

Fair Allocation of Energy Network Costs

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Introduction

Electricity grids are the backbone of the EU energy system, enabling about 23% of the EU's total final energy consumption (Eurostat, 2024); a number that is set to increase in coming years (International Energy Agency, 2025). Electricity demand is expected to grow by around 60% by 2030 (European Commission, 2024), due to the ongoing electrification of sectors such as heating, transport, and industry. And apart from demand growth, European grids also have to handle an increasingly diverse supply entering the system. A larger share of renewable energy needs to be integrated, with the EU estimating an increase from 400 GW of installed wind and solar generation capacity in 2022 to at least 1,000 GW in 2030 (European Commission, 2023). This installed wind and solar capacity has different features than supply coming from fossil fuels, which have long dominated the grids¹.

These quantitative and qualitative changes come with significant challenges. Grids as they exist need to be expanded and modernised to accommodate this transformation. This requires massive investments, estimated at €584 billion by 2030 by the European Commission in its Action Plan for Grids (European Commission, 2023) and at €75 to €100 billion per year to 2050 by the energy regulators (Acer, 2024) – almost double historic EU investment (Cremona, Rosslowe, 2024).

With infrastructure needs on the rise, total network tariffs - which make up 25% of the total electricity bill of EU households on average - surge too, as they reflect the grid investments. Energy regulators estimate that grid costs for consumers could nearly double by 2050. How these costs should be fairly allocated in the context of a just transition for all and amidst an ongoing cost of living crisis across Europe is a major question.

¹ Variable renewable energy sources, in particular, introduce an important change as these sources' electricity generation fluctuates with the environmental conditions that supply the energy (solar and wind), whereas other sources' generation have much less supply variability.

Consumers' behaviour can help lower overall grid costs. Flexible electricity consumption by households and industry lowers peak demand and increases use of electricity when it is most abundant (for example on sunny or windy days). This can reduce some of the additional infrastructural needs, thereby bringing down total network costs. These actions, often referred to as demand-side responses, can be incentivised by cost-reflective network tariffs.

This paper looks at how well-designed network tariffs can directly benefit consumers that participate in providing flexibility to the energy system; at how society as a whole can benefit from lowered grid investment needs; and at how to not leave behind the most vulnerable, but rather create inclusive benefits from this changing system.

State of play

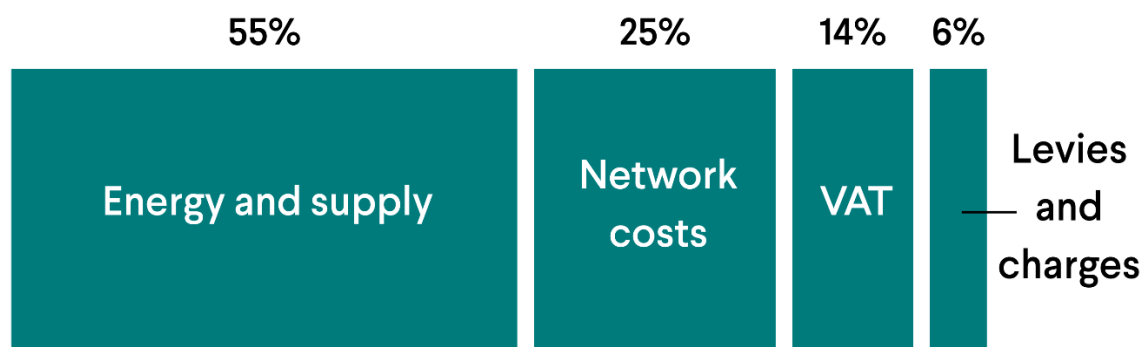
The modernisation and expansion of electricity networks, or 'grids', across Europe is paid for by a combination of public and private funding. This complex ecosystem of funding shapes both how grids are developed and how costs are passed on to consumers.

In order to pay back loans, and to procure money for day-to-day activities, grid companies, who own, operate and (typically) plan the physical electricity infrastructure, charge consumers a fee, paid as part of their electricity bills, known as a network tariff. National regulators set out how these tariffs are to be calculated in accordance with the principles set out in Article 18 of the Electricity Regulation, which states that network tariffs should be "**cost-reflective, transparent, take into account the need for network security and flexibility and reflect actual costs incurred**". In addition, the tariff regime should support "overall system efficiency", provide "price signals to consumers and producer", "locational signals at Union level and take into account the amount of network losses and congestion caused, and investment costs for infrastructure".

Since these tariffs are likely to rise in the future to fund grid expansion and modernisation, an emphasis needs to be placed on first encouraging flexible consumption to reduce the overall grid investment, and then on ensuring a fair distribution of the remaining costs to protect the most vulnerable consumers.

While it is true that electricity bills may temporarily rise, grid infrastructure will last for decades, consumers and industry will benefit from the integration of cheaper renewables, and as demand electrifies, an additional gas bill will become a thing of the past. Moreover, network tariffs are only one component of electricity bills, which means that lowering taxes, levies and charges can also help offset rising network costs (see Figure 1). Other benefits, including less pollution, reduced climate impact and improved health outcomes, are also worth considering (European Environment Agency, 2025).

Figure 1 Breakdown of average EU household electricity bill in 2023²



² Figure 1 uses calculations from page 3 of Heussaff, C. (2024). Decarbonising for competitiveness: four ways to reduce European energy prices. Policy Brief 32/2024, Bruegel. Retrieved from <https://www.bruegel.org/policy-brief/decarbonising-competitiveness-four-ways-reduce-european-energy-prices>

The building blocks of network tariff design

There is no universal grid tariff design that could simply be rolled out across the EU, as geographies have different levels of electrification, flexibility, system smartness, income levels, public acceptance and understanding. Nonetheless, a network tariff is put together from three basic building blocks: format, timing and location.

Format

This entails the unit(s) used within the tariffs. A **volumetric** format is measured in €/kWh, or euros for one kilowatt hour, where the more electricity you use, the more network tariff you pay. A format can also be **capacity-based**, measured in €/kW, where the network charge is calculated based on the peak consumption. And finally, the format can be simply a **fixed** charge a consumer must pay to be connected to the grid, measured in €/connection

Timing

This gives the temporal granularity, in which the format may differ in different periods to reflect grid status. A **flat** timing means no changes over time, whereas **time-of-use (ToU)** means set periods, such as a day-rate and a night-rate, popular across the EU, though timing can be even more granular, i.e. hourly and further. The formats in each period can either be determined in advance based on historical and forecast grid patterns, or it can depend on real-time grid status. This is known as dynamic pricing when carried out with high temporal granularity.

Location

This gives the area in which the tariff applies, at the distribution system operator **DSO (local) level** or the **country level**. The format and the timing of the network tariff could vary geographically to reflect the specific grid status in different regions.

How flexible network tariffs benefit consumers and the grid

A regulator may decide that consumers with a high potential to engage flexibly with demand, through rooftop solar, household batteries, electric vehicles and heat pumps, needs a very dynamic network tariff whose cost differs hourly depending on the state of the grid, aiming to incentivise users to shift and flatten their consumption. Consumers in areas with fewer flexibility sources, a low penetration of renewables and higher levels of energy poverty may be more suited to a tariff that has prices communicated in advance, with set blocks of time with reduced prices when the grid is known to be less congested. Here, the design of network tariffs can evolve to become more complex over time, as people learn more about how the prices work, adopt more flexible technologies, and grow confident that new network tariffs will not lead to an undesirable change in household expenses. An important consideration in any such geographical division is that even in areas with high general rates of flexibility potential, there may be users who do not hold this characteristic and vice versa. Safeguards need to be in place to ensure that these users are not disproportionately burdened.

Current EU policy framework

While regulators determine the specificities of network tariffs at the Member State level, the EU policy has an ever increasing role, stemming from the **Electricity Market Regulation and Directive**. These pieces of legislation set network tariffs as a mechanism to allow system operators to recover the costs of investments in the electricity grid and to pay for the general running of the services. The Regulation sets out that network

charges should be cost-reflective, provide incentives in the short to long term, including anticipatory investments (i.e. investment in grids anticipating new future demand and generation), support the integration of renewables, optimise the existing grid, and further objectives of the National Energy and Climate Plans (NECPs).

The EU's **Agency for the Cooperation of Energy Regulators (ACER)** regularly oversees the progress made on network tariffs across different EU countries and facilitates the sharing of practices and recommendations. In 2023, the European Commission published its **Action Plan for Grids** to address growing calls to tackle bottlenecks in the electricity system. One of the actions was for ACER to propose recommendations on network tariffs to promote smart grids. The **European Network of Transmission System Operators for Electricity (ENTSO-E)** plays a similar role in analysing the component of network tariffs responsible for transmission system investments and regularly publishes an annual overview (ENTSO-E, 2025).

As promised under the **Action Plan on Affordable Energy**, the European Commission's guidance on network tariffs published in July 2025 emphasised promoting flexibility. The Action Plan on Affordable Energy also suggested introducing a legally binding legislative proposal on network tariffs. However, it is unclear what this could entail, as setting network tariffs is the remit of independent regulators. The upcoming European Grids Package or Electrification Action Plan could include this legislative proposal.

Negotiations on a revised **Energy Taxation Directive** have been slow, following the European Commission's proposal in 2021. While this legislation does not govern network tariffs directly, it examines other components of energy bills. A lowering of taxes on electricity compared to gas, could go hand-in-hand with flexible network tariffs in supporting electrification.

What's missing?

Sufficient protection for consumers experiencing energy poverty

There is a balance to strike when designing network tariffs. It is important that consumers who choose to opt into flexible network tariffs can see a direct financial benefit, while being provided a level of security from market exposure. Those who cannot yet afford the technology required to participate flexibly in the energy system must not be hit disproportionately by rising network costs.

In the European Commission's guidance on network tariffs (European Commission, 2025), national regulators are asked to consider the use of capacity charges to reduce peak loads, time-of-use elements, location, public budget, and the treatment of different groups. However, the guidance does not mention consumer protection or energy poverty. Following this publication, the European Commission is set to launch its European Grids Package at the end of 2025. It remains to be seen whether energy poverty will be addressed in this new initiative.

Ambition and best practices

While there has been a shift at the EU level on network tariffs, many countries are behind or have not started transitioning towards flexible network tariffs. According to ACER's 2025 network tariff report, Italy, Slovakia, Romania and Bulgaria have no time-of-use tariffs, and 'inefficiency and ineffectiveness' have led Latvia to phase out its time-of-use tariffs. At the same time, almost all Member States have been slow to introduce dynamic tariffs.

Investment with EU budget

The cost a consumer pays as network tariffs is determined by how grid investments are made, where the money to invest comes from, and how the grid is operated. Greater public investment can help offset charges loaded onto vulnerable consumers, while more financing towards sources of flexibility can help lead to a better optimised, more cost-efficient grid. Historically, the EU has had a focus on partially financing cross-border infrastructure projects, such as interconnectors, and has granted funds to system operators looking to invest in both transmission and distribution within their internal grids. However, this financing comes nowhere near meeting the needs now foreseen.

Public awareness of flexibility

Disinformation on renewables remains a problem in society. Nonetheless, great messaging has been done to link the deployment of renewables to tackling climate change, with 85% of EU citizens believing we should massively invest in wind and solar (European Commission, 2024). More work must now be done to link the need for grid investments to integrating renewables in the public's mind, to better communicate how this can positively affect household energy bills, and to show how the structure of energy bills will change to better accommodate flexibility.

What can the EU do?

Roll out flexible and dynamic network tariffs

The European Commission's guidance is clear: national regulatory authorities (NRAs) should bring in new network tariff regimes to boost system flexibility, shift peak loads, and ensure cost-effectiveness. This means making it clear that consumers who engage in system-friendly flexibility will benefit financially, by gradually introducing more dynamic tariffs. It is vital that regulators communicate with users, and that changes come alongside education.

Exposure to price signals linked to the state of the electricity grid gives consumers a direct incentive to save money by aligning consumption with the grid's needs. However, market exposure comes with a risk of sudden shocks. NRAs could consider the use of a **price corridor** or **price shield** as a transitional method, where the price of a network tariff follows market signals up to a certain threshold, giving consumers security, while encouraging them to shift consumption of their heat pump and electric vehicle. Under the upcoming Citizens Energy Package, the European Commission should offer guidance to countries and share best practices.

Design fair special tariff regimes

The European Commission guidance notes that some NRAs have historically treated types of grid users differently, in order to promote affordability or competitiveness, and that this means grid costs are shifted between users. These "special tariffs regimes" have been used in some countries to ensure industry pays lower costs compared to households. The Commission argues that these special cases should not break with the cost-reflectiveness principle.

NRAs should seek to ensure the costs are distributed fairly among types of grid users, taking into consideration households on lower incomes. While having a separate regime for industry might be fitting in some cases, perhaps through state aid, conditionalities such as a commitment to enhance the flexibility of industrial processes should apply, to ensure better cost-reflectivity. Rules for data centres should ensure that the centres cover the costs for impacts on the grid and are not granted exceptions. Favourable special tariff regimes could be developed to boost energy storage, flexibility and energy sharing.

A special tariff regime for lower-income households could include the **removal of fixed costs**, fees that are paid annually regardless of electricity consumption, with the possibility of extending this regime to energy communities and households engaged in flexibility. This would support a more favourable ratio between consumer electricity and gas prices, incentivising the household to switch to a heat pump, and later provide system flexibility.

The upcoming **European Grids Package or Electrification Action Plan** should further clarify special tariff regimes and specifically outline how special tariff regimes can protect more vulnerable households and support activities such as energy sharing.

Widen access to technological conditions for flexible demand

Consumers can benefit from a more flexible and dynamic network tariff only when they have technologies that can shift demand, such as a heat pump, an electric vehicle, or smart appliances coupled with a smart meter. Unfortunately, many countries are lagging behind on smart meter deployment; in ten EU countries, fewer than 30% of households have them.

Member States should fully implement the Electricity Directive, and the EU Commission should consider infringement procedures to guarantee rapid adoption.

The upcoming Electrification Action Plan and Heating and Cooling Strategy should focus on tackling barriers and bridging financial gaps to households getting green flexible technologies such as heat pumps. These actions should be integrated with NECPs and National Building Plans.

Allocate more public financing to grids

Other than well-designed network tariffs, keeping overall network tariffs down will depend on how money is found to pay for grids. During times of high interest rates, private investors want high returns, which means system operators may raise network tariffs to cover investment in grids. Increasing EU funds, national public investments and low-interest loans backed by the European Investment Bank (EIB) can help keep costs down (Wettingfield, Zerzary, 2025).

The European Commission's proposal for the next Multiannual Financial Framework, the EU's long-term budget, includes a significant hike in resources allocated to the Connecting Europe Facility for Energy (CEF-E). This facility is responsible for providing funds toward cross-border European infrastructure, such as electricity grids, storage, hydrogen, and CO₂ pipelines. During negotiations, **EU institutions should ensure that an increased budget for CEF-E is used for electricity projects only.**

Further support is also needed for grids within Member States, both for transmission and distribution. The upcoming **European Grids Package should streamline existing funding for grids into a one-stop-shop.**

Boost flexibility to keep grid charges down for all

Greater system flexibility can shift loads, lessening the pressure to expand grids, lessening the need to invest in grids, and therefore lowering grid tariffs. **Member States should undertake their National Flexibility Needs Assessments**, and seek to fill the gap with storage- and demand-side response, and use this opportunity to roll out flexible tariff designs. As mandated by the Regulation on the Electricity Market, countries must include these targets in their NECPs, however the use of flexible tariffs should also be noted.

Under the future EU Flexibility Strategy, the European Commission should take stock of the use within the EU of more dynamic and flexible tariffs and **propose further guidance** and sharing of best practices.

Integrated planning

Only through comprehensive integrated planning can Europe ensure a smooth transition without certain consumers being unfairly burdened by unexpected costs. The modernisation of grids and electrification of

demand will mean households disconnect from the gas grid. Without integrated planning, gas decommissioning will not take place in line with electrification, and countries will be unable to plan social measures to ensure that vulnerable consumers are not left hooked up to the gas network. Better use of both more independent and EU-level planning can help **ensure a well-coordinated and rapid transition**, aligning in particular with flexibility planning for local electricity networks by DSOs.



References

- Acer (2024).** Electricity infrastructure development to support a competitive and sustainable energy system: 2024 Monitoring Report. Retrieved from https://www.acer.europa.eu/sites/default/files/documents/Publications/ACER_2024_Monitoring_Electricity_Infrastructure.pdf
- Cremona E., Rosslowe C. (2024).** Putting the mission in transmission: Grids for Europe's energy transition. Ember. Retrieved from <https://ember-energy.org/latest-insights/putting-the-mission-in-transmission-grids-for-europes-energy-transition/>
- ENTSO-E (2025).** Overview of Transmission Tariffs in Europe for 2022 and 2023. Retrieved from <https://www.entsoe.eu/news/2025/06/20/entso-e-publishes-its-annual-overview-of-transmission-tariffs-in-europe-for-2022-and-2023/>
- European Commission (2023).** Communication: Grids, the missing link - An EU Action Plan for Grids. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52023DC0757>
- European Commission (2024).** Eurobarometers on energy. Web article. Retrieved from https://energy.ec.europa.eu/data-and-analysis/eurobarometers-energy_en
- European Commission (2024).** In focus: EU investing in energy infrastructure. Web article. Retrieved from https://energy.ec.europa.eu/news/focus-eu-investing-energy-infrastructure-2024-10-15_en
- European Commission (2025).** Communication on future proof network charges for reduced energy system costs. Retrieved from https://energy.ec.europa.eu/publications/communication-future-proof-network-charges-reduced-energy-system-costs_en
- European Environment Agency (2025).** Renewables, electrification and flexibility - For a competitive EU energy system transformation by 2030. Retrieved from <https://www.eea.europa.eu/en/analysis/publications/renewables-electrification-and-flexibility-for-a-competitive-eu-energy-system>
- Eurostat (2024).** Energy statistics dataset. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_statistics_-_an_overview
- International Energy Agency (2025).** Electricity 2025. Retrieved from <https://www.iea.org/reports/electricity-2025/demand>
- Wettingfield W., Zerzary F. (2025).** Powering the future: Balancing Grid Investments and Consumer Protection in Europe's Energy Transition. Climate Action Network Europe. Retrieved from https://caneurope.org/content/uploads/2025/10/D3.1_CAN_Grid-Tariffs.docx.pdf

About the Foundations

Green European Foundation

The Green European Foundation (GEF) is a European-level political foundation whose mission is to contribute to a lively European sphere of debate and to foster greater citizen involvement in European politics. GEF strives to mainstream discussions on European policies and politics both within and beyond the Green political family. The foundation acts as a laboratory for new ideas and offers cross-border political education and a platform for cooperation and exchange at the European level.

GEF's Policy Hub tackles key European issues related to the intersecting domains of energy, climate, social, and economic affairs. Ultimately, we aim to set out ideas and proposals that can inform and incentivise policies for an equitable and systemic green transition.

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