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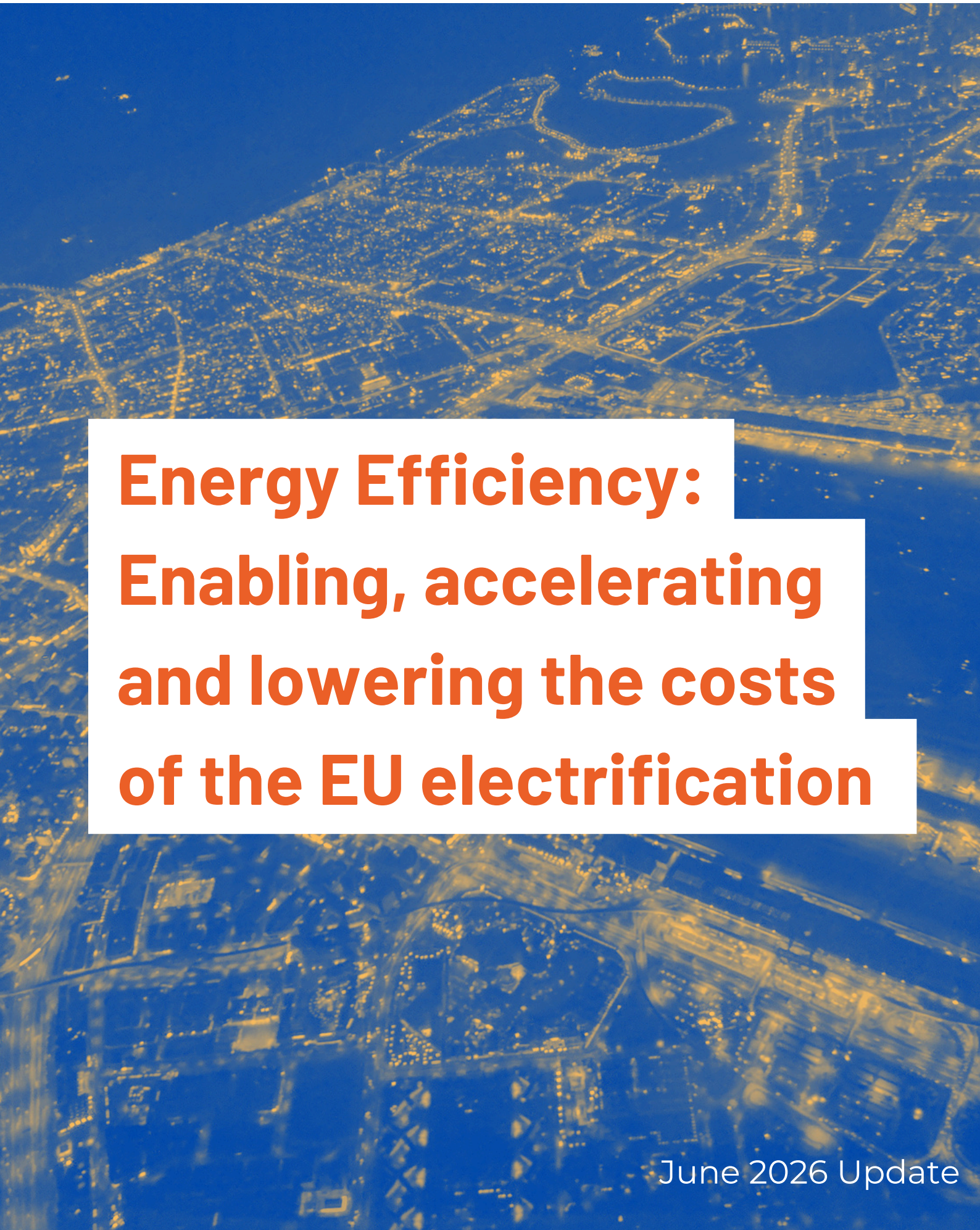

Energy Efficiency: Enabling, accelerating and lowering the costs of the EU electrification

June 2026 Update

Introduction

To improve its energy security, reduce energy costs and achieve climate neutrality, the EU energy system must be progressively electrified. While it is widely accepted that electrification increases energy efficiency, **the role of energy efficiency in accelerating and lowering the costs of electrification is often overlooked.**

As recognised by the International Energy Agency,[1] electrification is a primary driver for improving energy efficiency, especially in advanced economies, enabling a shift away from fossil fuel dependency. However, importantly, by actively reducing avoidable energy demand, lowering peaks and easing pressure on infrastructure, **energy efficiency also supports a more affordable and manageable electrification process, which helps to control energy costs.** Strengthening energy efficiency measures is thus essential for achieving an energy transition that enhances the quality of life for citizens, especially for the most vulnerable, bolsters the competitiveness of EU businesses and makes the EU energy system more independent and resilient to geopolitical shocks.

The current European energy efficiency policy framework, namely the Energy Efficiency Directive (EED), the Energy Performance of Buildings Directive (EPBD) and the Ecodesign regulation, already provides a robust framework to decarbonise and electrify end-uses. With the transposition deadlines of the EED and EPBD now passed, **full implementation of this framework is essential, and must serve as the basis to deliver smarter and cheaper electrification** by integrating demand-side resources in the planning and investment decisions of an electrified, net zero-compatible EU energy system.

Energy efficiency and electrification are mutually reinforcing. Ahead of the European Commission's upcoming Electrification Action Plan, this briefing provides some reflections and supportive data on the contribution of demand side measures to decarbonise and electrify the EU energy system and to achieve a more resilient and energy independent EU.

[1] See IEA – From Taking Stock to Taking Action

1 Energy efficiency and flexibility facilitate the electrification and decarbonisation of the EU energy system

The shift toward electrification and decarbonisation must rely greatly on the deployment of demand-side solutions at end-user levels, notably energy efficiency improvements and flexibility. **They will ensure that the future EU energy system is more agile with reduced stress on the grid and an improved ability to integrate and adapt to variable energy supply.** Crucially, energy efficiency and flexibility work hand in hand. Reducing energy demand through energy efficiency measures, such as building renovations, cuts the energy used by households, therefore decreasing the baseload demand of the system, while increasing citizens' comfort and wellbeing. Meanwhile, flexibility helps manage peak demand by activating and rewarding citizens and industries that shift their consumption patterns at different moments. Energy efficiency measures can also enable flexibility,[2] as energy efficient appliances, heating systems or fabric insulation create supportive conditions to develop demand-side responses in households.[3]

A recent study highlights how demand-side resources are necessary to make the energy system fit for the available clean resources.[4] By adopting ambitious demand-side measures, such as building insulation coupled with heat pumps and energy management systems, seasonal peak demand can be reduced by up to 39% in 2030[5] compared to a scenario without energy efficiency and flexibility measures (see Figure 1). **Therefore, the expansion of the energy infrastructure that would be needed to cope with peaks in electricity demand, including electricity grids, can be moderated[6] by more efficient end-uses and flexible consumers.**

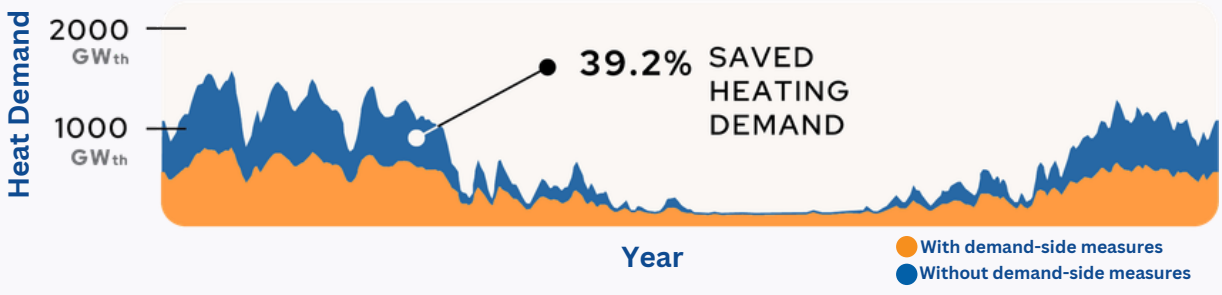

Figure 1: Reduction of seasonal peak demand in 2030 thanks to demand-side resources.

2 See the Coalition for Energy Savings and SmartEN joint statement "Energy Efficiency and Demand-side flexibility: united to make climate neutrality morea affordable"

3 Santini, M., Sunderland, L., Thomas, S. (2024) Right here! Right now! New roles for energy efficiency in an electrified energy system. Regulatory Assistance Project

4 BPIE, 2024, From cost savings to societal gains: rethinking the cost-optimal methodology

5 "Flattening the Peak Demand Curve through Energy Efficient Buildings: A Holistic Approach Towards Net-Zero Carbon". See Figure 4 (a) for the reduction of seasonal peak demand in 2030.

6 In the report "From Taking Stock to Taking Action", the IEA stresses that, "Efficiency policies also limit the need for investment in additional infrastructure such as electricity grids"

This becomes even more relevant in countries that are already congested today. For instance, in the Netherlands, over 14,000 businesses are currently stranded on waiting lists for new or upgraded electricity connections to the electricity grid, causing severe industrial delays and stalling economic growth.[7] Grid constraints are not only delaying industrial electrification – they are also becoming a direct bottleneck for housing delivery. Recent examples from across the EU, such as in the Netherlands,[8] Ireland,[9] Spain,[10] and Germany, show that insufficient electricity access and grid capacity can delay, slow down, or halt new residential development.

Similarly, the deployment of energy efficiency measures could also help to solve the grid connection backlogs that renewable energy projects are experiencing by optimising the existing grid and reducing the need for grid reinforcements. A recent study[11] found that in eight European countries, there are over €100 billion in clean energy projects waiting for connections. Furthermore, energy communities across Europe have also been unable to feed their renewable electricity into the grid: for example, in Greece, 49% of net metering requests in 2022 were denied due to grid congestions.[12]

2 Demand-side measures reduce the infrastructure costs of the EU energy system

The transformation of the EU energy system into one that is compatible with climate neutrality will require substantial public and private investments in upgrading the EU's energy infrastructure while electrifying end-uses. **Energy efficiency ensures that unnecessary supply-side investments are avoided and that the limited financial resources are prioritised for the most urgent infrastructure upgrades, allowing net zero to be reached on time**.

For instance, if ambitious demand-side measures, namely building renovations, are implemented, €250 and €344 billion would be saved in 2030 and 2040 respectively for the creation, operation and maintenance of the EU energy system (i.e. total energy system costs), compared to a scenario without ambitious demand-side measures.[13] In addition, in 2030 and beyond, investment into distribution grids could be reduced each year by about €40 billion.

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[7] See article: 14,000 companies wait for a new Dutch power grid connection - DutchNews.nl

[8] NL Times. (2025). 'Plans for 500,000 homes at risk of delay due to nitrogen and grid constraints'
NL Times. (2026). 'Grid operator warns overload in Utrecht, Gelderland, Flevoland could stop new homes'

[9] The Irish Times. (2025). 'Thousands' of new homes delayed due to electricity access'

[10] Euro Weekly News (2026). 'Spain's housing shortage deepens as electricity grid limits new construction in 31 provinces.'

[11] AFRY, Beyond Fossil Fuels, "Grid expectations: The distribution backlog stalling Europe's energy transition"

[12] See Commission report, "Barriers and Action Drivers for the Development of Different Activities by Renewable and Citizen Energy Communities"

[13] See Table 3 in the study "Flattening the Peak Demand Curve through Energy Efficient Buildings: A Holistic Approach Towards Net-Zero Carbon"

Finally, the costs of grid congestion could be decreased by almost four times in 2030 if demand-side measures are introduced.[14]

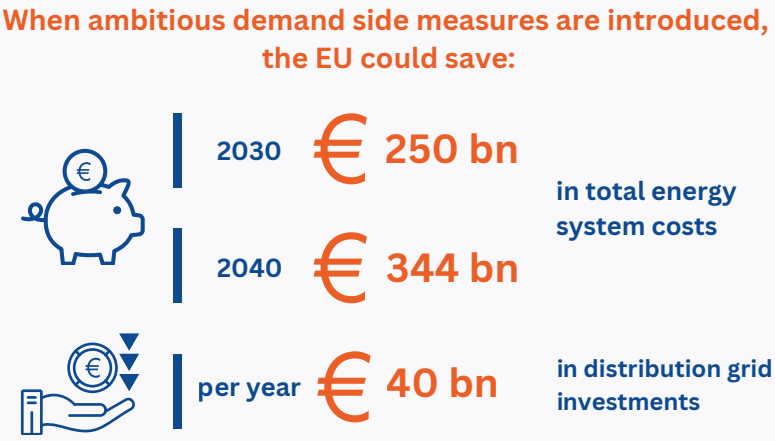

Figure 2: System benefits of ambitious demand-side measures.

Energy efficiency therefore reduces the cost of electrifying the EU energy system, ensuring that the newly installed energy infrastructure capacity needed to meet the EU's energy needs is not unnecessarily oversized.

Demand-side measures help to keep electricity prices in check

Energy efficiency has the potential to enable and facilitate the transformation of the EU energy system, and to drastically reduce the cost of the energy transition for citizens, businesses, and society as a whole.

Thanks to reduced total energy system costs from energy efficiency improvements in the building sector (see previous section), **the average increase in electricity prices in the EU could be mitigated compared to a situation without demand-side measures.**

Indeed, if building renovation and flexibility improvements are disregarded, the price of electricity (in € per MWh) could greatly increase in 2030 (155.27 €/MWh) compared to 2024 values (95.4 €/MWh).[15]

Figure 3: Estimated price of electricity in 2030 without building renovations and flexibility

[14] See Table 12 and Figure 12 in the study "Flattening the Peak Demand Curve through Energy Efficient Buildings: A Holistic Approach Towards Net-Zero Carbon"

[15] See table 19 in the study "Flattening the Peak Demand Curve through Energy Efficient Buildings: A Holistic Approach Towards Net-Zero Carbon

Lower electricity prices are also crucial to help European industries decarbonise their production processes and to reduce the current competitive gap they are facing, including because their Chinese and US competitors are benefitting from lower electricity prices.[16] To support their electrification, the use of existing policy tools is essential, such as the energy audits and energy management systems provision set in Article 11 of the EED.

Demand-side measures reduce energy bills for private households

Lower electricity prices cut energy bills for households, especially when coupled with building renovations. This is particularly relevant given the current context, where energy prices have risen again due to the war in the Middle East, further exacerbating energy poverty.

Energy bills for households are estimated to average €900 per year in the EU in 2030 if ambitious buildings renovation and flexibility measures are deployed, which is a sizeable decrease compared not only to a scenario without energy efficiency measures (€2420 per year), but also compared to the 2023 EU average (€1192 per year).[17]

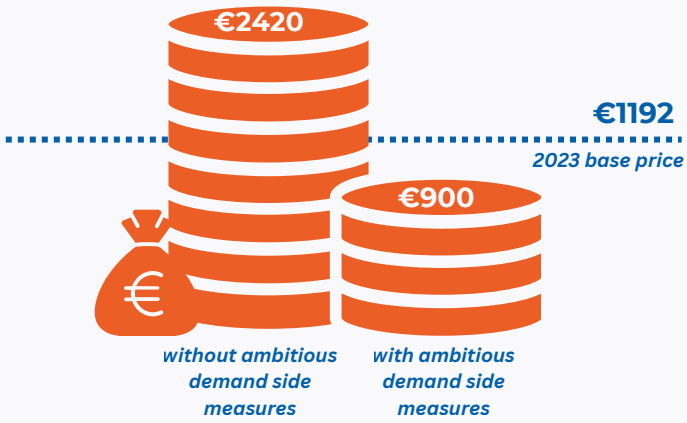

Figure 4: Estimation of annual energy bills for households in 2030.

In addition, beyond reducing energy bills, **building renovations also protect people from energy price volatility, while improving households' comfort and living standards**. Indeed, renovations can yield substantial returns on investment through health-related benefits and increased productivity at work.[18] In parallel, renovations and energy-efficient buildings improve the EU's climate resilience – an extremely relevant benefit in a context where 45% of Europeans feel their homes are not equipped for extreme heat,[19] as also evidenced by the June 2026 heatwave.

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16 As highlighted in the report by Mario Draghi on the future of European competitiveness, the industrial retail power prices are 158% higher in the EU compared to the US, see Figure 6 page 15

17 "Flattening the Peak Demand Curve through Energy Efficient Buildings: A Holistic Approach Towards Net-Zero Carbon"

18 See BPIE report "Healthy Building Barometer 2024"

19 See BPIE report "Healthy Buildings, Healthy Lives"

In that context, supporting households to decarbonise and electrify their heating and cooling systems is essential, also in view of the start of the new Emissions Trading System for heating and road transport. The announced initiative on heating and cooling, regardless of the form in which it will be published, has the opportunity to propose specific measures to address these concerns to support citizens, in particular vulnerable households.

3 Setting the right policy framework to accelerate electrification and energy efficiency

The upcoming Electrification Action Plan, expected this July, must set the way for a competitive, decarbonised, and resilient EU. It must be coherent with both the existing and the post-2030 energy frameworks, both for energy efficiency and renewable energy, due by the end of 2026. As evidenced by the strong synergies between electrification and energy efficiency presented throughout this paper, the **Electrification Action Plan must clearly recognise that electrification and energy efficiency are mutually reinforcing, but not interchangeable.** Electrification can improve the efficiency of energy services, while energy efficiency reduces avoidable demand, lowers peaks, and enables a faster, more affordable and more resilient electrification process.

Existing energy efficiency policies already support the electrification of end-uses across Europe. For instance, the Energy Savings Obligation (Article 8 of the EED) has already started to support heat pump deployment and stopped rewarding energy savings stemming from direct fossil fuel combustion in buildings. Similarly, the energy audits provision (Article 11 of the EED) incentivises industry to electrify and make their processes more efficient. **The Electrification Action Plan must therefore leverage the potential the existing energy efficiency framework has to both reduce energy consumption and improve grid optimisation**. This will lead to lower grid congestions and therefore shorter connection queues. Stronger links between EED implementation, EPBD delivery, heating and cooling planning, and grid planning would support this objective by treating demand reduction in buildings and industry as a system resource.

Crucially, **these considerations must be embedded into the target-setting process for the next decade currently under preparation.** The announced EU electrification target must be defined and designed in conjunction with the EU energy efficiency target. First, the electrification target could be set as a percentage of the EU final consumption, which is defined by the EU energy efficiency target. Second, when dividing the 2040 EU energy efficiency target among Member States, the national energy efficiency contributions could be adapted to reward those countries that are advancing faster on electrification. This would ensure that the electrification and energy efficiency targets are fully complementary and work in synergy to deliver a secure, efficient and decarbonised EU energy system.

Finally, the Electrification Action Plan must be accompanied by a standalone Heating and Cooling Strategy, focusing on advancing the switch to efficient and decarbonised heating and cooling systems in homes and businesses.

Conclusion

As stressed by transmission system operators ENTSO-E and ENTSOG, **"Fast implementation of the efficiency first principle is key to. . .minimise long-term challenges of decarbonising the energy supply"**.[20]

Indeed, the Energy Efficiency First principle has been made a guiding principle of EU energy policies for a simple reason: the multiple benefits of energy efficiency are far-reaching and extend beyond the end-use sectors, such as households, transport and industry; **energy efficiency is beneficial for the energy system as a whole, as it lowers the costs and investments required to provide the energy services needed by citizens and businesses as electrification progresses.**

With the numerous monetary and non-monetary benefits of demand-side measures, including for fast and more affordable electrification, the European Commission must ensure that the upcoming Electrification Action Plan and the Heating and Cooling Strategy are drafted in line with the Energy Efficiency First principle by fully integrating energy efficiency solutions in any future planning exercise.

Energy efficiency is the foundation of a renewables-based, affordable, secure and competitive energy system and must be prioritised as a key resource on par with supply-side options; the Commissions must fully acknowledge it in the Electrification Action Plan and when setting the energy framework for the next decade.

[20] ENTSO-E and ENSTOG TYNDP 2024 Draft Scenarios report

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BPIE

CAN Climate Action Network Europe

CEE Bankwatch Network

ClientEarth

Climate Alliance

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EEB European Environmental Bureau

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