

## **EREF input to the public consultation on the Electrification Action Plan**

Brussels, 09 October 2025

EREF welcomes the opportunity to provide input on the forthcoming Electrification Action Plan. We strongly support the Commission's ambition to accelerate electrification as a central driver of the Clean Industrial Deal and of the Action Plan for Affordable Energy.

Electrification will be indispensable for reaching Europe's 2030 and 2040 climate and renewable energy targets, for strengthening competitiveness, and for significantly reducing fossil fuel dependency. However, the benefits of electrification can only be realised if it is firmly based on renewable electricity, embedded in a broader system perspective, affordable and complemented by other renewable energy technologies. It must also go hand in hand with a strong increase in energy efficiency, as the two are mutually reinforcing pillars of the transition.

EREF's position is clear: electrification must be pursued wherever it is the most efficient solution, but it needs to be viewed holistically. A resilient, affordable and socially supported transition requires all renewable energy sources, in particular wind, solar (PV and solar heat), bioenergy, geothermal, hydropower, biogas and biomethane, other renewable gases such as green hydrogen and RFNBOs, integrated alongside energy efficiency, different types of storage, and a range of flexibility options.

### **Alignment with the EU energy transition**

Electrification offers a unique opportunity to strengthen Europe's energy sovereignty, security, and competitiveness. When powered by renewables, it reduces exposure to imported fuels, stabilises long-term energy costs, and enables new value chains across sectors such as mobility, buildings, and industry. Electrification can also empower citizens and SMEs to become active energy participants, fostering innovation, flexibility and demand-side efficiency. Combined with smart grids, digitalisation, and storage, it can make Europe's energy system more sustainable, more resilient, and more inclusive and democratic.

The Electrification Action Plan must be fully consistent with the Union's wider climate and energy objectives. It should accelerate, and never delay, the transformation to a fully renewable energy-based system. Higher levels of electrification should only be delivered by more renewable electricity and energy efficiency to ensure defossilisation and affordability.

Recent projections show that neglecting this balance risks increased fossil generation and rising CO<sub>2</sub> prices, with significant costs for households, industry, and competitiveness. In Germany, for example, the German Renewable Energy Federation (BEE) estimated in 2025 that if insufficient renewable electricity is available for defossilisation, CO<sub>2</sub> prices in all sectors (heating, electricity, transport and industry) would rise sharply, resulting in additional costs of €29 to €68 billion per year in Germany by 2030.<sup>1</sup> For households, this would mean an average increase of €1,080 to €2,250 in annual energy costs, while companies would face substantial additional expenditure for emission allowances in the EU Emissions Trading System.

Moreover, energy efficiency must be a core pillar of the Electrification Action Plan. The most sustainable and affordable kilowatt-hour is the one that is not consumed. Improving efficiency in electricity use across homes, offices, hospitals, agriculture, and industry will reduce overall demand, lower costs, and strengthen system resilience. Efficiency gains can be achieved through measures such as high-efficiency motors and fans, speed-controlled drives, optimised ventilation systems, and advanced control and automation technologies that match supply and demand more accurately. Industrial processes and electrical machinery can be upgraded to operate with higher efficiency, while education, incentives and supportive taxation models can further accelerate uptake. Prioritising efficiency will not only ease pressure on grids but also maximise the value of renewable electricity, ensuring that each kilowatt hour delivers the greatest possible benefit to citizens, businesses, and the climate.

The Commission's proposal to increase the share of electricity in final energy consumption is a crucial step. Yet this must not obscure the fact that renewable heating and cooling, efficiency gains and direct use of renewable energy also remain central. Electrification must therefore be understood as part of a broader strategy that combines

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<sup>1</sup> Bundesverband Erneuerbare Energie e.V., *Update der Strombedarfsanalyse* (1 October 2025) <https://www.bee-ev.de/service/publikationen-medien/beitrag/update-der-strombedarfsanalyse> accessed 3 October 2025.

efficiency, renewables expansion, sector integration and spatial planning to optimise system resources.

### **Electrification in a diversified system**

A successful Electrification Action Plan must recognise the contribution of the full portfolio of renewable energy technologies. Wind and solar PV will provide the backbone of Europe's electricity supply, and they must be complemented by bioenergy, geothermal, hydropower (including pumped storage), solar thermal, biogas, biomethane and renewable gases such as green hydrogen and RFNBOs. Small-scale renewable projects, including small hydropower, must also be supported and safeguarded from disproportionate national implementation, as they are key enablers of decentralised flexibility, resilience, and citizen participation. Only by mobilising the full range of renewable technologies, alongside higher energy efficiency, can Europe ensure a resilient, cost-efficient, and socially supported transition.

A robust and diversified storage ecosystem is indispensable to integrate high shares of renewables and to optimise the utilisation of variable wind and solar PV. Battery storage provides flexibility over intra-day timescales, while pumped-storage hydropower delivers the longer-duration balancing capacity needed to ensure system efficiency over several days or weeks. Thermal storage, renewable gases such as green hydrogen and biomethane, and emerging mechanical storage technologies further enhance seasonal and cross-sectoral flexibility. Ideally, these assets should increasingly operate as hybrid renewable power plants in combination with wind, solar PV, hydropower and other renewables, providing firm, dispatchable capacity and system services across electricity, heating and transport. Recognising and accelerating both short- and long-duration storage across all renewable carriers (electric, thermal and gaseous) is essential to deliver a credible pathway to a 100% renewables-based, resilient, and more affordable energy system.

Higher levels of electrification are important in transport, buildings and large parts of industry. But electrification does not make sense in every sector or application. Hybrid solutions that combine electricity with renewable heat, dispatchable renewables and renewable molecules will deliver a more reliable and affordable pathway. Solar thermal, geothermal and modern district heating provide direct renewable heat that reduces pressure on the electricity grid, lowers system costs and increases resilience.

Storable and dispatchable renewables such as bioenergy, hydropower and biogas and biomethane are indispensable for balancing variable renewable generation and for providing services that electrification alone cannot reasonably deliver. Cogeneration

powered by bioenergy, for example, delivers both heat and electricity precisely when demand is highest, thus supporting affordability and security of supply in winter. Renewable heat from bioenergy also operates independently from the electricity grid, reducing demand-side pressure and complementing electrification.

Industries capable of flexible electricity use, for instance in the production of hydrogen, ammonia or electrofuels, can also play a stabilising role by absorbing surplus renewable generation and substituting fossil-based inputs. These synergies between renewables, flexible demand and storage are essential for building an integrated, reliable and efficient energy system.

Green hydrogen (RFNBOs), alongside other renewable gases, may play an important role in hard-to-abate industrial sectors, in long-haul transport and as long-term storage. Their use must be prioritised where no direct electrification or renewable heat alternatives are available, rather than diverted into sectors where solar thermal, geothermal or other direct renewable solutions offer higher efficiency and lower cost.

When underpinned by a diverse renewable mix, electrification can drastically reduce system inefficiencies, enhance energy security, and stabilise costs.

### **Market design and affordability**

The Action Plan should include measures to rebalance the retail price ratio between electricity and fossil fuels, in line with the indicators introduced under the Action Plan for Affordable Energy. In many Member States, electricity carries a disproportionate burden of taxes, levies and network charges, while fossil fuels continue to benefit from lower taxation and unpriced externalities. This distorts the price ratio, undermines the business case for electrification and slows down the uptake of renewable solutions.

The Action Plan should therefore ensure that renewable energy, and particularly renewable electricity, becomes the most affordable and attractive option for private and industrial consumers. This requires rebalancing taxation, levies and charges, while fully reflecting the environmental and social costs of fossil fuels. At the same time, energy markets must be redesigned to reward flexibility, demand response, storage and hybrid renewable systems, while phasing out incentives for inflexible and emitting capacity.

Prosumers and collective self-consumption must be promoted as core enablers of decentralised resilience, affordability and public support. Their contribution, together with that of SMEs, cooperatives and energy communities, is essential for a fair and inclusive energy transition.

Stable and predictable policies and frameworks are crucial for building and maintaining investor confidence and avoiding stop-and-go measures that undermine deployment. Access to finance and legal certainty must also be ensured for smaller actors, so that decentralised and citizen-driven investments can flourish alongside large-scale renewables. A more equitable price structure will enhance industrial competitiveness and accelerate the electrification of key sectors to deliver the most affordable benefits for households and businesses.

### **Infrastructure, flexibility, and innovation**

Electrification requires massive and coordinated investments in infrastructure. Transmission and distribution grids must be expanded, enhanced, modernised and digitalised, while flexibility options such as demand response, storage, hybrid renewable systems and renewable gases must be scaled up. Infrastructure planning must also integrate renewable heating and cooling networks, sector integration and more decentralised and distributed production and consumption. A coordinated approach across sectors and borders will be essential not only to optimise resources and avoid curtailment, but also to bring down system costs and deliver affordable energy for private and industrial consumers.

The forthcoming European Grids Package will therefore be a crucial companion to the Electrification Action Plan. As EREF has underlined in its response to the Commission, grid connection delays and bottlenecks are among the most pressing barriers to renewable deployment, with curtailment costs ultimately borne by consumers.<sup>2</sup> The Electrification Action Plan must therefore be closely aligned with the Grids Package, ensuring that grid reinforcement, flexibility deployment and system planning proceed hand in hand.

The Action Plan must also deliver a concrete strategy for expanding cross-border transmission capacity, ensuring that regions with renewable surpluses can reliably supply those with deficits, while strengthening resilience and security of supply across the Union.

Innovation will play a decisive role. Early-stage technologies, sector-coupling pilots and novel business models (such as hybrid systems, Power-to-Heat or community self-consumption or energy sharing schemes) must be actively supported even when not

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<sup>2</sup> EREF, Contribution to the Public Consultations on the European Grids Package (Brussels, 1 August 2025) <https://eref-europe.org/eref-contribution-to-the-public-consultations-on-the-european-grids-package/>

yet fully cost-competitive. This requires dedicated funding streams and early-stage support mechanisms that allow promising innovations to move from concept to market without being held back by rigid cost-effectiveness criteria.

At the same time, Europe must invest in large-scale training and skills programmes for installers, engineers and system operators, ensuring that the workforce is equipped to deliver the transition at scale. Cross-border cooperation and demonstration projects should be fostered to integrate flexibility solutions and accelerate system learning.

Finally, the Action Plan should also promote the deployment of alternative flexibility options such as vehicle-to-grid services and emerging storage technologies. Digital solutions can unlock demand-side flexibility and real-time system optimisation. Recognising and rewarding the full system value of flexibility will be essential to complement traditional grid investments and meet local as well as sectoral needs in a cost-efficient and socially fair way.

### **Coordination with the Heating and Cooling Strategy**

Electrification of heating is an important pillar of the transition, but it must be developed in close coordination with the forthcoming Heating and Cooling Strategy. Nearly half of Europe's energy demand lies in this sector, which remains dominated by fossil fuels. Replacing outdated heating systems with renewable solutions is therefore an urgent priority to cut emissions, increase energy security, and address energy poverty.

Heat pumps will play a central role in improving efficiency and phasing out fossil fuels, and their deployment should be combined with renewable sources and storage to optimise system performance and efficient electricity use. Hybrid systems that integrate heat pumps with solar thermal, aqua-thermal (harvesting thermal energy from rivers), bioenergy or geothermal solutions are already proven to provide efficiency, resilience and affordability. Dispatchable and storable renewable heat, in particular from bioenergy, can stabilise the electricity grid during periods of low wind and solar supply and reduce pressure on the demand side of the grid.

Renewable heating and cooling technologies such as solar thermal, geothermal, biomass and modern district heating must therefore be given equal priority alongside electrification. A joint strategy for electrification and renewable heating and cooling is indispensable to deliver a consistent, integrated and socially just transition that strengthens system integration, resilience, and affordability.

## Conclusion

Stronger and more widespread electrification will be a cornerstone of Europe's clean, competitive and integrated energy system. To succeed, the Electrification Action Plan must ensure that higher levels of electrification are powered by renewables, embedded in a diversified and resilient system, guided by energy efficiency, and closely coordinated with renewable heating and cooling. It must create a fair and attractive price framework, reform market design to reward flexibility and efficiency, and invest in infrastructure, skills and innovation.

Under these conditions, electrification will deliver its full potential to strengthen Europe's competitiveness, energy security and climate neutrality.

### **For more information, please contact**

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