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# Making electricity grids cheaper: RAP's 10 priority actions

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The future energy bill for European industry, businesses and households is an electricity bill. Lowering electricity prices is vital to improve the competitiveness of Europe's electrified economy, increase affordability for many Europeans, and unlock the benefits of electrification as fast as possible.[1] The network tariff – which goes towards the cost of building and operating the grid – makes up one-third of an average household electricity bill, and this is likely to increase if the tariff continues to fully cover costs: EUR 1.2 trillion of investment is needed by 2040 to serve the increasing demand for clean electricity in Europe.[2] Containing the level of the network tariff is therefore key to making electricity cheaper and unlocking electrification.[3]

This brief focuses on the electricity bill as the energy bill of the future. Specifically, it looks at how to reduce its grid element, which is an increasingly important element in the bill – and therefore in the affordability challenge.

[1] Sunderland, L., Pató, Z., Morawiecka, M. & Claeys, B. (2025). *Making electricity cheaper: RAP's eight priority actions.* Regulatory Assistance Project. https://www.raponline.org/knowledge-center/making-electricity-cheaper-8-priority-actions/

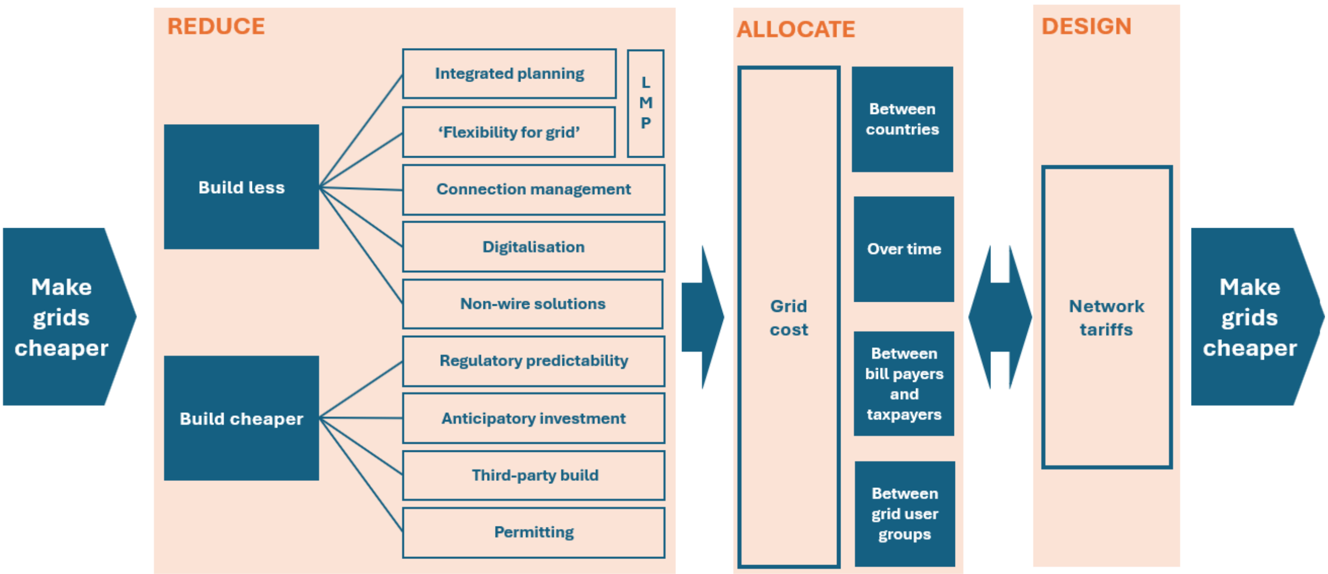
[2] European Commission. (2025). *European grids package COM(2025) 1005 final.* https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52025DC1005

[3] The author would like to acknowledge and express her appreciation to the following people who provided their review: Pablo Hevia Koch; Rena Kuwahata (Agora Energiewende); Monika Morawiecka, Andreas Jahn and Louise Sunderland (Regulatory Assistance Project). She would also like to thank Bram Claeys for his input to the preceding discussions.

# Reduce–allocate–design

Making grids cheaper for consumers requires a looped approach (Figure 1). First, the overall cost of grids must be reduced via policies to make better use of existing grids to delay or reduce build, and for any necessary new capacities to be built more economically. Second, those costs must be allocated. Third, tariffs must be designed that reflect the allocation and that incentivise grid users to consider grid availability, hence reducing the need for new grids.

**Figure 1. The grid cost loop: reduce–allocate–design (to reduce)**




Source: RAP

*LMP = Locational marginal pricing*

# 1. Reduce grid costs

The primary ways to lower grid costs are to develop just the right amount of grid capacity at the right location in a timely fashion ('**Build less**') and to build it as cheaply as possible ('**Build cheaper**'). Without compromising the benefits of more grids, we must implement policies to build less and cheaper to mitigate grid costs in bills and unlock cost-effective end-use electrification.

Grid investments pay off. Addressing transmission grid needs by allowing more efficient use of the pan-European generation mix could save EUR 9 billion per year through to 2040.[4] Increased electrification coupled with improved use of grids is a win-win solution, as the cost of grids can be spread across more kilowatt-hours of demand.

[4] ENTSO-E. (2026). *What are the concrete benefits for Europe of investing in its cross-border transmission grid and storage infrastructure?* https://tyndp.entsoe.eu/explore/what-are-the-concrete-benefits-for-europe-of-investing-in-its-cross-border-transmission-grid-and-storage-infrastructure

We have identified 10 key policy options that can make grids cheaper compared to the business-as-usual acceleration of grid buildout (Table 1). They reduce the grid cost for all users either 1) by reducing the volume of needed new grid capacity, or 2) by making those investments cheaper.

Improving the use of existing grids with better planning and market signals, exploiting flexibility of generation, storage and demand, and digitalising grid operation all help to reduce the need for new capacity. While reducing peak demand through flexibility is important, as grids are sized to serve peak periods, so is increasing consumption when there is ample grid capacity in order for more resources in the queue to be connected to the grid. **We need to reduce peaks and improve utilisation to speed up the integration of assets**.

As grids are capital-intensive investments, we can reduce the cost of buildout by **lowering the capital cost and speeding up the permitting process**.

Most options are applicable for both transmission and distribution grids, but some are more important for one or the other. Note also that some of these options are preconditions for others: digitalisation, for example, is a requirement for better utilisation.

**Table 1. Ten policy options to make grids cheaper**

| Policy option | Pathways to reduce grid cost |
|---|---|
| **1. Integrated planning**<br>#build less | Coordinated European transmission grid planning based on congestion maps covering the entire grid (cross-border and internal) defines priority projects to manage congestion. Integrated planning across the various energy networks, both at transmission and distribution level, aligns networks with energy scenarios. |
| **2. Flexibility for grids**<br>#build less | Making sure that flexible assets and demand operate in line with available grid capacity improves the utilisation of existing grids. Local grid constraints do not necessarily coincide with constrained market conditions and high prices. |
| **3. Locational pricing**<br>#build less | Location-specific prices direct the location of new assets (e.g., generation, batteries) to the most valuable places and optimise both generation and demand to reduce system cost. In addition, local prices dispatch resources based on grid realities. |
| **4. Connection management**<br>#build less | Digital queue management that prioritises projects based on maturity, social value and 'grid friendliness' improves access and utilisation of connection capacities. Co-location or complementary assets and flexible connection agreements speed up access to the grid. Transparency on 'real' (not opportunistic) demand for connection and connection charges is key for realistic grid planning and for defining investment priorities. |
| **5. Digitalisation**<br>#build less | Digitalisation supports real-time grid monitoring and AI-assisted analysis. This more granular insight allows more realistic capacity assessments, improving the utilisation of grids and reducing the need for new capacity. |
| **6. Non-wire solutions**<br>#build less | Revenue incentives for grid companies to make better use of existing grids and non-wire solutions save costs, particularly when compared to investing into new grids. |
| **7. Regulatory predictability**<br>#build cheaper | Credible political ambition – reflected in network planning, stable grid access and use regulation, and evidence-based reviews – can lower risk for investors wanting to connect or already using the grid. |

| | |
|---|---|
| **8. Anticipatory investment** #build cheaper | Accommodating grid investment that meets anticipated needs based on credible assessments lowers the unit cost of investment. Grid plans need to align with and be revised based on realised and robust forecasts for electrification. |
| **9. Third-party build** #build cheaper | Opening up the monopoly of distribution system operators (DSOs) and transmission system operators (TSOs) in building grids can reduce costs through competition and reduce lead-times by broadening human and financial resources. Quicker deployment brings forward the benefits of electrification. |
| **10. Permitting** #build cheaper | Having streamlined, single-point-of-contact permitting per jurisdiction with sanctionable deadlines reduces lead times and uncertainty, resulting in lower costs for investors. |

Source: RAP

# 2. Allocate grid costs

After reducing the overall cost, policymakers are faced with the question of how to allocate the remaining costs among grid users and (potentially) taxpayers. **The allocation of grid costs is usually driven by system efficiency and broader social and economic considerations**. Efficiency in the broad sense means that those who cause the cost cover it, therefore they have an incentive to reduce the costs they create. Social and economic considerations often include, for example, the protection of vulnerable consumers or improving the competitiveness of priority industries.

The main decisions are:

- How to allocate the cost of interconnectors among countries benefitting?

Today, grids connecting neighbouring countries are financed by those two countries and cost allocation is often shared equally or determined by the location of the elements built. The benefits of a new interconnector capacity, however, are distributed differently and are not limited to the two hosting countries. Although estimating the future benefits of new interconnector capacity in the zonal system is not an easy task, there is considerable room for improvement in aligning costs to benefits. Countries that enjoy more benefits – through lower prices, or better system reliability from increased trade – would pay more. Locational marginal pricing in Europe would steer transmission grid buildout (including current interconnectors) more organically.

- How do we distribute grid investment costs over time?

Grid investments are recovered in the network tariff over the lifetime of the asset, which can be as long as 40 to 50 years. As grid investments will ramp up from previous levels that will put more pressure on bills. However, assuming that energy prices will gradually reduce with more renewables and flexibility in the system, higher future bills can be avoided by spreading depreciation over a longer period, or through the creation of a state loan or fund to enable a later start to grid cost recovery. This would keep electrification going, although it would also increase the financing cost of grid investment.

- Which share of the costs should be paid by grid users and which by taxpayers?

Price pressure can be relieved by allocating some of the residual cost of grids to the state budget (residual costs are those costs that cannot be assigned to the actors who caused them, as is the case for grids built in the past). Moving some of these costs from residential bills to the state budget would reallocate a larger cost to wealthier residential consumers where national taxation is progressive.

- How do we allocate costs and spread incentives?

In the past, grid tariffs have been paid exclusively by those consumers who are the final beneficiaries of the energy service delivered by the grid. With enough grid capacity and dispatchable large power plants, tariffs mainly served to recover the cost of grid operation. Today, with thousands of renewable generators, storage units and flexible loads, we need to provide signals to all grid-connected assets about grid availability to reduce the need for new grids and to share grid investment on a broader basis. The second main role of network tariffs (i.e., incentivising user decisions to be 'grid-friendly') becomes essential in the current bidding zone system.

## 3. Design tariffs

Tariff design allocates costs among users, but **tariffs are not just a cost-recovery tool, they can also provide incentives to make the best use of grids**. Defining which users or uses bear which share of the costs has both social and economic impacts. Tariffs are also a fundamental tool to mobilise flexibility in grid use, primarily by aligning price with grid availability through time-of-use tariffs. In the existing large bidding zone system location-specific tariffs are key to reducing the volume of new grids, and thus make grids cheaper.

# RAP's 10 priority actions

## Policies with short-, medium- and long-term impacts

In this section we revisit our 10 policies on how to reduce cost and discuss them in more depth, as well as suggesting further reading. Implementation time needed for these policies varies,[5] and some will reduce bills quicker than others (Figure 2).

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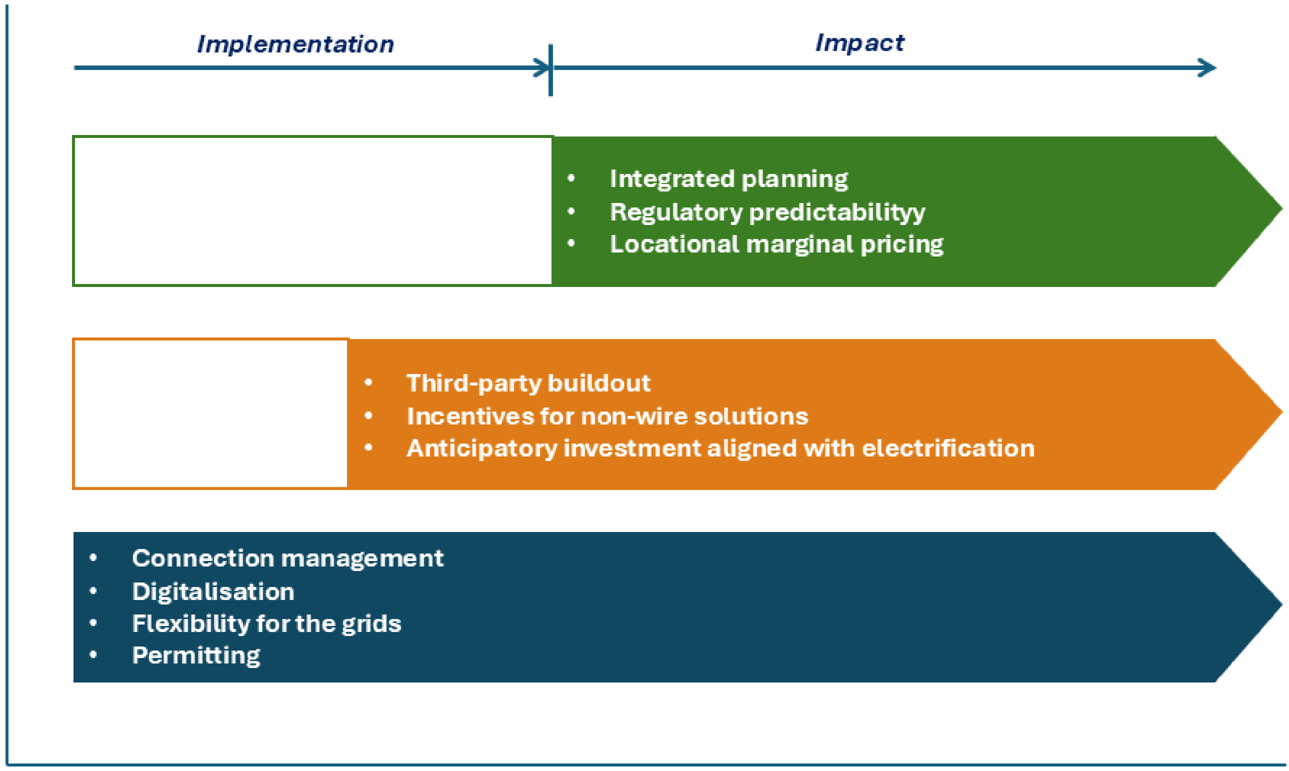
[5] The allocation of cost and the design of network tariffs is not discussed in detail: the former is less of a regulatory question and more of a political choice, while the latter is best suited for discussion in a separate paper.

**Figure 2. Implementation and impact timelines**




Source: RAP

# Short-term impact policies

## 1. Connection management

Reforming the fundamentals of the incumbent regulatory regime means moving away from today's first-come, first-served approach to prioritise projects that are mature, have high social value, and will have low 'investment impact' on the grid. The latter includes a willingness to accept flexible connection agreements and to co-locate compatible assets behind a single connection point to improve grid use. Priority rules need to be defined by the national regulator and applied in a non-discriminatory manner. Queues can be cleaned up by removing unviable projects that are delaying allocations to ready-to-connect users. Grid companies must provide granular and frequently updated information on hosting capacities, queuing resources and opportunities for flexible connections. These actions can quickly reduce the investment risk for new applicants, and hence the cost of transformation.

**RAP resources:** Transparent Grids for All (2024); Right here! Right now! (2024); RIP first come, first served (2024); Flex to connect (2026)

## 2. Digitalisation

Real-time grid monitoring enables grid companies to increase available capacity without compromising reliability. Grid monitoring installed at the distribution level facilitates the efficient operation of millions of renewable generators, storage assets and consumers – this is already widely used for transmission grids. Data collected from grid assets such as transformers, inverters, smart meters and dedicated measurement devices enables grid companies – with the help of AI – to make the most out of their grids. Digitalisation is fundamental for ramping up the operational capacity of DSOs to manage applications and integrate non-wire solutions.

**RAP resource:** RIP first come, first served (2024)

## 3. Flexibility for grids

To build less additional grid capacity we need to make sure we incentivise flexibility across the whole energy system – from supply, demand and storage. Two-sided contracts-for-difference for renewables need to be designed to decouple payment from plant output, so operators have an incentive to align generation as far as possible with market conditions. Demand-side flexibility is not only key for lowering wholesale energy prices (by reducing the number of hours during which expensive fossil fuels set prices), but also for managing grid congestion. Making sure that flexible assets operate in line with available grid capacity improves the utilisation of existing grids and reduces the need for new grid investment to cover increasing peak use. Local grid peaks, however, do not necessarily coincide with high demand/low supply markets and high electricity prices, so aligning grid use with availability requires grid-specific signals such as grid tariffs or some form of pre-agreed limitation of grid use (direct asset control or flexible connection agreements). Storage is a vital tool to manage grid congestion; however, if it responds solely to the national power price it can create integration problems for balancing and redispatch.

Mobilising flexible demand for grids reduces the need for investment and can benefit individual electricity users directly when they offer their flexibility for a lower average network cost in their bill. However, the interplay between dynamic energy and the network tariff in the bill requires careful consideration, as their composite effect can even neutralise demand flexibility.

Tariff reforms have a direct financial impact on households and businesses, so both distributional and efficiency impacts need to be carefully considered – including through stakeholder consultations.

**RAP resources:** Joy of Flex (2022); The search for two-sided CfD design efficiency – a Shakespearean history (2023); Flex-ability for All (2024); Imagine all the people (2025); Batteries: Blessing or curse? [LinkedIn Post] (2026)

## 4. Permitting

Deploying new grids takes between three and 10 years, and permitting makes up a considerable share of this lead time. Long lead times not only delay electrification and the scaling-up of renewables but also create uncertainty and therefore additional cost for projects wanting to connect. Coordinating grid development with investments in generation and demand is challenging (the latter is much speedier and is led by market actors), but this situation can be improved by reforming current permitting regimes. Permitting today is characterised by the involvement of multiple agencies, long deadlines that are not met, paper-based processes, and an inadequate level of involvement of local communities which contributes to local challenges. Creating streamlined, digitalised, single-point-of-contact permitting with sanctionable deadlines is not only a nice-to-have but a fundamental procedural condition for grid modernisation – as well as being a way to reduce the cost of financing new grids.

# Medium-term impact policies

## 5. Third-party buildout

Opening up TSO and DSO monopolies over grid development can reduce the cost and lead-time of grid projects. The value chain consists of planning and permitting, design and construction, and ownership and operations. In Europe, all these stages are executed by TSOs. Introducing competition to design and construction – which is the most costly part of the asset value chain – can reduce costs directly and indirectly. For example, incentives to reduce construction time were used in the development of transmission lines to new renewables sites across Texas (Competitive Renewable Energy Zones – CREZ), and in linking offshore wind to the grid in the UK under the Offshore Transmission Owner (OFTO) regime. Quicker buildout and less uncertainty over completion are additional benefits, speeding up the integration of renewables and lowering the risk for users who want to connect. An independent system operator and planner (such as the National Energy System Operator in Great Britain) enables separable transmission projects to be opened up for competition – in particular, those linking more remote renewables zones onshore and offshore – within the framework of a coherent grid plan.

**RAP resources:** Accelerating Transmission Network Development (Power Sector Blueprint, 2022); Better oversight, better foresight: Mandating Europe's energy regulators to think long-term to unlock clean investment (2025)

## 6. Incentives for non-wire solutions

Non-wire solutions are operational and management actions, often based on grid digitalisation, that can help solve congestion instead of – or as well as – building more grid capacity. Data collected from transmission grids, for example, enables operators to define capacity dynamically, based on weather conditions instead of static assumptions. Dynamic line rating is especially useful when connecting large wind farms, as wind cools cables – so they can carry more power flow. Non-wire solutions are cheaper and quicker to implement, but regulators have limited evidence on the extent to which traditional grid investment can be substituted. Grid companies can best be brought on board if their financial incentives are designed to favour implementation of the cheapest reliable solutions and focus on grid services that are valued by grid users. Eliminating CAPEX bias[6] and setting performance

[6] CAPEX bias arises when grid operators are incentivised to prefer capital-intensive investments over potentially more efficient OPEX-based solutions. This happens because CAPEX often provides long-term, predictable returns, whereas OPEX expenditures are treated as immediate costs and generate lower financial benefits.

indicators is a vital regulatory task. Separating grid ownership and operation is a governance solution which can help achieve this. Putting in place an independent system operator and planner model is a structural solution that remedies the problem at the root, ensuring grid build-out is in line with public interests.

**RAP resources:** Aligning business models with public interest: Rethinking revenue regulation for network companies (2026); Sweden: Pioneer in incentivising better grid use (2026); Italy: Step-by-step to modern revenue regulation (2026)

### 7. Anticipatory investment aligned with electrification

In the era of system-wide electrification, grids need to be planned for anticipated – not only definite – demand, both to reduce the grid deployment lag and to lower the unit cost of investment by scaling up investment beyond immediate confirmed use. At the same time regulators need to make sure that they only underwrite investments that have a minimum level of certainty. Dealing with uncertainty entails assessment based on prioritising 'least regret' investments across various electrification scenarios. Anticipatory investment is not a new investment paradigm; it refers to more robust electrification forecasting and review, and a more explicit risk allocation between grid developers and consumers. In countries with very fragmented distribution grid ownership, regional and national-level planning will be needed to improve the distribution system.

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

## Long-term impact policies

### 8. Regulatory predictability

Stable energy regulation reduces risk for investors, and hence the cost of system transition. Unfortunately, congestion and limited grid access have become the norm. Investors wanting to connect to the grid need to accept these realities, but they also need to be offered credible and stable regulation to move forward with their projects. They need to not only know about current capacities and access conditions, but also be aware of credible future plans with timelines and connection costs. Network development plans – reflecting plans for the energy system – need to be more granular, publicly accessible and frequently assessed to become the first point of reference for all stakeholders. Regulation backed by credible political ambitions coupled with evidence-based reviews and amendments are essential to reduce financing risk.

**RAP resources:** Transparent Grids for All (2024); Revitalising regulation to guide anticipatory investment (2025)

### 9. Integrated planning

Power grid planning needs to be approached across borders, integrating the various energy networks and electrification policies. Cross-border integration can reap the benefits of larger geographies by connecting greater numbers of more diverse generators, storage units and consumers. Prioritising transmission grid planning and build at European level based on congestion maps (regardless of whether demand is cross-border or internal), and maximising the use of this backbone grid, would enable a more significant reduction of energy prices in Europe than coordinated but essentially bottom-up planning and buildout based on national priorities. New interconnector capacities change prices, creating winners and losers on the two sides (asymmetrically for consumers and generators), and benefits are spread across many countries. This is essentially a governance problem where national TSOs decide on their network development, but their building or not building interconnectors has an impact on prices. The low share of interconnector capacities offered for trade by TSOs results in a huge welfare loss for European consumers.

Power grids also need to be integrated *across the various energy networks* to make sure that energy is delivered in the right form (hydrogen, gas, heat or electricity) without risking the construction of networks that will become stranded (e.g., hydrogen networks at the transmission level and gas grids at the distribution level).

Thirdly, power grids need to be integrated with heat, transport and industrial electrification policies and scenarios, especially at the distribution level.

Long-sighted, integrated and realistic plans allow for better handling of supply chains, which reduces costs.

**RAP resources:** Planning for success: How integrated energy planning can help the electrification of Europe (2026); Better oversight, better foresight: Mandating Europe's energy regulators to think long-term to unlock clean investment (2025)

## 10. Locational pricing

Locational pricing means that instead of using the same wholesale price in a large bidding zone – most often one per country – bidding zones are defined by transmission grid nodes, where each node has a price that reflects the cost of supplying or consuming an extra unit of energy at a given location and time. Unconstrained nodes form zones that can change as supply and demand change over time. The aim is to create more efficient local markets. Locational prices would not only guide operations, but also investment in generation and new load, to locations where it can be integrated most efficiently. Under locational marginal pricing (LMP), storage investments will be most profitable where they not only balance supply and demand but also help grid congestion, thereby lowering the need for new grid investments. Persistent price differences across locations show where more grid capacity is needed. These signals would drive more efficient investments and dispatch and enable less curtailment of renewables, reducing the overall volume of investment and lowering system cost. Introducing LMP is the best solution to steer power-grid planning (but not integration across vectors) and to mobilise 'flexibility for the grid' (Figure 1). Improving the representation of the grid in the market by defining smaller zones on the basis of structural congestion is the minimum reform needed.

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

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