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Making electricity cheaper: RAP's eight priority actions

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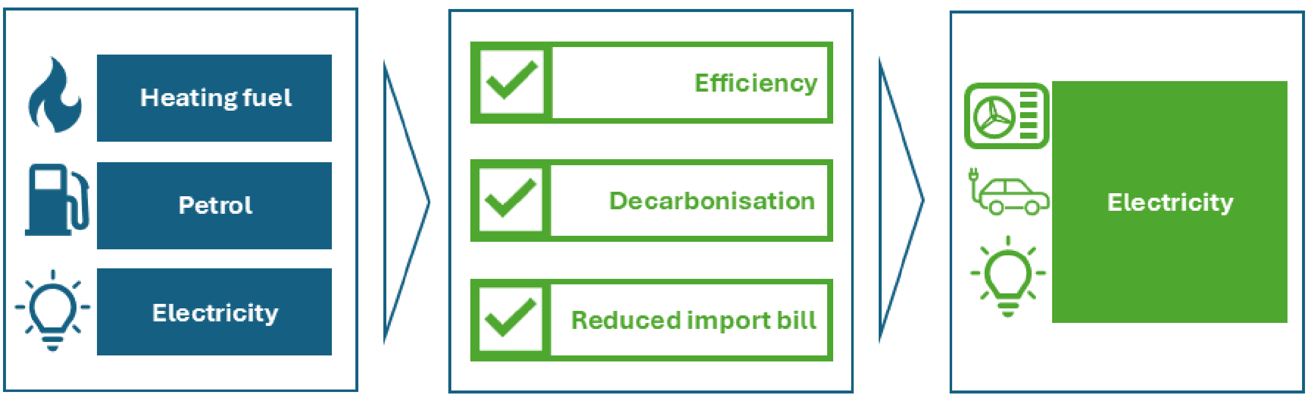
The future energy bill for European industry, businesses and households is an electricity bill. The benefits of electrification are manyfold: electricity can be home grown removing the increasing threat of reliance on fossil supply from third countries, electrically-powered end-uses are more efficient and electricity is decarbonising faster than any other energy carrier. Electrification is the best solution for the majority of end uses to pivot away from fossil reliance.

Lowering electricity prices is vital to improve competitiveness of Europe's electrified economy, increase affordability for many Europeans and unlock the benefits of electrification at the fastest possible pace.

Figure 1: The future energy bill is (primarily) an electricity bill

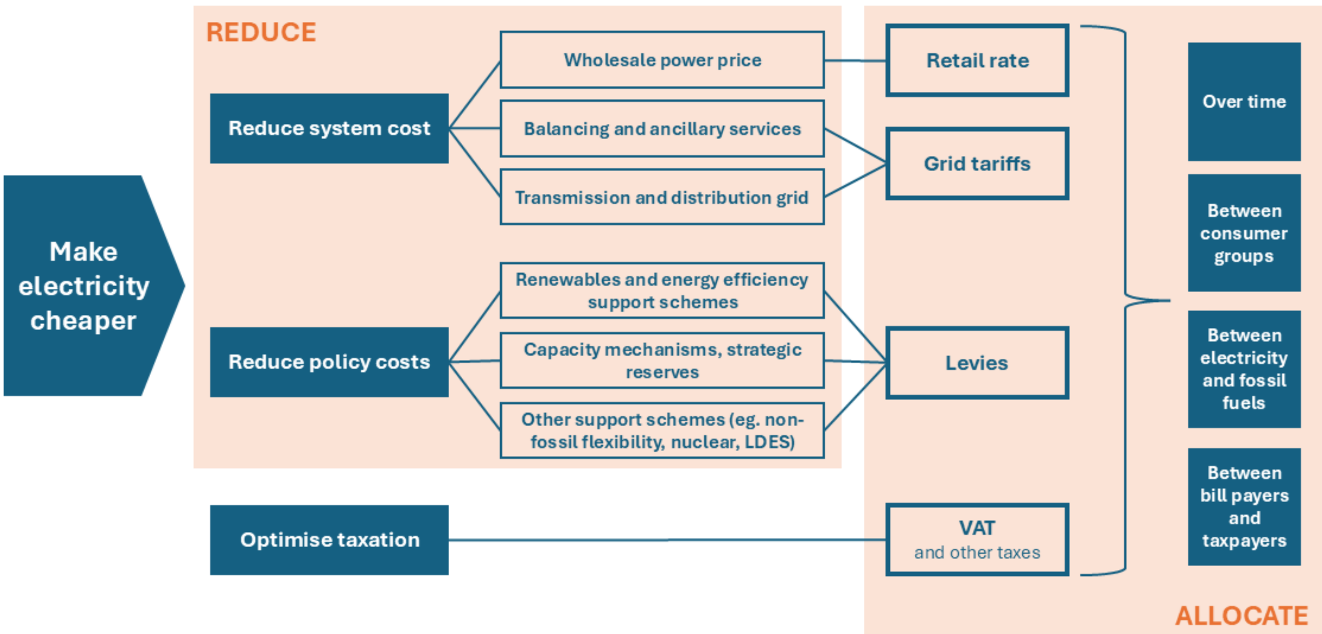


Reducing costs, designing prices

Structurally lowering the prices of electricity requires strong and effective energy system regulation and integration, a hawk-eyed focus on removing or mitigating upward cost pressures, and innovation to encourage low-cost alternatives. While renewable generation can be expected to reduce wholesale prices thanks to its very low operational costs, the costs of balancing and securing supply in a system dominated by variable renewables can be expected to increase. Plus, with more end uses electrified, European grids will need investment in key strategic areas.

How the various cost elements evolve at the system level, what costs we include in electricity bills and what signals we send through network and retail tariff design all contribute to or detract from European goals of competitiveness, affordability and decarbonisation. It is a series of regulatory and policy decisions, along with market prices, that govern the outcomes for each element that add up to the price paid by the various end users.

Figure 2: Illustration of the components of an energy bill and groups of strategies to reduce



The primary way to lower prices is to **reduce the overall costs of the electricity system**. The wholesale price of electricity is set by the marginal generation unit, hence increasing the hours when cheaper renewables generation set the wholesale price is essential. Adding more renewables, flexibility and storage to match demand and supply and make best use of existing resources, can bring prices down. Developing just the right amount of grid capacity at the right location mitigates the increase of grid costs.

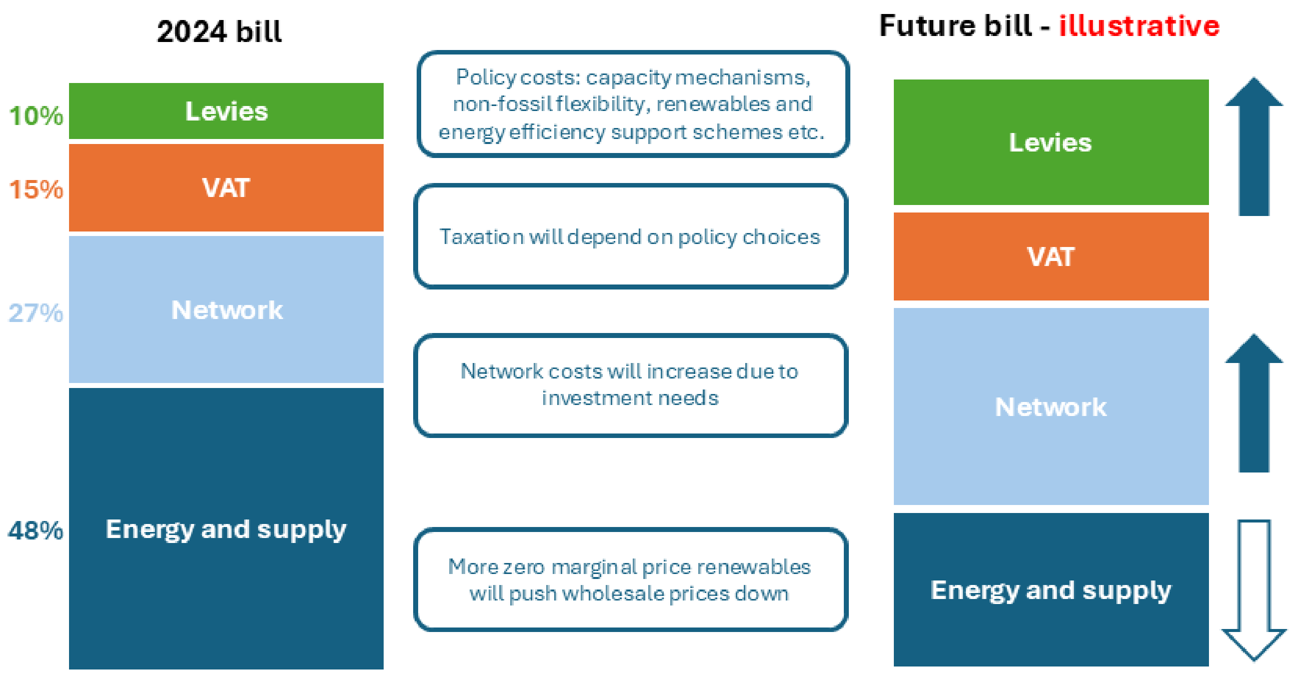
In parallel, and with an important feedback loop to system efficiency, it is important to efficiently **allocate costs between different groups.** Decisions on the distribution of costs are driven by different objectives, for example, reflecting the full costs of generating and supplying electricity in prices, reducing system costs, encouraging efficiency and flexibility, supporting or protecting priority groups, and achieving other macroeconomic outcomes. Unpicking this distribution, we can consider three categories of decision making:

- Which costs should be paid by bill payers (electricity, gas or other fuels) and which costs by taxpayers/
- Which groups of end users should pay for which costs, and which are exempted.
- How should tariff design distribute costs between users of different types – for example high users, high peak users, users of electricity for different end uses or users and producers - or to create incentive structures.

In addition, we can **distribute costs over time**. Knowledge of the balance of cost components within the overall price and estimating how this will change over time and as the energy system changes equips us with an additional tool to manage prices in line with goals. Decisions can be made to spread costs over more present and future users, delay cost recovery to stabilise prices or provide price relief at key moments – for example to kick start end-use electrification – or in line with fluctuations in other cost elements.

Tariff design is not a blunt cost recovery tool, it is a system efficiency tool that is used to incentivise efficiencies and flexibilities of use and location. Tariff design has a social or economic policy impact as it defines which users or use bear more or less of the costs.

Figure 3: Expected changes in electricity bill components



Notes: Stylised figure based on average bill proportions across 27 EU Member State in 2024. Actual shares of components will vary. Based on bill composition in Eurostat (band 2,500-5,00 kWh)

Source: Adapted from Bruegel, 2024 https://www.bruegel.org/policy-brief/decarbonising-competitiveness-four-ways-reduce-european-energy-prices

Priority short-, medium- and long-term solutions

RAP has identified eight priority levers that should be implemented immediately to make electricity cheaper. Each lever impacts in a different timeframe: short, medium and long term.

Each measure aims to reduce electricity prices for all. In addition, and in complement, social tariffs reduce prices for priority households and energy efficiency improvements to buildings, equipment and processes reduce electricity use, the other important lever to reduce the bill.

Early action on electricity prices can kick start electrification. Policymakers and regulators can act on multiple fronts to drive down the cost of the electricity system and allocate costs in an efficient and equitable way.

Description of policies	Impact on price
Short term impacts (1 year)	
1. Reducing taxes added to electricity #allocate	Reducing VAT or excise duty is an immediate way to reduce electricity prices for all, or selected, end uses. Reducing taxation on electricity and increasing it on fossil fuels can balance revenue loss and provide a greater boost to electrification.
2. Policy and network cost recovery that supports efficiency and flexibility #reduce #allocate	Efficient recovery of policy costs can incentivise efficiency and flexibility lowering system cost for all. Absorbing some legacy costs, for renewable support for example, into state budgets is also appropriate to support electrification. Similarly, the investments needed for strategic grid build out could be supported by EU funds to avoid automatic pass back onto bills.
Medium term impacts (5 years)	
3. Ramping up demand-side flexibility at scale #reduce	Moving demand away from peak times reduces the times at which expensive fossil fuels are setting the electricity price. Mobilising demand to align with supply also makes best use of renewables and grid resources, reducing system costs for all. Individuals can also access lower prices directly by moving demand to cheaper times.
4. Using grids more efficiently #reduce	Better use of existing grids reduces the volume and speed of new grid investment and thus associated cost.
5. Double-side contracts for difference (CfD) that reflect system value #reduce	Double-sided CfDs make renewables build out cheaper by lowering the cost of capital and return high revenues back to customers. Innovative double-sided CfDs also reward renewables that generate at the most valuable time for the system.
6. Efficient design of capacity mechanisms #reduce	Reducing the need for capacity mechanisms and supporting only the minimum necessary resources limits the policy cost. Recovering costs at peak hours can add to price signals to move demand away from expensive and fossil-reliant peak.
Long term impacts (10 years)	
7. Locational pricing #reduce	Location-specific prices create more efficient local markets. This directs the location of new assets (e.g., generation, batteries) to the most valuable places and optimises both generation and demand to reduce system cost.
8. Efficient planning and build out of transmission grids #reduce	A more robust transmission grid enables renewables generation sourced from a larger geography – wherever the sun is shining or wind is blowing – to substitute gas in setting the wholesale price.

Short term (one year)

1 Reducing taxes added to electricity

Electricity is often taxed well beyond the minimum rate allowed by European legislation (both VAT and excise duty). Electricity is also often taxed more heavily than other fuels, notably natural gas. To send clearer signals for electrification, governments can take one of or a combination of approaches:

- *Reduce* taxation of electricity once adequate fiscal space is available and politically feasible
- *Exempt* selected electricity users or type of electricity end use (e.g., for heating) from some energy taxes by moving these costs into general taxation, or
- *Rebalance* taxation revenues between electricity and other energy carriers, thus boosting the relative attractiveness of electricity compared to fossil fuels.

These changes are quick to implement, will reduce prices in the short term, and can be actioned while longer-term measures to create a least-cost, decarbonised electricity system are given time to take effect.

RAP resources: Making electricity cheaper: Redistributing policy costs for affordable household heat electrification (2025), Making electricity cheaper: Modernising taxes and levies to incentivise electrification of industrial heat (2025)

2 Policy and network cost recovery that supports efficiency and flexibility

Policy costs, such as capacity mechanisms and some renewable and energy efficiency support schemes, will likely increase in the future due to the need to further develop renewable energy, non-fossil flexibility or long duration energy storage. Cost recovery of these mechanisms needs to be efficiently designed to provide incentives for electrification, safeguard demand-side flexibility and prevent overburdening of priority groups.

For example, *reducing/absorbing*, *exempting* or *rebalancing* the costs of legacy renewable support schemes like feed in tariffs into the national budget or between energy carriers can reduce electricity prices. Similarly, recovering the cost of capacity mechanisms only during peak hours provides incentives to reduce hours of reliance on high price fossil fuel generation. Similarly, big investment in grids, needed to integrate more renewables and connect new electrified loads, will bring sizeable tariff impact. This can be mitigated by mobilising (EU) public funds rather than passing all costs immediately on to users through prices and spread over time by changing the pace/rules of depreciation.

RAP resources: Making electricity cheaper: Redistributing policy costs for affordable household heat electrification (2025), Cost recovery in the electricity sector – principles and practices (2026)

Medium term (three to five years)

3 Ramping up demand-side flexibility at scale

Demand-side flexibility aligns demand with supply from renewables to make most efficient use of generation and grid resources. Moving flexible demand away from peak times is also one of the quickest ways to reduce the number of hours that expensive fossil fuels set the whole electricity price. Moving demand to hours of abundant renewables also reduces wasted electricity.

Mobilising significant amounts and types of flexible demand reduces investment in generation, storage and grid capacity, benefitting all electricity users by lowering system costs. In addition, individual electricity users can benefit directly from offering their flexibility to access cheaper electricity at different times via a dynamic tariff or via aggregation to access an overall lower electricity bill. Mobilising demand side flexibility requires energy market price signals to reflect the value of flexibility, market rules that enable demand-side resources to compete, roll out and activation of flexible assets and retail market offerings, and automation that make offering the flexibility of demand rewarding, easy and safe.

RAP resources: Joy of Flex (2022); Flex-ability for All (2024); Imagine all the people (2025)

4 Using grids more efficiently

Grid cost is expected to increase as the integration of renewables and electrification requires a larger, more interconnected electricity network. Taming grid cost requires actions to optimise access and use of current grid capacities. This includes:

- Reforming the fundamentals of the incumbent regulatory regime. Fostering flexible connection agreements and colocation of compatible assets behind a single connection point can tackle grid scarcity at speed and reduce investments. The current first-come, first-served approach to new grid connections needs reform in favour of prioritisation of connections with social or strategic merit. Queues also need to be cleaned up by removing unviable projects that delay allocation to ready-to-connect users.

- Network tariff reform to provide incentives to connect and use grids in places and times where there is available capacity can also make more of what we have without extra investment. This assumes transparency of grid availability and use, which is still piecemeal at best.

- Independent system operation – preferably at European level – would also improve the efficiency of transmission grid use. The low share of interconnector capacities offered by transmission system operators for trade results in a huge welfare loss for European consumers.

- Traditional demand-side policy can also contribute. Improving the thermal properties of buildings in areas with the tightest grid constraints would also increase their ability to provide flexibility services – their flexibility capital.

RAP resources: Transparent Grids for All (2024); Right here! Right now! (2024); RIP first come, first served (2024)

5 Contracts for difference for renewables that reflect system value

Increasing the share of renewables in electricity generation is key to reducing the dominance of fossil fuels in setting the wholesale price. It is therefore crucial to build renewables generation at the lowest possible cost. Double-sided contracts for difference can reduce the costs of renewable generation to electricity users in three ways. First, the contract provides certainty of revenue to renewables investors by topping up the wholesale price when it drops below the agreed price. This certainty reduces the cost of capital. As a capital heavy but low operating cost generation, cost of capital is the critical factor for cheaper renewables. Second, the 'double-sided' nature of the contract allows the public entity to claw back revenues from the renewables generator when wholesale prices rise above the agreed price. The public entity then redistributes this revenue back to customers, possibly through lower bills. Third, a further innovation in double-side contracts for difference rewards generation at times and locations that are most valuable to the system – linking remuneration with value. This innovation further reduces the costs of renewables by supporting the most efficient interactions with wholesale markets and underpinning efficient dispatch, maintenance and investment decisions. Not just more renewables but more of the most valuable renewables for the system.

Bringing existing 'legacy' renewable generation under double sided contracts for difference is also an alternative to the various interventions to skim windfall profits introduced in the energy crisis.

RAP resources: The search for two-sided CfD design efficiency (2023); Balancing act (2023); Better, faster, stronger: A look into further electricity market reforms (2023)

6 Smart design of capacity mechanisms

In an electricity system dominated by variable renewables, 'backup' resources may be needed when system operators face concerns about being able to meet demand for electricity. EU countries are allowed to support such generation capacity and six countries opt to use capacity mechanisms. Capacity mechanisms provide revenue to new or existing generation, storage and demand side response (in addition to earnings for electricity sold in the market) to incentivise them to be available when needed. Minimising the need and use of capacity mechanisms and controlling the costs is key to keep prices down. Key design features to make capacity mechanisms efficient and competitive include:

- Improved guarantees that resources get built and are available when needed.
- Improved calculation of capacity needed to avoid over procurement, considering all resources (interconnectors, flexibility) and demand projections which account for energy efficiency improvements.
- Opening the mechanism to support all resources (not only generation), including domestic or foreign to procure the cheapest solution.
- A shorter commitment period of one to three years to avoid locking in fossil fuel support.

RAP resource: Capacity markets — six mitigations for six drawbacks (2023)

Long term (ten years)

7 Locational pricing

Locational pricing means that instead of using the same wholesale price in each bidding zone - most often meaning each in each country - we define a price that reflects the cost of supplying an extra unit of energy in a location, given grid constraints. The aim is to create more efficient local markets. Such pricing would inform generators and consumers about the 'real price' at the location, providing more specific signals for response than that provided by the averaged price. Locational prices would thereby guide investments in generation and storage where it is most beneficial for the system and for the investor and would also guide location of new load that is flexible in siting. Persistent price differences across locations would show where more grid capacity is needed. These signals would drive more efficient investments and thereby reduce the overall volume of investment and lower system cost.

Areas with abundant renewables coupled by flexible resources and demand would enjoy the low price that can be achieved in a future European net zero electricity systems.

RAP resource: Mechanics of implementing nodal pricing in European wholesale markets (2024)

8 Efficient planning and build out of transmission grids

Transmission grids move electricity over large distances. More robust transmission grids are key to sharing the value of wind and solar generation across Europe making the most of the diverse resources within the region, from hydro in the Nordics to solar in the Iberian peninsula to wind in the North Sea. Transporting generation from areas of abundance reduces waste and enables renewables generation sourced from a larger geography to substitute gas in setting the wholesale prices in more places. Interconnectors at the national/bidding zone borders reduce wholesale price differences between neighbours and indicate where additional capacity is needed. Coupled with a European Independent System Operator taking control of the planning and operation of the European transmission grid, strategic investment in transmission and interconnectors would improve efficiency and hence lower overall system cost in the long run. Although strategic investment in interconnection and transmission is necessary and will add to electricity prices, these investments are vital to deliver the least cost net zero system.

RAP resource: Revitalising regulation to guide anticipatory investment (2025)

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