or any vehicle used or owned by persons with disabilities.

[64] 60% of new cars in Europe are purchased by corporate entities. Proposal for a Regulation on clean corporate vehicles COM(2025)994.

[65] Transport and Environment - Weak corporate car taxes risk intensifying the EU's oil dependency, 31 May 2026

[66] "5 things you should know about heat pumps", DG ENER article of 5 Dec. 2025

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from peak hours to hours with high renewable production would decrease the overall costs of the energy system while maintaining thermal comfort. However, the cost of acquiring and installing a heat pump can vary widely across and even within Member States. Social leasing and other support measures, including subsidies, zero- or low-interest loans, and on-bill financing schemes for heat pumps and other clean energy and heating products, can facilitate the transition of low- and middle-income households away from fossil-based heating systems. Cohesion Policy funds, Social Climate Fund, the Modernisation Fund and Recovery and Resilience Plans can support the electrification of buildings, such as in Belgium, where some social housing units are being equipped with a combination of solar panels, batteries and heat pumps.

The Commission will explore ways to mobilise public demand for heat pumps, including under the public procurement, for example by bringing public buyers into a community of practice to coordinate and consolidate their demand while strengthening the value chain through Made in Europe requirements.

To deliver meaningful cost savings and other benefits for consumers, deployment of these technologies should be coordinated with building insulation and renovation, prioritising the worst-performing buildings. Member States have an opportunity to structurally transform their building stock into zero-emission buildings, with their National Building Renovation Plans. The Energy Efficiency Financing Coalition can help scale up private financing for renovations, as well as the good use of revenues generated by ETS2.

Action 9

The Commission will

- *explore the possibility to introduce a **clean heat market mechanism** to incentivise rising shares of heat pump sales from manufacturers, redirect installers and manufacturers to clean heating and cooling solutions and boost competition, narrowing the upfront costs difference for heat pumps by 2027;*
- *examine ways to **accelerate deployment of heat pumps in public buildings** through public procurement;*
- *to ensure heat pump cost transparency, **facilitate the rollout of national online comparison tools** allowing consumers to easily secure a tailored, transparent and comparable "heat pump quote" from different brands and installers;*
- *promote **innovative financing and business models** for heat pumps within integrated packages of renovation and adaptation works in residential buildings through the Better Homes Partnerships, to accelerate uptake, replication and access to finance;*
- *mobilise the **Heat Pump Accelerator platform and the Energy Efficiency Financing Accelerator** to derisk and finance investment in heat pumps and connections to district heating and cooling systems with related to solar thermal and geothermal projects;*

- *adopt a **Cooling and Heating Action Plan**, including to address the growing need for efficient cooling for EU citizens and economy.*

KPI: increase installation rate of heat pumps to around 4 million per year in 2030 compared to 2025 of 2.4 million.

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3. Access to infrastructure

To speed up electrification, grids productivity needs to be significantly enhanced. Difficulties in connection and access to the electricity grid, linked to delays in grids build-out, is another clear constraint on electrification. The EU has already taken action to address this with transparency in grid hosting capacity, flexible connection agreements and grid connection regimes, including prioritisation frameworks or anticipatory investments. In addition, the Grids Package proposed new measures on grid planning and productivity through grid-enhancing technologies and smart solutions. As part of the package, measures on electricity grids and renewables permitting, storage or recharging points are also under negotiation by co-legislators.

Member States should boost investments in grids and streamline permitting in the acceleration areas created by EU legislation. System operators are encouraged to involve in their network planning and grid capacity expansion processes the key actors in electrification investments, including industrial sites and parks such as the Industrial Manufacturing Acceleration Areas, data centres, district heating operators, charging point operators, airports and ports. The mid-term review of Cohesion Policy resulted in additional resources allocated by Member States to investments in electricity grids and interconnectors (1.2 billion EUR)[67]. With a consistent application of the energy efficiency first principle across all infrastructure planning processes, these developments will help lower system costs and improve grid productivity and access. In the context of the Clean Energy Investment Strategy[68], the European Investment Bank intends to deliver over €75 billion of financing over the 3 years, with grids as a key priority.

Member States should also help improving the interface between the electricity grids and users. As regards the expansion of transport recharging infrastructure, multiple measures and support have been provided; as a result, there are now more than 1.1 million publicly accessible recharging points in the EU[69]. While Europe's e-HDV fleet is growing[70], scaling it up requires addressing infrastructure gaps by providing investors and operators greater certainty to unlock investments. The Alternative Fuels Infrastructure Facility focusses on financing recharging e-HDV stations, for which Member States can also make use of regional funds to support these investments. Nevertheless, additional financial support is needed to reassure charging point operators and convince consumers that electric mobility will rapidly become the most reliable and accessible form of transport, even in less densely populated areas.

Port infrastructure has great potential to facilitate the electrification of maritime transport and fisheries through onshore power supply (OPS). The deployment of an adequate high-power charging infrastructure in ports, including small ports in remote areas, remains a priority, while timely integration into grid planning processes, electricity demand forecasting, deployment of energy storage, integration into local energy systems or access to funding can all contribute to turn them into energy hubs. The EU policy framework for ports puts particular focus on the role of OPS and on the potential of ports to become energy hubs[71]. Transparent and non-discriminatory pricing of OPS services is also essential to support this transformation, as well as determining ports as industrial acceleration areas in line with the proposed Industrial Accelerator Act. The Commission invites relevant stakeholders, including within the European Sustainable Shipping Forum, to develop best practices on transparent and non-discriminatory

[67] Inforegio - Results of the Mid-Term Review of cohesion policy
[68] Clean Energy Investment Strategy (COM/2026/116), March 2026
[69] European Alternative Fuels Observatory
[70] In 2026 to date, there are 29,000 battery electric trucks on EU roads, compared to 2,500 in 2020, which is elevenfold increase between 2020 and 2025. In 2025: 28,726 and in 2024: 15,758. Source: European Alternative Fuels Observatory
[71] In particular AFIR, FuelEU Maritime and the March 2026 EU Port Strategy.

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pricing of OPS services, including tariff structures and cost components. If needed, the Commission will take further measures to enhance price transparency and comparability of OPS services across the EU.

Action 10:

The Commission will

- ***review the Alternative Fuels Infrastructure Regulation (AFIR)** in 2026 to further support the accelerated roll-out of charging infrastructure, including for e-HDV, while ensuring no region is left behind. The review will address data collection on current and future needs on depots charging, and further support the accelerated roll-out of OPS;*
- ***update common technical specifications for publicly accessible and private recharging points** under AFIR to ensure technical interoperability and ensure bi-directional recharging capabilities;*
- *ensure a **coordinated European deployment of e-HDV charging infrastructure** as part of the whole value chain approach to e-HDV in 2026 and expand e-HDVs Clean Transport Corridors initiative to other TEN-T corridors, and design with Member States a European financial tool for the derisking of investment in e-HDV recharging stations;*
- *work with Member States and industry to **identify remaining enabling conditions for the deployment of zero-emission HDVs**, including incentives for the demand for the vehicles and agree on joint action plans for the enabling framework for the transition under the 2030 CO2 targets for HDVs;*
- *work on **removing barriers for the electrification of ferries and inland navigation vessels**, such as lack of recharging infrastructure in ports.*

*Member States should consider the frontloading of credits under the **RED credit mechanism** to facilitate investment in recharging points, including depots charging[72].*

KPI: By 2040, deployment of sufficient port grid capacity and shore-side charging infrastructure to enable battery-electric propulsion for one third of the EU ferry fleet.

District heating and cooling (DHC) systems using heat pumps or e-boilers, urban heat networks and thermal storage can offer large amounts of flexibility and reduce the burden on the electricity grid. They can mobilise direct sources of clean heat (geothermal and solar thermal, waste heat[73]) to complement electrification. The Commission will support investments in DHC and waste heat recovery projects, address the lack of awareness by promoting replicable approaches to match supply and demand and promote technical capacity at local level.

Action 11:

The Commission will

- *launch an **EU Waste Heat initiative** to provide investment certainty and support business models for waste heat recovery and use in DHC (by Q2 2027);*
- *mobilise the Energy Efficiency Financing Coalition and the Energy Efficiency Financing Accelerator to **derisk and finance DHC investment** and strengthen the EU supply chain;*
- *support the **European City Facility to fund municipal heating and cooling plans** and launch by in summer 2026 a first pilot action of EUR 15 million funding up to 180 plans*

[72] While ensuring that the credits that have been frontloaded are cancelled if the corresponding renewable electricity is not finally supplied.
[73] The Commission set the objective to supply 11% of EU heat demand from waste heat recovery by 2050

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launched, with the aim to expand to turn 1000 local heating and cooling plans into investible business.

KPIs: Supply 11% of EU heat demand from waste heat recovery by 2050; DHC systems to supply 15% of total heating and cooling supply by 2030 and DHC networks to grow 6-7% per year by 2030.

4. Accelerating innovation in electrification solutions

With constantly improving solutions, electrification technologies cover an ever-larger spectrum of the EU's energy needs. The majority of today's fossil fuel consumption can be electrified, but there are still some energy uses and processes which require further research and innovation, in particular long-distance transport and certain industrial processes. The EU already commits EUR 18.6 billion to support the development of electrification technologies, through Horizon Europe, the Modernisation Fund and the Innovation Fund. For 2026-2027, Horizon Europe dedicates almost EUR 2 billion to address issues such as energy storage, new breakthrough energy technologies, renewable energy, grid technologies and energy systems, electrification of buildings and industry, heating and cooling and solutions for the transport system. The Commission also supports innovative nuclear technologies, including through small modular reactors (SMR) to deliver clean electricity to industrial consumers in a safe way, as reflected in the EU's SMR Strategy[74].

Digitalisation, data sharing and AI are drivers of innovation in electrification solutions and key enablers of demand-side flexibility, including vehicle-to-grid (V2G), heat pumps and buildings. In addition, full decarbonisation of some industrial processes would require the development of other options, such as the use of biogas, hydrogen or carbon capture utilisation and storage.

The regulatory, infrastructure, and operational requirements for electric aviation demand real-world testing. The Commission will launch a pilot to establish regional centres of excellence for zero-emission aviation, bringing together Member States, regions, and the industry.

Action 12:

The Commission will

- ***reinforce within the SET Plan the support of the uptake of clean energy technologies central to electrification of certain industrial processes****, by developing and endorsing Common Investment and Implementation Plan for these technologies by Q1 2027;*
- *work with the* ***European Industrial Alliance on SMRs to conclude the second call*** *for projects in the context of the objective of first SMR projects becoming operational in Europe by early 2030s;*
- ***update the EU hydrogen strategy*** *to ensure the availability of complementary decarbonisation solutions for industrial processes where direct electrification is not feasible or cost-effective.*

[74] COM/2026/117

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5. Aligning value chains with the ambition: Skills and manufacturing

Reaching the EU's energy goals, increasing electrification, modernising infrastructure and ensuring the security of the growing electricity system is challenging. Delivering on the targets and KPIs requires skilled human capital and action all along Europe's value chains; growing and diversifying access to materials, scaling up manufacturing capacities, constantly developing labour supply and stimulating demand. The workforce in the energy sector is projected to increase by 50% by 2030 to deploy renewable energy, grid and energy efficiency technologies.[75] On the manufacturing side, the needs assessment accompanying the Net-Zero Industry Act projects 30,000–100,000 additional jobs by 2030 to produce wind and solar technologies. The largest employment effect materialises downstream. The installation and deployment of wind and solar generation could require a further 130,000–145,000 skilled workers by 2030, around 90% of them in construction and services[76]. Investment in distribution grids alone is estimated to sustain 440,000–620,000 quality, local jobs per year[77] while the IEA identifies the shortage of skilled grid workers as an emerging bottleneck for delivering new infrastructure on time[78].

Beyond the deployment phase, electrification assets generate lasting employment: a study commissioned by the JRC projects close to 110,000 ongoing operation and maintenance jobs for charging infrastructure alone.[79.] The European Centre for the Development of Vocational Training (Cedefop) points to employment gains in machine operation and in metal, machinery and electrical trades — occupations mainly supplied through vocational education and training, confirming its centrality to the electrification workforce[80].

The IEA further estimates that the EU needs 500,000 skilled workers, up from 165,000 in 2024, to deliver on its heat pump installation ambitions. In view of the shortages, there is a need for substantial skilling and upskilling. Under the Union of Skills, the EU provides a comprehensive framework to support skills development, including funding[81]. The EU Council Recommendation on human capital calls on Member States to address skills shortages by investing in STEM education[82]. Further actions can still help. The diversity of certification and permit systems across Member States also represent a barrier to the development of an EU market of installation and maintenance of electrification solutions.

Action 13:

The Commission will:

- ***support Member States and industry in the context of the upcoming European Strategy for Vocational Education and Training (VET)*** *with a stronger sectoral focus and awareness raising to attract a new generation of skilled workers across the electrification value chain;*

[75] Union of Skills, COM(2025) 90 final.
[76] Fulvimari, A. et al. (2025), Estimating labour market transitions and skills investment needs of the green transition
[77] Eurelectric/E.DSO, Connecting the dots: Distribution grid investment to power the energy transition (Monitor Deloitte analysis), January 2021 — figure covers EU27 and UK.
[78] IEA, World Energy Employment 2025
[79] CE Delft (2026), Labour demand energy transition
[80] Source: Cedefop scenario modelling (Skills Forecast 2026)
[81] European Social Fund Plus and Erasmus+ (including the Platform for Electrification Skills), Large-Scale Skill Partnerships on Renewable Skills and on the Digitalisation of the Energy System, battery and net-zero industry skills academies and the EU Talent Pool.
[82] Council Recommendation on human capital in the European Union, ST 6081/1/26 REV 1

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- *adopt **an initiative to support the portability of qualifications and skills across the EU**, including dual use technologies and cyber protection applications for electricity grids;*
- *provide through the Clean Heat Market Mechanism sufficient **incentives for manufactures to support training of electricians and installers through vocational and educational training partnerships** between companies and technical schools to share equipment and develop real-life cutting-edge equipment;*
- *explore support for **access to certifications for energy-efficient construction and installation services and electrification by design** in the upcoming Construction Services Act.*

The EU is among the global leaders in manufacturing the technologies this electrification transition needs. Minimising cybersecurity risks for the electricity grid also needs to be addressed and requires greater use of homegrown technology and suppliers for key IT assets such as inverters.

Building on the Net-Zero Industry Act, the Commission proposal for an Industrial Accelerator Act steers public investments in electrification towards resilient and "Made in EU" products, so European manufacturers can benefit from and lead Europe's electrification efforts. To contribute to this effort, Member States are encouraged to advance their application for electrification technologies.

The European SMR Industry Alliance is taking steps to increase the capacity of the EU SMR industry; and Italy used at least EUR 400 million from its RRP to establish the "Net Zero Technologies" Facility, mobilising private investment in clean technology manufacturing such as batteries, solar and wind and clean heating and cooling technologies. Member States also allocate resources to research, innovation, knowledge-sharing and technology transfer to other companies across clean tech value chains under the Strategic Technologies for Europe Platform (STEP) - EUR 15.2 billion under the new competitiveness priority[83]. Similar actions are needed across the EU for all clean energy technologies. More generally, strengthening the single market and Energy Union will improve the competitiveness of industry and the development of dynamic and integrated markets based on harmonised rules.

Where feasible, electrification can also create opportunities for Europe's maritime manufacturing base, in line with the EU's industrial maritime strategy's 2030 vision[84], serving as a lead market for the uptake of electric ferries, barges and tugboats. The Commission will also cooperate with Member States and stakeholders in the upcoming EU Industrial Maritime Value Chains Alliance.

Action 14:

The Commission will

- ***adopt guidance on NZIA provisions on public procurement procedures** for net-zero technologies.*
- *create an **Electrification Action Plan Alliance** with national authorities in synergy with the Energy Union Task Force and bringing together all stakeholders across the value chain with a special focus the swift electrification.*

[83] Inforegio - Results of the Mid-Term Review of cohesion policy
[84] COM/2026/111 final.

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6. Accelerating clean electrification globally

Clean electrification globally helps to advance international climate action. IRENA estimates that "to remain on a 1.5°C-compatible pathway, electricity must account for 35% of global total final energy consumption by 2035 and more than 50% by 2050". The European Commission, the COP30 Presidency (Brazil), the COP31 Presidency (Australia, Türkiye), the COP32 Presidency (Ethiopia), Canada, the Philippines, the Republic of Korea, the United Kingdom, the International Energy Agency and the International Renewable Energy Agency, joined forces with international partners and industry to launch 'Electrify Now' on 23 June 2026, a global platform to accelerate the electrification of the global economy.

Global clean electrification will be accompanied by substantial socioeconomic benefits from a massive build-out of infrastructure, the global scaling up of manufacturing capacity and cost reductions for clean technologies. It can also create export markets for European innovations and technologies, while early development and international promotion of technical standards can give European companies a head start on export markets.

Finally, electrification helps shift globally from a fragile energy security landscape based on fossil fuels extraction towards a cleaner, resilient, predictable system based on technology cooperation. Especially for energy-poor nations, clean electrification can alleviate the effects of conflict and instability multipliers, such as the collapse of networks and fuel price volatility, and foster regional economic stability.

In line with the Joint Communication on the EU global climate and energy vision[85], global clean electrification is part of the EU's international strategy to secure Europe's competitive role in world markets.

Action 15:

The Commission will

- *seek to unlock ambition across all regions of the globe with its partners of the **Electrify Now Initiative** by showcasing successes, identifying opportunities, securing commitments and strengthening delivery plans;*
- *build a wide **coalition of countries that are willing to commit to global clean electrification**, rooted in the tripling of renewable energy capacity globally and the new global objectives to reach 35% of electrification by 2035 promoted by the COP31 presidency.*

[85] JOIN/2025/25 final.

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Annex I – Matrix of barriers and actions for the industry, transport and buildings sectors

(*Actions are preceded by the action box number*)

	Industry	Transport	Buildings
Barriers			
Unfavourable electricity-fossil price ratios	X	X	X
High upfront costs	X	X	X
Long delays to access the electricity grid	X	X (for charging stations)	
Innovation still required for certain uses	X	X	
Skilled workforce shortages	X		X
Actions			
Sector-specific actions	2. Methodology to assess industrial flexibility potential	2. V2G Regulatory sandbox	9. Clean Heat Market Mechanism
	2. Common Union rating scheme for data centres	2. Smart charging by default in contracts	9. Acceleration of deployment of heat pumps in public buildings

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	Industry	Transport	Buildings
	4. GeoDep tool for energy-intensive industries	2. V2G requirements for new EVs	9. Facilitate the rollout of cost comparison tools for heat pumps
	7. ETS Directive revision to incentivise electrification	8. Revision of Clean Vehicles Directive	9. Better Homes Partnerships roll-out
	7. ETS funds: IDB and Investment Booster	8. Recommendation on demand-side incentives for zero-emission vehicles.	9. Derisk and finance heat pump investments through Accelerators
	7. Second industrial heat auction	10. Review of AFIR on charging stations, depots charging and onshore power supply	9. Adopt a Cooling and Heating Action Plan
	7. Examine the case for an EU-level mechanism on industrial electricity demand	10. Update technical specifications for interoperability and V2G	11. European City Facility
	7. Sector-specific electrification roadmaps	10. RED credit mechanism frontloading	13. Skills in Construction Services Act
	7. Cluster-based partnerships	10. expand e-HDV charging infrastructure clean transport corridors and enabling framework for e-HDVs	
		10. Identify remaining conditions for deployment of zero emission HDVs, and joint action plans	

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	Industry	Transport	Buildings
		10. Remove barriers for the electrification of ferries and inland navigation vessels	
	7. Potential and barriers for deploying direct-use renewable heating technologies	Annex II. Guidance on social leasing	
Cross-sector action	12. Hydrogen Strategy update		11. Derisk and finance District Heating and Cooling investments
	9. Derisk and finance District Heating and Cooling investments		11. EU Waste Heat initiative
	11. EU Waste Heat initiative		
Horizontal and supply side actions	1- Electrification target		
	12. Electrification Action Plan Alliance		
	2. Legislative proposal on future-proof electricity bills, including provision regarding the tax differential between electricity and gas;		
	3. Measures on progressively phasing out fossil fuel subsidies		
	2.Proposals on network codes adoption and revision		
	2. Implementation of the Tripartite Agreement on Storage		
	2.High-level conference to assess barriers and solutions for storage		
	2. Assessment of the EU's long-duration flexibility needs for 2030, 2040 and 2050		
	4. Support for MSs to implement the Renewable Energy Directive		

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	Industry	Transport	Buildings
	4. Support for cross border cooperation for faster nuclear reactor licencing		
	4. Review EU legislation for conclusion of long-term cross-border electricity contracts		
	4. Renewable energy auction design database		
	4.NZIA guidance on non-price criteria for renewable energy auctions and 14. On Public procurement		
	5. Geothermal Stakeholder Partnership		
	6. Make use of the options already laid down in the VAT Directive		
	12. European Industrial Alliance on SMRs second call for projects		
	12. SET Plan Common Investment and Implementation Plan for clean technologies, including innovation in industrial processes		
	13. In the upcoming European Strategy for Vocational Education and Training (VET), stronger focus on skills across electrification value chain		
	13. Skills portability initiative		
	15. Electrify Now Global Initiative		

Annex II – Guidance on social leasing and support schemes for clean energy, cooling and heating products

1. Introduction

Social leasing can be an effective system to increase the uptake of clean energy, heating and cooling products. A social leasing scheme usually means a government-backed programme providing low- and middle-income households with affordable, subsidized long-term leases to help with high upfront costs of products. It can cover, for example, battery electric vehicles (BEVs), heat pumps, photovoltaic (PV) installations, solar thermal installations and batteries. Unlike conventional leasing, social leasing schemes are publicly supported to meet broader social and environmental policy goals at the same time. They make low-emission mobility and energy-efficient solutions more accessible[86].

Switching to clean technologies implies an upfront investment, the operating costs are usually low. While most often, technologies such BEVs and heat pumps pay off over time through lower energy bills, the households that would benefit most often cannot afford the initial investment. This leaves them locked in inefficient and increasingly costly fossil-fuel system. Social leasing breaks this lock-in by replacing high upfront costs with affordable monthly payments, which can be partly offset by lower running costs, making clean technologies more accessible. Social leasing schemes can build lasting public support for the transition.

To provide suitable incentives for the uptake of clean and energy efficient energy, heating or cooling products, such as heat pumps, larger PV installations, social leasing schemes should be designed in accordance with the type of product, e.g. movable or non-movable product. To address specificities of some fixed energy assets, additional support schemes suitable for non-movable products, including subsidies, low- or zero-interest loans, standardised rent surcharge mechanisms, and on-bill financing, could be considered.

2. Social, economic and environmental benefits of social leasing and support schemes

Building on the experience of existing schemes in Member States, social leasing schemes for BEVs can deliver substantial social and environmental benefits. Across the EU, more than 90% of around five million low and lower-middle income households in rural areas with high transport expenditures would financially benefit from a social leasing scheme for BEVs[87]. Receiving a monthly lease rate of approximately EUR 100 for electric mobility, households with high transport needs could save around EUR 1,800 in Spain, and EUR 1.300 in Germany. In addition, each BEV, replacing an equivalent internal combustion engine vehicle, could reduce direct emissions by about two tonnes of CO2 in the first year and around ten tonnes over its full use period[88].

[86] The Clean Industrial Deal announced guidance on social leasing for EVs, heat pumps and other clean energy and heating products, COM(2025) 85 final. Other Initiatives including the Industrial Action Plan for the European automotive sector (COM(2025) 95 final), the Citizens Energy Package (COM/2026/115 final.) and AccelerateEU (COM(2026) 370 final.) refer to social leasing and similar financing support schemes.
[87] Commission estimations based on Green EUROMOD.
[88] Commission estimations that do not account for emissions related to EV production. Estimates account for the general trend towards road transport electrification and quantify the additional potential of a social leasing scheme.

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Switching to a heat pump can also deliver significant savings under the right conditions, as well as more resilience to heatwaves. A subsidy scheme[5] covering the costs of the heat pump installation and targeting households with high energy expenditures relative to their income in the lower half of the income distribution would generate savings for around two-thirds of beneficiaries (16 out of 23 million households). Among these households, average savings could exceed 2% of disposable income, but with strong country variation. In the Netherlands, annual savings can reach around EUR 800. In Croatia, they are closer to EUR 100[89]. Benefits are higher where the ratio of electricity prices to fossil fuel prices is low. However, savings also depend on the efficiency of the heat pump system, which is influenced by factors such as the required water temperature in the heat emitters and how well the buildings are insulated. The measure would also deliver clear environmental gains: Replacing a fossil- fuel based heating system with a heat pump could cut direct emissions by around 4 tonnes of CO_2 per year per household in the target group.

French social leasing scheme

French social leasing allows most modest households to have an BEV by paying a monthly rent, without being obliged to purchase it at the end of the lease. The lease must last at least 3 years. This mechanism was first introduced in 2024, and it was renewed for a third edition in July 2026.

The amount of rent to be paid depends on the car model, amounting to less than €200 per month for a mileage of at least 15,000 km/year at no additional cost (this does not include the cost of insurance, nor the price of options or additional services).

The aid granted shall be equal to 29% of the purchase cost of the vehicle up to €6,500.

This limit may reach a maximum amount of €9,000 whether the vehicle manufacturing site and the battery production site are located in the European economic area. If the electric motor was manufactured in the European Economic Area, a flat-rate surcharge of €500 may be granted.

3. **Designing social leasing and support schemes and financing options**

Commission's action

The Commission will monitor the uptake and impact of social leasing and support schemes for clean energy, heating and cooling products. It will do so through the European Fair Transition Observatory, a flagship initiative under the Clean Industrial Deal. Monitoring may include elements moving from uptake, and socio-economic profile of beneficiaries, to potential household savings and emission reductions.

The Commission will also support Member States in channelling revenues under the Social Climate Fund to social leasing schemes.

Member States' actions

Design of the scheme and financing options

[89] Corresponding to 4% of income in the Netherlands and 1% of income in Croatia.

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Social leasing

In designing social leasing schemes for BEVs, PV installations, heat pumps, solar thermal installations and batteries, Member States could promote a standardised model that offers:

- A two-part subsidy: A fixed amount for all households, plus an additional income-based top-up. This ensures lower-income households receive more support and can afford the resulting monthly payments. Monthly payments could be calibrated at the country level so that, for the typically targeted household, the lease payment combined with running costs is expected to be lower than the current expenditure on the fossil-based alternative.
- Bundled monthly payments (e.g. installation, maintenance, insurance, repair).

Social leasing type of financing for non-movable technologies

In designing support schemes beyond social leasing, Member States could consider the following options and combinations thereof:

- Subsidies to reduce upfront costs, with higher support for lower-income households.
- Low- or zero-interest loan schemes with repayments capped at an affordable share of households' incomes (e.g. ≤5% of monthly earnings).
- On-bill financing, where installation costs are covered upfront and repaid over time through a small charge on the (lower) energy bill (pay-as-you-save). Repayment instalments could be set below the expected energy bill savings, so that beneficiaries see a net reduction in monthly expenditure from the start of the scheme. Where schemes rely on projected rather than actual energy savings, safeguards should be introduced to prevent households from bearing any shortfall[90].

Additional financing aspects

- Member States are encouraged to put in place measures and investments to finance social leasing and other support schemes, drawing on EU funding under the Social Climate Fund as well as to use their revenues from ETS2.[91]
- Member States are encouraged to ensure long-term stability of the social leasing and other support schemes by securing multi-year funding commitments and establishing public-private partnerships for scalable, predictable delivery.
- For schemes run by private providers, Member States could reduce the risk through public guarantees and encourage the use of government-backed loan guarantees, low- or zero interest loans, and tax breaks (e.g., reduced VAT) to attract providers and lower costs.

Eligibility criteria for beneficiaries

[90] In Latvia, the LABEEF scheme applies a similar logic for building renovations, where costs are repaid over time through energy payments, linked to achieved savings and without upfront household investment. On-bill financing has also been recommended under Commission Recommendation (EU) 2026/537 on unlocking private investment in energy efficiency and by the Energy Efficiency Directive (Directive (EU) 2023/1791).

[91] See Regulation (EU) 2023/955 establishing a Social Climate Fund and AccelerateEU (COM(2026) 370 final.).

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- Member States are encouraged to target support primarily at low- and middle-income households that would otherwise be unlikely to switch to clean energy, heating and cooling products.
- The income-based targeting could be combined with additional criteria:
  - Social leasing schemes for BEVs could prioritise households with high expenditure on private transport, such as those in rural or remote areas with limited public transport and high mobility needs.
  - Social leasing and support schemes for clean energy and heating products in the building sectors could target households reliant on carbon-intensive heating (e.g. oil, coal, old gas boilers) that are not within reach of an existing or planned district heating system[92]. Social housing and households with obsolete heating equipment could also be prioritised.
- Member States could extend support to micro-enterprises and social economy actors with high energy or transport needs.

Technical, social and environmental requirements for clean energy, heating and cooling products

- Member States are strongly encouraged to apply Made-in-EU requirements in line with the proposed Industrial Accelerator Act, by setting local content rules to boost EU manufacturing and jobs. In this way, social leasing schemes can also provide a stable and predictable demand signal for EU manufacturers of BEVs, heat pumps and PV components.
- Member States are required to apply the resilience and sustainability requirements from Article 28 of the Net-Zero Industry Act to social leasing and support schemes of net-zero technologies[93].
- As regards BEVs Member States are encouraged to:
- Prioritise support for vehicles under the Small Affordable Cars initiative, covering BEVs with up to 4.2 metres in length[94], and grant exceptions for larger families and people with disabilities.
- Assess the inclusion of second-hand BEVs to improve accessibility and cost-efficiency.
- Assess whether to link BEV support to scrappage schemes which require retirement of internal combustion engine (ICE) vehicles.

Terms and conditions of social leasing and other support schemes

To ensure high uptake of social leasing and other support schemes Member States could:

[92] Local heating and cooling plans will provide a reference in municipalities above 45,000 inhabitants.
[93] https://eur-lex.europa.eu/eli/C/2026/123/oj
[94] European Commission (December 2025) – Commission takes action for clean and competitive automotive sector.

- Reach and support targeted households through awareness campaigns, personalised guidance, and clear information on how schemes can be combined with other grants or incentives.
- Ensure simple application processes with minimal paperwork, supported by one-stop shops[95], and allow providers to handle applications on behalf of households to speed up access. Where possible, eligibility verification should rely on data already held by public administrations (e.g. tax or social security records) rather than documentation requirements placed on applicants.
- Develop user-friendly contracts that transparently include all costs and termination procedures. In the case of social leasing, include an option to purchase the asset at the end of the lease period at a predefined residual value.
- Include expert guidance on building technology choices (e.g., better insulation, larger heat emitters, proper size and choice of heat pumps) to ensure solutions match household needs and building efficiency.

Complementary measures

Member States could combine social leasing and support schemes for clean energy, heating and cooling products with complementary measures and investments to maximise uptake and improve affordability. For example:

- Consider preferential electricity tariffs to reduce operating costs, alongside broader efforts to lower electricity prices (e.g. by reducing taxes and levies) and remunerate flexibility.
- Consider support for shared PV installations and solar thermal, batteries, and heat pumps for households in multi-apartment buildings and small communities.
- Ensure that renters can benefit from clean energy, heating and cooling products by addressing landlord-tenant split incentives (e.g. through regulation or targeted incentives for landlords), while protecting tenants against unjustified rent increases or eviction linked to upgrades.
- Consider linking BEV social leasing to subsidised home chargers and access to affordable public charging networks to reduce overall running costs.
- Where relevant, pair support for heat pumps with energy efficiency renovations and PV installations.
- Where relevant, pair support for PV installations with batteries to maximise self-consumption, reduce reliance on grid electricity, and lower energy bills, especially during peak hours.

As regards heat pumps, Member States are encouraged to consider social leasing schemes in their climate adaptation plans, as reversible heat pumps can provide affordable cooling for vulnerable households during heatwaves.

[95] European Commission - One-stop shops - renovation and energy efficiency - Energy.

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Overall implementation

In terms of implementation, Member States are encouraged to monitor and assess the impact and implications of the comprehensive set of social leasing and support measures. This is important to ensure overall consistency between the different measures, i.e. to avoid duplication and overlaps, and to ensure cost-efficient policies.

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