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27 Plans for 2027:
Turning the Electrification Action Plan into National Action

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Key Takeaways

- The proposed Electrification Action Plan makes electrification strategic but a significant share of the levers for change remains in the hands of national governments.
- Only France and Sweden, which share a similar electricity mix, have adopted their own electrification plan.
- All 27 Member States should adopt national electrification action plans by 2027.
- Boosting electrification requires:
  1) creating visibility;
  2) making electrification the most attractive investment decision;
  3) facilitating grid connections.

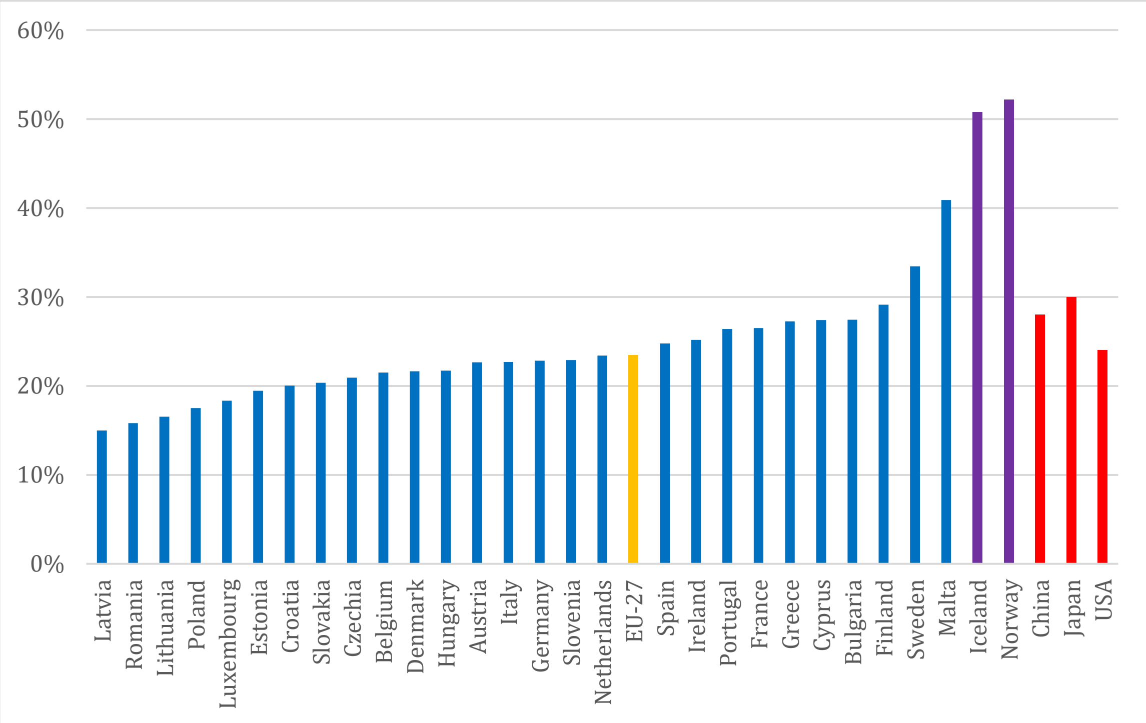
Introduction

On July 17, 2026, the European Commission (EC) published the Electrification Action Plan. It marks a shift in the European Union (EU) energy policy, which now structurally targets electrification as a key lever for sovereignty, climate change mitigation and competitiveness.

Electrifying energy consumption is the single most impactful lever for allowing clean energy to meet demand. Clean energy has progressed across the continent to now represent 71% of EU electricity generation, but electricity still represents only 23% of final energy consumption. The plan thus intends to give a major boost.

The most electrified economies in the EU have similar electricity mixes: increasingly dominated by nuclear and renewable energy sources. This means that they both have 1) the most incentives to keep enlarging the demand pool for electricity, and 2) the tools to feed new demand with clean, stable, affordable electricity.

Figure 1. Share of electricity in final energy consumption (2024, in %)



Source: Ifri based on "Energy Statistics—Main Indicators", Eurostat, 2026, available at: https://ec.europa.eu and "Electricity 2026", International Energy Agency, February 2026, available at: www.iea.org.

Facing severe oil and gas supply disruptions in the wake of the Ukraine and Iran wars, electrification decisively also takes on a strategic shield dimension. Cars, vans and trucks are central to this consideration, as they account for two-thirds of EU oil demand. In the EU in 2025, as one in four new cars sold was electric, the total stock of electric vehicles (EVs) on the road displaced 67 million barrels of oil, worth €4 billion.[1] EU EV sales in Q2 2026 were up 30% year-on-year, representing close to one third of new sales.[2]

As electric technology is increasingly seen as a set of tools for fighting climate change and claiming energy sovereignty, holding its manufacturing supply chains has also become highly strategic, as much as deploying the infrastructure itself. China made an early bet, and its latest Five-Year Plan (FYP) targets 35% of electrification by 2030.

The Electrification Action Plan mostly lists measures that are now up to the political will of national governments: energy taxation, spending of ETS revenues, grid planning and more. They have the responsibility to make the acceleration of electrification a reality.

France and Sweden have been the first to adopt national plans. Some of their measures contain good elements other Member States should adopt:

- Selecting territories with potential for electrification and clean generation;
- Booking grid capacity in advance for renewables;
- Preparing funding schemes for industrial electrification;
- Launching social leasing schemes for electric cars and heating;
- Designing electricity contracts to provide visibility on industrial electricity prices;
- Clarifying the electrification portfolio in government responsibilities;
- Developing energy system flexibility (still at an early stage);
- Consulting citizens, businesses, cities and researchers on acceptable policies;
- Funding in various ways, mostly redirecting existing schemes.

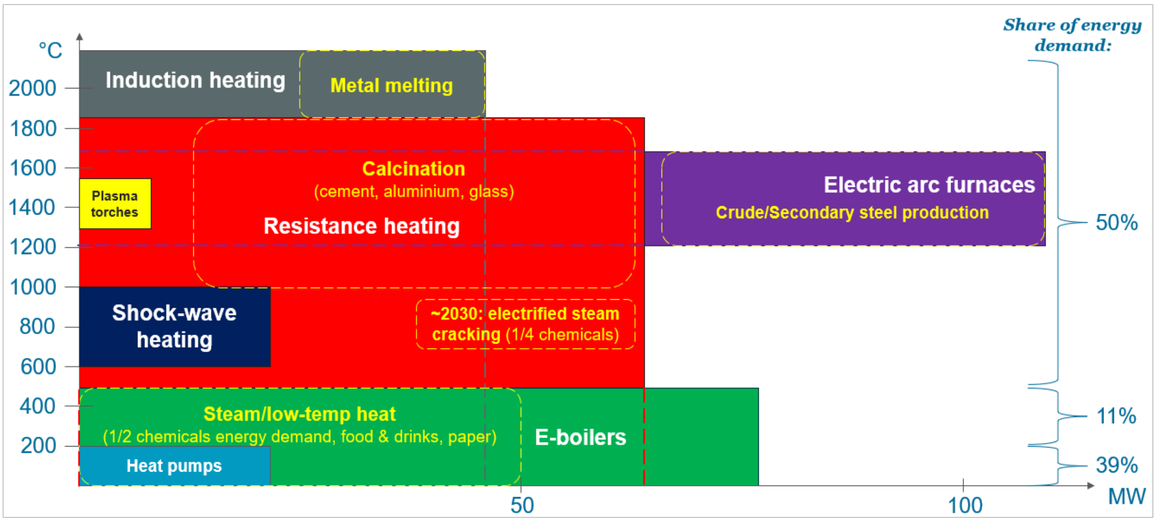
This *Memo* argues that boosting electrification across the EU requires adopting national action plans in all Member States. It lays out recommendations for boosting electrification via: 1) creating visibility, 2) making electrification the most attractive investment decision, and 3) facilitating grid connections.

High potential, low achievements

According to research, Europe's industry could technically be 90% electrified by 2035,[3] up from today's rate of 33%. To evaluate industry's ability to electrify, we may use heat generation as a basis. It is the most energy-intensive industrial process and allows for cross-sector comparisons.

1. "From Oil Dependence to Electric Security", E-Mobility Europe, June 2026, available at: www.emobilityeurope.org.
2. "Electric Car Markets in a Time of Uncertainty", International Energy Agency, July 2026, available at: www.iea.org.
3. C. Etter-Wenzel and J. Rosenow, "High Voltage: The Global Potential for Electrifying Industry", Environmental Change Institute/University of Oxford, April 2026, available at: www.eci.ox.ac.uk.

Figure 2. Industrial heating processes and electrified technology per temperature range



Source: Ifri, based on "Direct Electrification of Industrial Process Heat. An Assessment of Technologies, Potentials and Future Prospects for the EU Fraunhofer ISI", Fraunhofer ISI, study on behalf of Agora Industry, June 2024, available at: www.agora-industry.org.

Technically, electricity can replace fossil fuels for processes under 500°C, thus covering half of industry's energy demand. Heat pumps are efficient replacements for temperatures under 200°C and are in development to also cover up to 300°C. Electric boilers can be used in heat processes reaching 500°C, though with lower efficiency than heat pumps, comparable to fossil boilers.

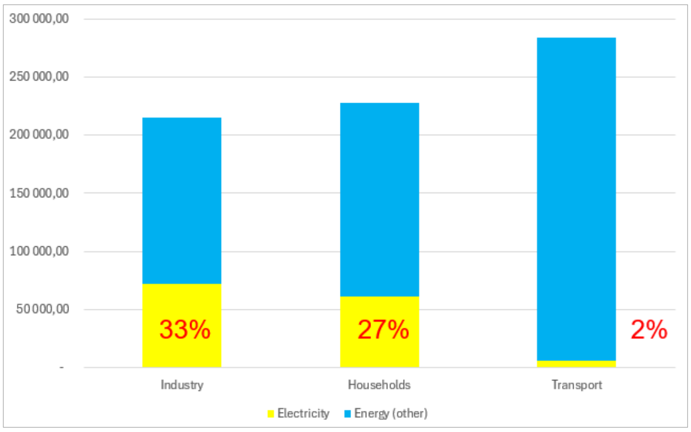
For higher temperatures, solutions exist for sectoral applications: electric arc furnaces for secondary steelmaking, resistance heating for calcination of non-ferrous metals, ceramics and glass, and electrified steam crackers are expected to become commercially available around 2030 for chemical processes. Adding indirect electrification via electrolytic hydrogen, electricity can cover 90% of industrial energy use.

A vast majority of residential heating and transport sectors can also be electrified.[4] Electric heating applications are the most efficient: the coefficient of performance (COP—efficiency of the appliance measured in the ratio between input and output of energy) of heat pumps now reach 3 (releasing more energy in the form of heat than the input of energy in the form of electricity), making them three times as efficient as gas boilers, often stuck at around 95% efficiency. The same is true for cars: while EVs can reach above 80% energy efficiency, gasoline internal combustion engines do not surpass 30%, as the rest of the energy is wasted as heat.[5] Those numbers are not just technical. Energy efficiency is a key KPI for industrials focused on cost efficiency. Electric appliances can thus, to a certain extent, compensate for the electricity-to-gas price ratio by consuming less energy for the same output.

4. Dr C. Rosslowe, "Shockproof: How Electrification Can Strengthen EU Energy Security", EMBER, October 2025, available at: https://ember-energy.org.
5. "Electric Vehicle Myths", United States Environmental Protection Agency, June 2026, available at: www.epa.gov.

However, electrification rates have been stubbornly low, stagnating at 23% for decades now. Rates vary widely across sectors. While household energy use is 27% electrified, transport is only at 2%.[6]

Figure 3. EU electrification rate per sector in 2024 (ktoe)



Source: Ifri based on "Energy Statistics—Main Indicators", Eurostat, 2026, available at: https://ec.europa.eu.

The two most cited barriers to electrification are:

- Competitiveness of electrification, resulting from the difference in operational costs between electricity and gas, and the capital expenditure of purchasing electricity-based production assets. Those prices are influenced by many factors detailed below: cost of capital, energy taxation and energy system optimization;
- Access to electricity grids. The grid buildout needs to follow the trajectory of electricity supply and demand, although construction timelines differ. Even so, grid operators need to optimize their systems.

Setting the target

The Electrification Action Plan mentions a target of 46% of electricity in final energy consumption by 2040. However, it is not binding: the EC will assess the need for an indicative target to be included in the post-2030 energy governance framework. Although political momentum is strong on the side of Energy Commissioner Jørgensen, forces still resist the temptation to set a technology-specific roadmap.

A target has a self-fulfilling element. Beyond its legal force, announcing a new national/EU objective tends to focus the efforts of many actors in the same direction. It directs the attention of business, media, academia and finance in the desired direction.

France set it at 38% by 2030 and 50% by 2050. In terms of volumes, one can either assume the target from the energy programming law (PPE 3) of 618 TWh by 2035, or

6. "Energy Statistics—Main Indicators", Eurostat, 2026, available at: https://ec.europa.eu.

660 TWh from RTE. Sweden targets an increase in yearly electricity consumption from 137 TWh in 2025 to 300 TWh in 2045 and the complete elimination of fossil fuels by then.

Member States need to provide long-term visibility for all stakeholders by embarking on a clear electrification pathway with a target expressed as a share of final energy consumption, and as volumes. This allows project developers to calibrate their projects with anticipated auctioned volumes, and for grid operators to calibrate their grid expansion plans with anticipated volumes.

Proposal 1: Adopt electrification targets in shares of energy consumption and volumes. It also allows for planning for the slowdown of oil and gas imports and related fiscal revenue changes, the progressive decommissioning of fossil infrastructure and management of oil & gas trade partners.

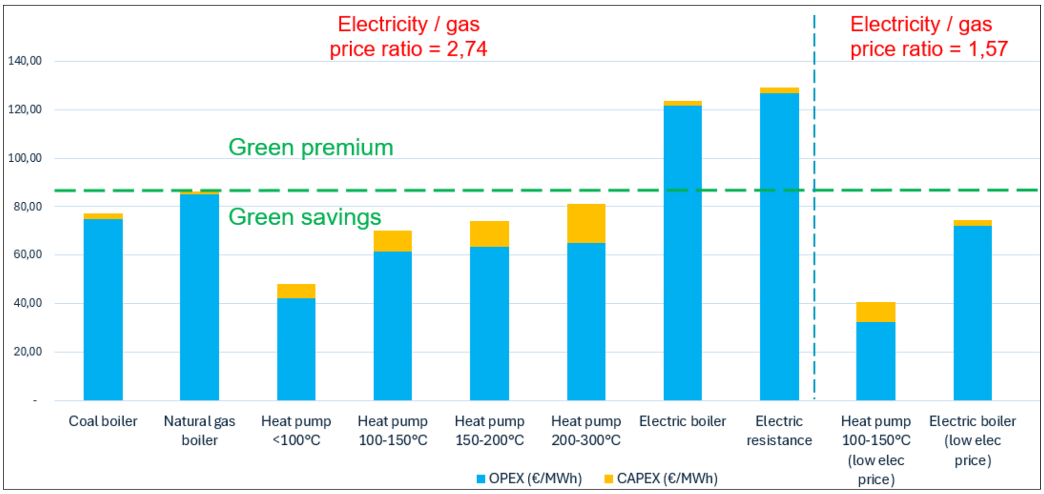
However, as described above, electric technology is often more efficient than fossil ones. Without any adjustment, it would then take higher levels of primary energy to reach the same targets. This calls for an adjustment of the Primary Energy Factor (PEF), which governs this ratio in legal accounting.

Proposal 2: Adjust the PEF to reflect the efficiency gains from electric technology and the updated electricity mix of each Member State.

Making electrification the no-regret investment decision

The most cited barrier to electrification is the additional costs compared to continued fossil fuel-led industrial processes.

Figure 4. Representation of the economics of electrifying industrial heat (EUR/MWh)



Source: Ifri, based on the following assumptions:

Electricity price high (€/MWh)	Electricity price low (€/MWh)	Natural gas (€/MWh)	ETS (€/tCO2)	Heat pump (€/kW)	Electric boiler (€/kW)	NG boiler (€/kW)	COP HP	Efficiency e-boiler	Efficiency NG boiler	Interest rate	Full load hours
117.3	67	42.8	80	870	175	100	2.3	0.99	0,93	5%	6,400

The graph above visually represents the economic decisions industries face when they want to transform their production assets. On the left side are fossil technologies. Coal and gas boilers are affordable and widely commercially available. A gas boiler consuming gas at around €40/MWh has a levelized cost of heat (LCOH—full lifecycle cost of an asset per unit of energy output) just above €80/MWh.

Heat pumps are more expensive upfront. This premium increases with temperature, especially as medium-temperature heat pumps are still in development. They consume electricity at an assumed €112/MWh in this representation, more expensive than gas. But their higher efficiency brings their overall LCOH below gas boilers, around €70/MWh. They are thus economically sensible investments in today's environments without subsidies, only with ETS prices.

Still, they may need support schemes in certain situations. They are high-CAPEX investments and therefore sensitive to varying costs of capital and commodities.

Electric boilers are needed for heat outputs exceeding 300°C. They are cheaper than heat pumps, but are less efficient. Their LCOH is thus higher and highly dependent on electricity costs. Support schemes must then adapt to the varying OPEX and CAPEX structures.

Beyond CAPEX, OPEX and cost of capital, policymakers must consider a fourth key factor: trade exposure. Chemicals, for example, face high trade intensity, as do steel and aluminum. This shows that beyond reaching cost parity with fossil fuel-led processes, those sectors worry about cost parity with international competition. This calls for a strong CBAM that protects clean European industrial processes from polluting imports, as well as policies aiming at creating lead markets for clean EU-made products.

Proposal 3: Support CAPEX investments via guaranteed and subsidized-rate loans for electric technologies such as large heat pumps to lower the risk and cost of capital.

Proposal 4: Set up social leasing for electric vehicles and heat pumps for targeted support to professionals and households that do not have the means to decarbonize their heat or transport. This can take the form of deferred payments and/or guaranteed payback times.

The graph above highlights another key message: electrification becomes significantly more attractive as electricity costs are reduced. Where the electricity-to-gas price ratio is above 2.5, heat pumps can still compete, not e-boilers. They both compete when the ratio comes closer to 1.5. Although different cost structures appear, they all show the central importance of electricity prices.

Electricity prices are determined by three factors:

- Taxation: representing ¼ of the price in the form of VAT, excise duties and other levies. On average, electricity taxation is 1.8x higher than gas taxation for households.[7] Those persistently high levels reflect the difficulty of reducing fiscal revenues at times of tight fiscal situations;

- Energy system costs: another ¼ of the price; they represent all the investments made in the network done by the system operator, recouped in the form of network tariffs. Lowering tariffs thus comes down to optimizing the use of the grid. Some users also call for capped tariffs, leaving others to compensate. This is a political decision related to the prioritization of certain consumers due to their perceived strategic nature;
- Energy supply costs: ½ of the price; these are the costs of generating electricity and supplying it to consumers. They reflect the integration of more affordable sources, the level of interconnection and the added costs of trading electricity.

Electricity taxation is a political choice. Although it represents a significant source of revenue for states (especially on industrial consumers in Italy, Poland and Germany,[8] and on households in Portugal, Denmark and Cyprus),[9] it acts as a barrier to the transformation of our economies. It should be considered alongside the potential gains from investments in electrification: domestic energy sources, jobs, productivity gains and the climate. Lowering it can be framed as an IRA-like tax credit for the transformation of the economy.

Whereas energy and climate ministries have this objective well defined in their portfolio, finance ministries generally do not. Those ministries need to cooperate and agree on a joint strategy to direct investments through a coherent fiscal policy, while compensating with other revenue sources. Anyway, it appears sensible to tax at lower rates the energy carrier that a government wishes to encourage.

Proposal 5: Lower electricity taxation and make it equal to the level of gas taxation.

Today, EU grid operators invest around €70 billion in our electricity grid each year.[10] This results in €25/MWh consumed being mutualized among all users. Those are our system costs. According to the European Grids Package, those annual investments need to reach €81-124 billion.[11] With today's consumption level, it would come to €29.2-44.8/MWh. But with electrification, enlarging the consumer base, costs could fall to €21.5-32.9/MWh.

7. "Power Barometer", Eurelectric, September 2025, available at: www.eurelectric.org.
8. "Electricity Prices Components for Non-Household Consumers – Annual Data", Eurostat, 2026, available at: https://ec.europa.eu.
9. Ibid.
10. "The State of European Power Grids: A Meta-Analysis", Aurora, December 2025, available at: https://auroraer.com.
11. Proposal for a Regulation of the European Parliament and of the Council on guidelines for trans-European energy infrastructure, amending Regulations (EU) 2019/942, (EU) 2019/943 and (EU) 2024/1789 and repealing Regulation (EU) 2022/869.

As described in a previous paper,[12] those investments are likely to increase due to additional costs related to risk preparedness: towards climate change, social acceptability, and hybrid warfare.

They can also be controlled, to be closer to the lower bound, by optimizing our grid infrastructure:

- Calculating costs of grid renewal based on risk, not simply age, as in France or the Netherlands;
- Increasing the role of the state in financing, as in Germany or Belgium;
- Remunerating grid operators' full costs, not just CAPEX, to incentivize the OPEX that optimizes grid use, as done in twenty Member States;
- Improve visibility over grid hosting capacity, as France (caparéseaux) and Belgium (Elia) are offering;
- Rolling out digital twins and direct line rating (DLR) to enable load management and make predictions to optimize investments, as done by TenneT.

Proposal 6: Optimize the use of the grid via:

- Financing: increasing the share of public financing in grid operations, encouraging anticipatory investments, reflecting OPEX in grid tariffs insofar as they allow for better management of the system;
- Planning: providing early visibility on the hosting capacity of the grid, and planning early for electrification targets in line with energy programming laws, National Energy & Climate Plans (NECPs), auction calendars and other planning tools;
- Digitalization: rolling out smart meters as well as digital twins and DLR.

Finally, energy supply costs depend on the good integration of low-cost electricity generation technologies. Electricity mix pathway decisions have been largely made already by governments. However, understanding the key levers of those costs is key:

- The levelized cost of electricity (LCOE) from various technologies: the pure cost of generating electricity over the lifetime of an asset, divided by its entire volume of electricity generated. Solar and wind have the lowest LCOE in most regions of the world;[13]
- The good integration of generation technologies: solar PV and wind increase the need for other technologies such as batteries and grid management operations to balance loads at all times and control frequency and voltage.

12. A. Daemers, "Europe's Power Grid Challenge: A Make-or-Break for Accelerating Electrification", *Ifri Memos*, May 25, 2026, available at: www.ifri.org.
13. "Levelized Cost of Energy+", Lazard, July 2026, available at: www.lazard.com.

Proposal 7: Improve the flexibility of the energy system to take better advantage of the progress made in variable renewable energy sources:

- Batteries are key in the current energy landscape and will have a major impact on electricity costs for industrials. For their integration, they require:
  - Low grid tariffs: they often pay them twice, for both withdrawal and injection;
  - Fair access to multiple markets: frequency reserves, balancing, ancillary, capacity, arbitrage;
  - Fast permitting and grid connection when hybridizing a renewable power plant;
  - Auctions for hybrid projects that account for the full LCOE of the renewable & battery assets.
- Demand-response will complement batteries by allowing industrials to benefit from variable energy prices and grid stability needs. This is often enabled by aggregators, flexibility markets or simply offers from utilities.[14] They are rendered technically possible by on-site battery storage, thermal storage such as sand, sodium, water or bricks, use of waste heat, and load shifting in electrified processes. It can be encouraged via:
  - <u>Dynamic tariffs</u>: incentivizing consumption more at low-cost, high-renewables hours;
  - <u>Access to capacity and ancillary markets</u>: a second market incentive to modulate consumption at given times to support the grid;
  - <u>Subsidy schemes</u> that include flexibility rewards.

Proposal 8: Use ETS revenues to design electrification support schemes. Here are key elements to consider:

- <u>Provide long-term certainty</u> that ETS revenues will be used for this purpose. It can be via:
  - Long-term commitments to spend at least half of ETS revenues on industrial electrification;
  - Long-term auction calendars;
  - Commitments to engage in auction-as-a-service from the Industrial Decarbonisation Bank;
  - Permanent open access mechanisms.

14. "Collection of Best Practices for Flexible Energy-Intensive Industries", SmartEN, June 2026, available at: https://smarten.eu.

- Design schemes on the basis of Carbon Contracts for Difference (CCfD). Compensate the entire green premium: the difference between fossil costs + ETS costs and the CAPEX + OPEX of electrification.
- Segment the aid by:
    - Level of heat: various cost structures need to compete separately;
    - Size of companies/processes: as SMEs and large companies have different economies of scale.
- Incentivize flexibility: add non-price criteria for the ability to provide flexibility to the grid via one of the demand-response technologies cited above. Those are avoided costs for the grid operator.
- Incentivize cost optimization: taking inspiration from the Hydrogen Bank, the aid can require candidates to apply with an MoU/terms sheet from an electricity supplier. The industrial and energy supplier would negotiate a PPA for the consumption pattern of the electric process in question. They can expect a premium to appear, associated with the cost of shaping the production pattern of variable renewable assets to the industrial's needs. The candidate would then apply for support in a competitive bidding system to compensate for this green premium. This condition could incentivize all sides to come together and limit the additional costs, thus optimizing the level of aid required.
- Be the risk-taker: even where no additional cost needs to be borne by the public, PPA negotiations can fall apart as negotiators allocate risk. The state/EU can give guarantees for PPAs in case of default,[15] as a separate mechanism from the premium-filler described above.

Facilitating grid connection

The second main barrier to electrification lies in the difficulty and length of acquiring a connection to the grid.

Grid congestion around Europe is well documented.[16] Electrification needs to be planned to allow projects to connect as soon as economics allow them to operate the switch. Planning exercises are useful insofar as they give project developers long-term visibility. But different planning exercises are too often carried out in silos, canceling this effect. National Energy & Climate Plans (NECPs) should lay out the overall climate change mitigation pathway; energy programming laws should be built upon them and give visibility into deployment and electrification targets; zoning should define the renewable/nuclear/electrification areas; and grid planning should enable all the above, building on the same hypotheses and targets.

15. Example of a PPA guarantee scheme in France operated by Bpifrance: www.bpifrance.fr.
16. "The State of European Power Grids: A Meta-Analysis", op. cit.

In the real world, this materializes with certainty for the developers that auctions will be run, land permits will be awarded, and grid connection will be quickly available.

Proposal 9: Align calendars for all planning exercises around the electrification goal.

Renewables have benefited from the design of Renewable Acceleration Areas (RAAs) as part of the Renewable Energy Directive (RED) permitting measures.[17] These are land areas designated by the state where permits will be given faster and more easily for renewable energy projects, usually because there is no other use for this land (e.g., degraded industrial land).

In France, this comes in addition to S3RENR: substations reserve connection capacity for renewables around the country. This is easy to see on the website: caparéseau.[18]

The same approach can be taken for electrification projects: design electrification hubs where permits are awarded more easily, grid connection is reserved, and the state prepares a strategy to support electrification (e.g., subsidies, training, access to affordable electricity). Grid operators can use this visibility to launch anticipatory investments, with the certainty that newly built grid capacity will eventually be used by new grid-connected assets in the future.

Proposal 10: Identify electrification hubs where permits and grid connections are awarded faster thanks to reserved slots.

This can also be a general rule for grid connection queues. Grid operators are already moving away from the “first-come-first-served” rule towards a “first-ready-first-served” rule. The idea is to move projects up the queue if they show progress in areas other than grid connection, suggesting they are likely to materialize. This solves one issue: ghost projects making queues artificially longer.

Governments and grid operators are also starting to make key decisions to prioritize certain uses for public interest reasons. Cyprus is prioritizing hospital connections, Greece is pushing up water infrastructure, while Denmark has de-prioritized data centers.[19]

As every industrial site receives a grid connection to electrify its process, it creates the space and need for new generation and flexibility projects to come in as well.

Currently, most operators do not even differentiate between generation, storage and consumption projects in queues. Considering their different uses in the system, each satisfying different needs, it appears logical to split all three into categories, all assessed separately by the grid operator:

17. Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) (Text with EEA relevance).
18. RTE publicly accessible map of grid capacity, April 2026, available at: www.services-rte.com.
19. Recently placed fourth in the priority list envisioned in Denmark’s 2026 New prioritization model: en.energinet.dk.

- A highly congested grid signals that more demand can be connected;
- Negative prices and curtailment signal that more storage can be connected;
- High energy prices signal that more renewables can be connected.

Proposal 11: Split generation, storage and demand in grid connection queues and prioritize one or the other based on pre-determined system signals. Most areas in Europe currently signal the need to prioritize electrification and flexibility, which in turn allows more generation to connect.

Proposal 12: Organize an annual electrification benchmark conference to track progress in the 27 Member States and key sectors, exchange best practices, and support the effort.

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