

eurelectric

A hand is shown holding a glowing blue ring, which is the logo for eurelectric. The ring is illuminated from within, creating a bright blue glow. The hand is also lit with a blue light, and the background is dark. The overall image has a futuristic and technological feel.

Power Barometer




Who is Eurelectric?

Eurelectric is the federation for the European electricity industry. We represent the power sector in over 32 European countries, speaking for more than 3,500 companies in power generation, distribution and supply.

We contribute to the competitiveness of our industry, provide effective representation in public affairs and promote the role electricity in addressing the challenges of sustainable development.

We draw on more than 1000 industry experts to ensure that our policy positions and opinions reflect the most recent developments in the sector. This structure of expertise ensures that Eurelectric's publications are based on high-quality input with up-to-date information.



About the Power Barometer

Welcome to the first edition of the Eurelectric's Power Barometer!
We have compiled this unique publication to stress the potential that electricity holds for Europe's industry and for the future of our continent.



Electricity brings light to the streets, it powers our homes and factories. It is the foundation of our daily lives and the backbone of our society. Today, it becomes inherently evident that it is the key solution to decarbonise Europe.

The Barometer brings together compelling evidence and data demonstrating our sector's steady pathway to carbon neutrality. As we are marching towards a full decarbonisation, with ever greater volumes of renewables and a plummeting carbon intensity, we are convinced that we can serve Europe decrease its emissions drastically. With the right measures, electricity can become the solution to other sectors' decarbonisation.

The new mandate of the EU institutions will be a crunch time for policymakers and industry to deliver on the commitments made to the future generations. I invite you to join us in exploring how the power of electricity can transform our world.


Kristian Ruby
Secretary General
of Eurelectric

A handwritten signature in black ink, appearing to be 'KR' followed by a flourish.

Table of Contents



1. Power generation marching towards full carbon neutrality	1
2. EU electricity CO ₂ intensity dropping at accelerated pace	3
3. Europe missing out on the potential of clean power	5
4. Speeding up on charging points' deployment: a must to keep up with expected e-mobility growth	7
5. Massive power grid investment needed to accompany the boost in renewables and electrification	9
6. Low wholesale prices unable to provide the needed investment signals	11
7. Household bills burdened by high taxes and levies	13
8. Historical overcapacity turning into regional security of supply challenges	15
Interview with Magnus Hall	19
Interview with Leonhard Birnbaum	20
Interview with Pat O'Doherty	21

An aerial photograph of a forest with a winding path, overlaid with a blue and green color gradient. The text is centered in the lower half of the image.

EU power indicators:
**where does the
barometer point to?**



1 Power generation marching towards full carbon neutrality

WHERE ARE WE TODAY?

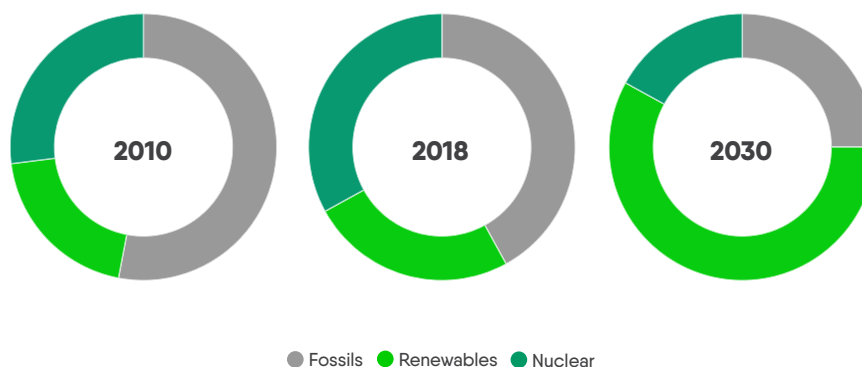
In 2018, 58% of all EU electricity came from carbon-neutral sources: 32% came from renewables (wind, hydro, biomass and solar)¹ and 26% came from nuclear. Since 2000, the amount of electricity produced with renewables increased by as much as 150%, whereas fossil electricity dropped by 17%. The fastest growing technology is wind with a 90% increase over the period.

By 2030, three quarters of all electricity is expected to be carbon free. Indeed, the agreed target of 32% renewables economy-wide by 2030 will require renewables to reach +/- 57%² in the power sector. Combined with the contribution from nuclear, at least three quarters of all electricity generation is expected to be carbon free by 2030.

WHERE DO WE NEED TO GO?

- > The European Commission's long-term strategy confirms that in order to meet the 2030 targets, the share of renewables in electricity production must reach 57%.
- > A major study carried out by Eurelectric shows that the power sector could reach carbon neutrality by 2045³ in a cost-effective way, with renewables representing over 80% of the total electricity production.

in %



Source: [Eurostat](#) (for 2010), [Sandbag](#) (for 2018), [Eurelectric](#) (for 2030)

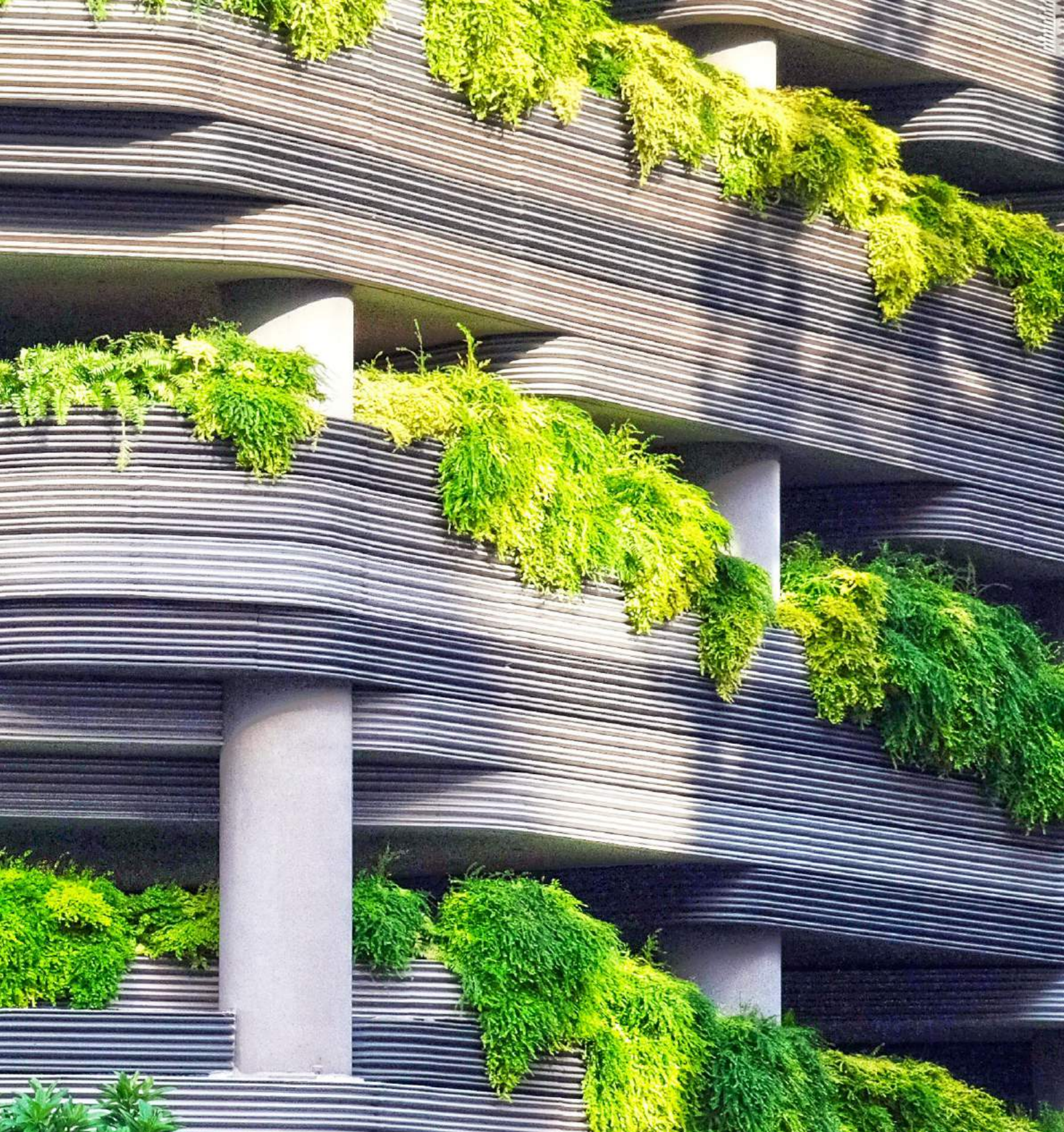
¹ Total RES electricity = 32.3% (11.8% wind, 10.6% hydropower, 6.1% biomass and 3.9% solar)

² Long Term Strategy, European Commission, 2018

³ Power industry Vision statement, Eurelectric, 2017

WHAT DO WE RECOMMEND?

- > **Create an efficient market-based investment framework and an adequate electricity market design** to trigger investments in a high renewables-based system, including in carbon-neutral back-up capacity.
- > **Implement the Clean Energy Package** and continue to implement an integrated European market through better coordination of national and EU energy policies.
- > **Let markets work**, avoiding as much as possible distortions and political interventions. In addition, streamline permitting processes and legal frameworks.
- > **Tackle public acceptance issues** with best practice tools, including an active involvement of citizens.



2 EU electricity CO₂ intensity dropping at accelerated pace

WHERE ARE WE TODAY?

The carbon intensity of electricity started declining in 1990 and **plummeted by 43%⁴ between 1990 and 2018**. A kWh of electricity produced in the EU emits on average 296 g CO₂/kWh⁵. This solid downward tendency shows that electricity is a solution to fight climate change compared to other energy carriers which emit much more.

WHERE DO WE NEED TO GO?

- > The European power sector is **committed to deliver carbon-neutral power supply by 2045**.
- > **Decarbonising the power sector by 2045 will require 100bn/year of investments in generation and storage**.
- > Member States have different starting points in terms of power mix. A fair and inclusive transition with the necessary support is therefore required.

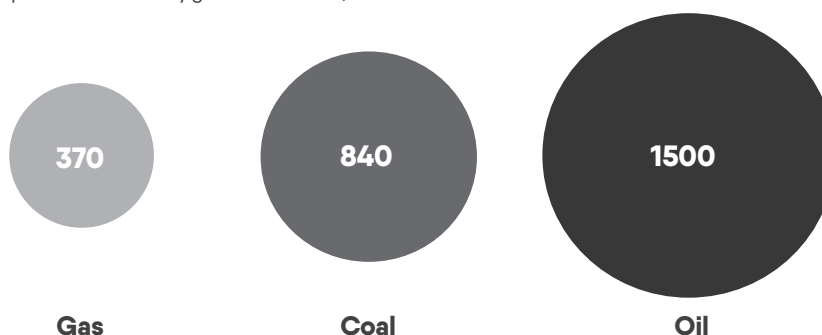
Electricity CO₂ emissions are dropping fast...

g CO₂/kWh



...and are far less than those of fossils

gr CO₂/kWh (emitted in the process of electricity generation in 2018)



Source: Eurelectric, Eurostat, [Umwelt Bundesamt](#) & [ADEME](#)

⁴ [The European Power Sector in 2018 - Sandbag](#)

⁵ <https://www.electricitymap.org>

WHAT DO WE RECOMMEND?

- > **Stop penalising electricity:** taxes and levies should provide efficient and stable signals for decarbonisation and should be harmonised across energy carriers.
- > Review the 2013 TEN-E Infrastructure Regulations as soon as possible to reflect the changing infrastructure and security needs.
- > **Dedicate funding for Member States that face a more difficult starting point** in the electrification and energy transition journey.
- > **Create a Just Energy Transition Fund** under the next Multiannual Financial Framework to support carbon intensive regions, considering the commercial availability of transition technologies and specific needs of vulnerable consumers.



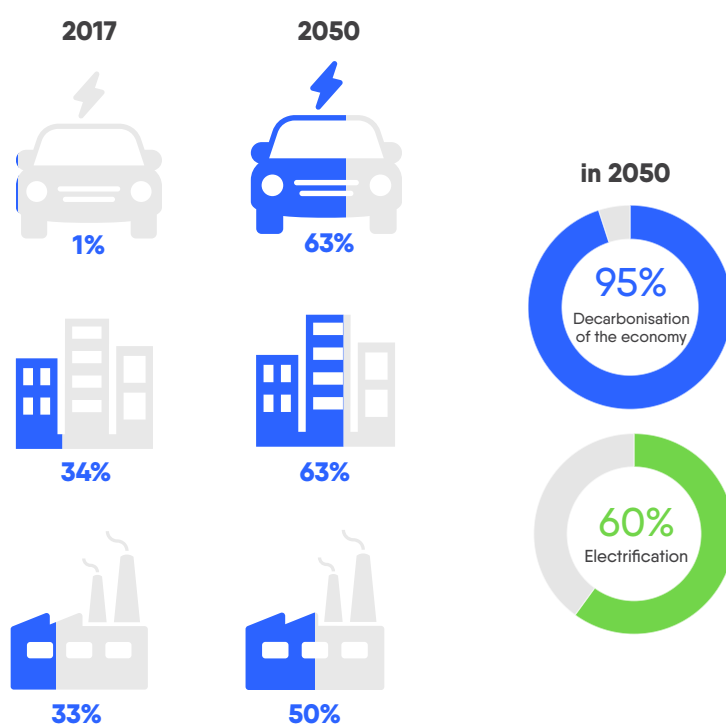
3 Europe missing out on the potential of clean power

WHERE ARE WE TODAY?

Electricity is a key solution towards Europe's decarbonisation. Yet, figures show that **clean power can do much more**. Electricity today represents only 22% of direct energy consumption⁶, a figure that has increased by only 5% since 1990. The level of electrification varies across sectors: it reaches 33% in industry, 34% in buildings and a mere 1% in transport. **Transport is evidently the sector where most untapped potential remains available and where determined action is most urgently needed.**

WHERE DO WE NEED TO GO?

- > Electrification, coupled with the full decarbonisation of the power sector is a direct, effective and efficient way of reaching decarbonisation objectives for society as a whole.
- > For the EU to reach 95% energy emissions reduction by 2050, **direct electrification needs to supply close to 60% of final energy consumption**, compared to 22% today.



Source: [Eurelectric](#)

⁶ Direct electrification defined as share of electricity consumption within Total Final Energy Consumption

WHAT DO WE RECOMMEND?

- > **Adopt a long-term EU strategy to deliver on the Paris objectives that recognises the importance of electrification and ensure that National Energy & Climate Plans propose concrete measures to facilitate it.**
- > **Stop penalising electricity:** taxes and levies should provide efficient and stable signals for decarbonisation and should be harmonised across energy carriers
- > **Accelerate innovation in electrification and allocate sufficient Research & Innovation funds** for improving clean electric solutions for hard-to-abate sectors like industry, maritime and aviation.
- > Set up an **EU Electrification Observatory** to identify the best available solutions, monitor consumers' uptake and inform decision making.



4 Speeding up on charging points' deployment: a must to keep up with expected e-mobility growth

WHERE ARE WE TODAY?

In 2018, the total number of Electric Vehicles (EVs) on European roads reached 1.42 million including passenger cars, buses, light and heavy duty vehicles. **The pace of development of e-mobility is set to tremendously speed up.** By 2030, in application of the EU Clean Transport Package agreed in 2019, this number must come to no less than 40 million. While EVs represented 2.5% of all new vehicle sales in 2018, it is clear that this trend will accelerate. To get there however, the deployment of charging points must accelerate. **By 2025 at least 3.36 million charging points must be available throughout Europe.** This requires effective and coordinated action from all policymakers and developers to face the boost of electric vehicles in their market and adapt to transit and tourism needs. Less than a decade ago, the range of the top-selling EVs on the market was no more than 160km. In 2019, some of the top selling EVs have a range of over 450km. The main driver in this process is the battery – increasing efficiency and cheaper costs.

WHERE DO WE NEED TO GO?

- > **By 2030, 40 million EVs** (battery and plug-in hybrid) need to hit the road.
- > **Political and financial support are needed for the development of smart charging and services** so that EV charging does not create constraints on the electricity distribution grid.

Electric vehicles

x40 in 2030 vs today

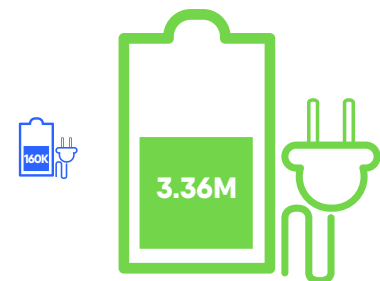
in Millions



- Number of EVs in 2018 ● Needed electrification by 2030
- Total number of cars on the road

Charging points

x21 in 2030 vs today



- 2018 ● 2030

Source: Eurelectric analysis

WHAT DO WE RECOMMEND?

- > Have 3.36 million charging points available throughout Europe by 2030.
- > **Promote common EU standards** for the interoperability of public charging infrastructure.
- > **Revise the Alternative Fuels Infrastructure Directive (AFID)** to support the shift to zero-emission mobility with the needed infrastructure:
 - > Implement alternative metrics to assess whether the charging infrastructure has sufficient coverage, taking into account charging behaviour, charging power, charging locations, demographic conditions and expected vehicle sales. Adjust the National Policy Frameworks under AFID in consequence.
 - > Allow public and private partners to apply for direct EU-funds for infrastructure deployment with a focus on high power charging. This can be done by extending the coverage of AFID to “TEN-T Comprehensive networks” as well as to urban nodes.



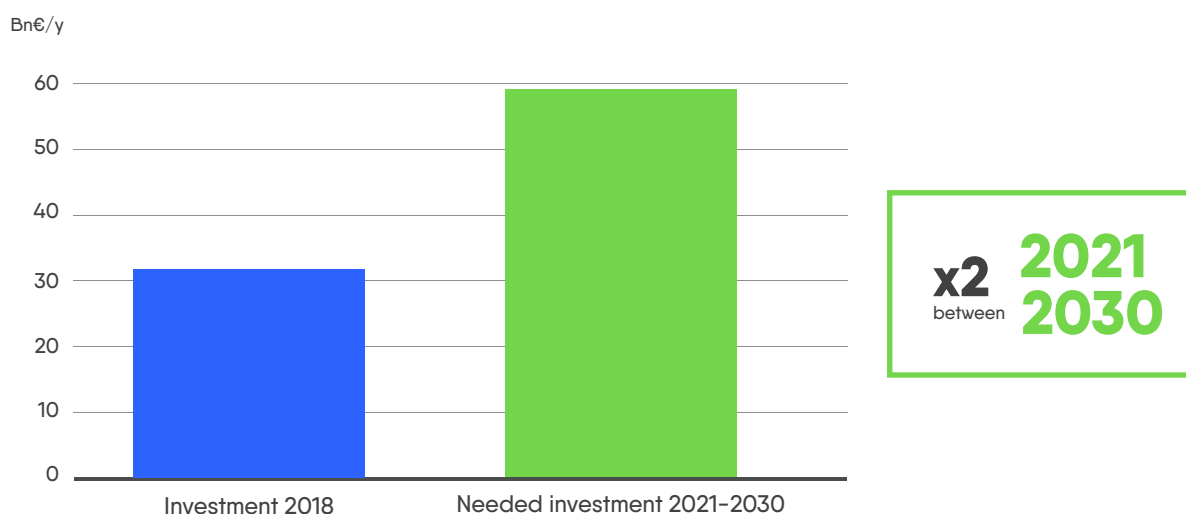
5 Massive power grid investment needed to accompany the boost in renewables and electrification

WHERE ARE WE TODAY?

In 2018, the 30 billion euros were invested in EU's distribution networks (i.e. 85.7% of the total EU grid spending) and 3.5 billion euros in transmission networks. However, these investments, especially in the distribution grid, need to **at least double in the next decade**. The European Commission estimates **the average investment needed for power grids in the 2021–2030 horizon between 60 and 110 billion euros per year**⁷.

WHERE DO WE NEED TO GO?

- > Considerable investments in networks will be needed to accommodate challenges such as the integration of more decentralised resources, digitalisation, smart metering, charging infrastructure for e-mobility, and access to local flexibility resource, and to replace the current ageing infrastructure while maintaining high quality of service⁸.



Source: IEA (WEI 2016, 2017, 2018 & 2019), [EC Long term Strategy](#)

⁷ EC long term strategy 2018

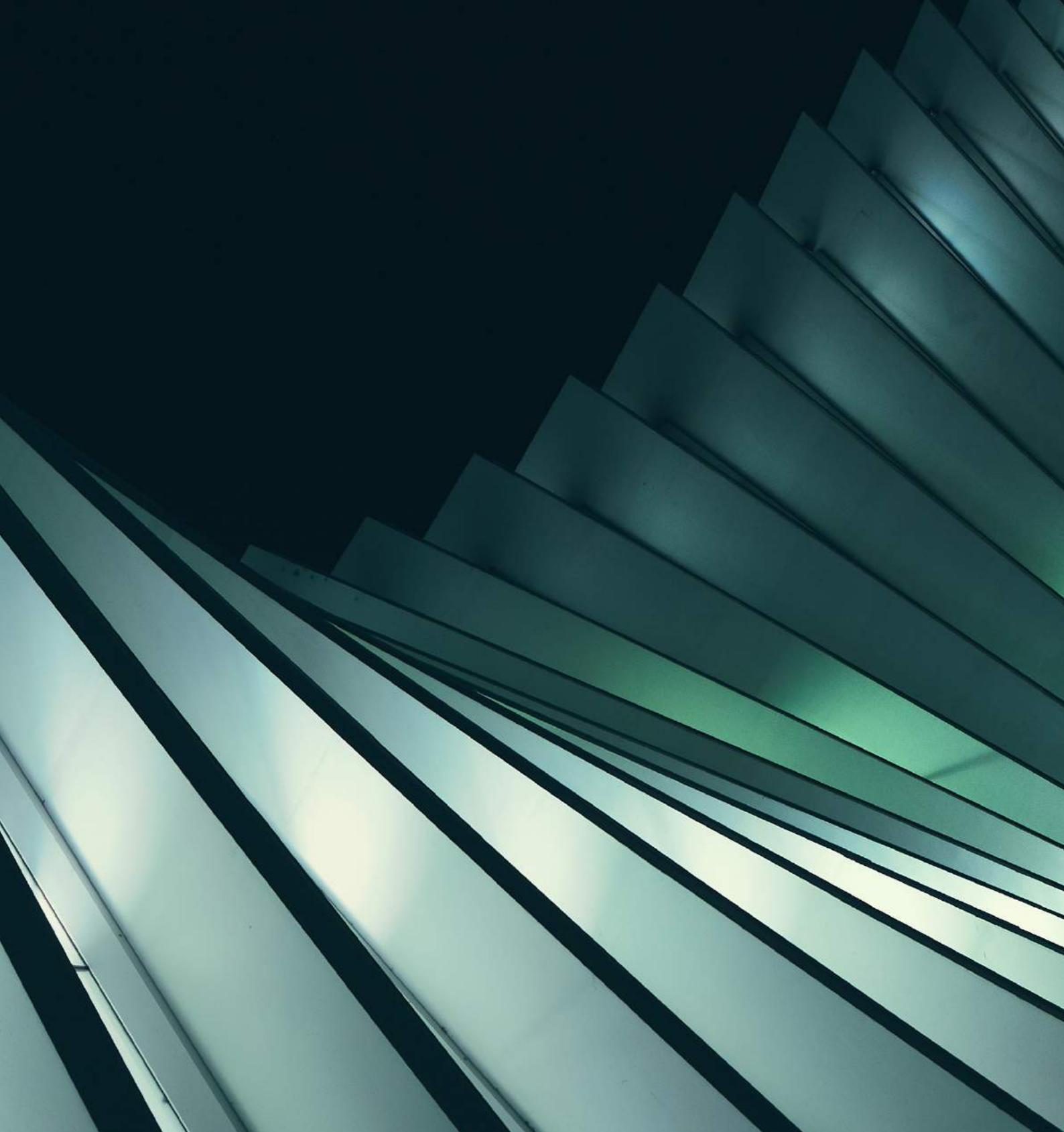
⁸ IEA World Energy Investment Outlook (2014)

⁸ EC Energy Roadmap 2050 (2011)

⁸ [Eurelectric & EY. Where does change start if the future is already decided.](#)

WHAT DO WE RECOMMEND?

- > **Promote the role of DSOs as neutral market facilitators, incentivise them to innovate and use flexibility** through upgraded, fair and efficient network pricing and market platforms.
- > **Introduce smart network tariffs:** take advantage of smart meters to introduce smart network tariffs that give efficient signals to distributed generation and storage, demand electrification.
- > Reassess the 2013 TEN-E Infrastructure Regulations as soon as possible to reflect the changing infrastructure and security needs.
- > **Improve network regulation:** improve efficiency and performance incentives in network regulation.



6 Low wholesale prices unable to provide the needed investment signals

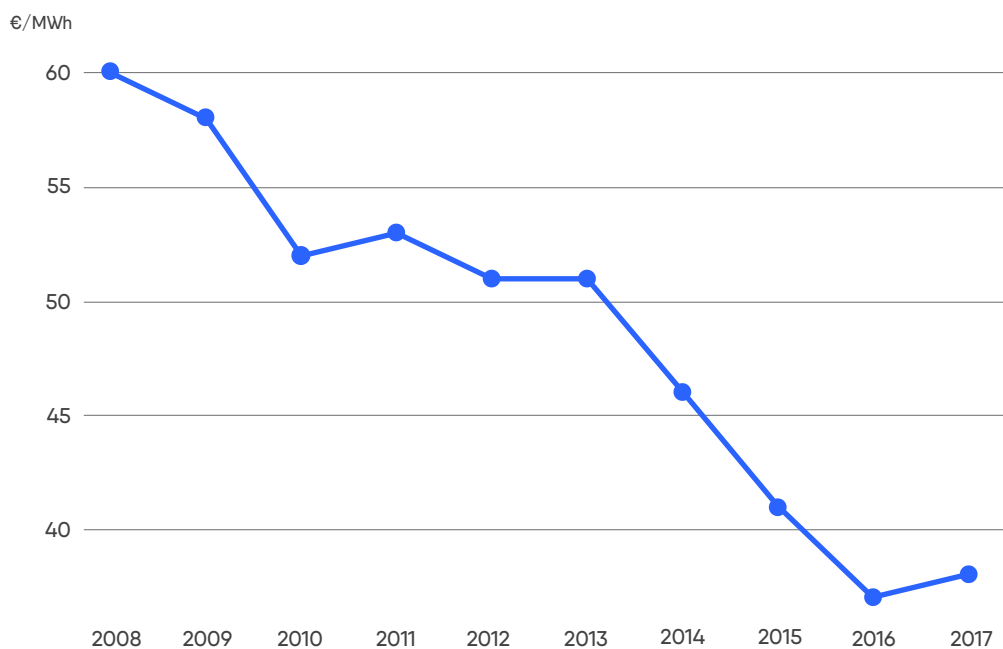
WHERE ARE WE TODAY?

Between 2008 and 2017, average wholesale electricity prices in Europe have constantly declined. The increasing amount of renewable capacity brings short-term wholesale prices to very low levels, and occasionally results in zero or negative prices. **This is insufficient to ensure the needed investments**, in particular in flexibility but also in firm and reliable capacities, to reach the decarbonisation objectives. In the meantime, EU Member States' average annual wholesale prices have converged thanks to strengthened market integration.

There is currently an increased risk of very low, zero or even negative prices at times of high renewables output. In order to recover their fixed costs, generators will have to rely more and more on price spikes, which are, as of today, extremely rare.

WHERE DO WE NEED TO GO?

- > **Market based mechanisms and an efficient market system are key to provide long-term price signals**, which will trigger the investment in the capacity needed to ensure security of supply.
- > Undistorted competition and free price formation should allow generators to a profitable business in the European power markets.



Source: [ACER Market monitoring report](#)

WHAT DO WE RECOMMEND?

- > **Ensure a rigorous implementation of the newly adopted Clean Energy Package** leading to an integrated functioning European power market.
- > **Improve the investment environment through predictable market-based frameworks and appropriate power market design**, allowing innovative business models to be tested.



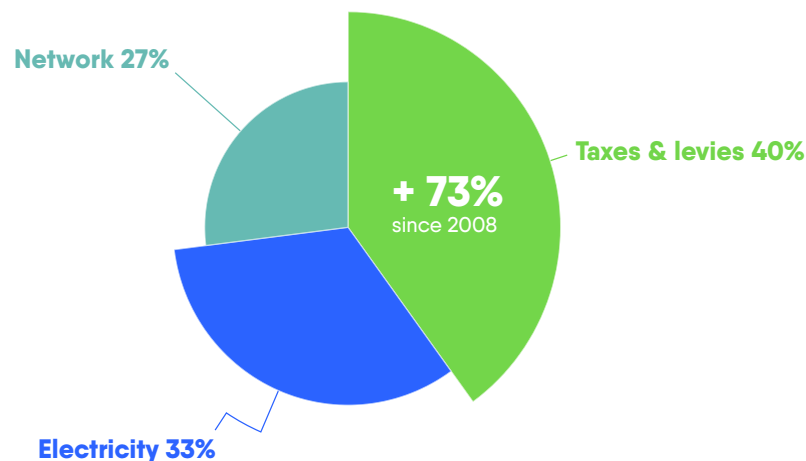
7 Household bills burdened by high taxes and levies

WHERE ARE WE TODAY?

Retail prices include three components: taxes and levies, network and energy. According to the [2018 EC Energy prices and costs in Europe](#), in 2017, energy costs represented on average 33% of the final electricity price while the remaining 67% were formed by the network costs, taxes and levies. **Since 2008, the share of taxes and levies in the retail price have increased by 73%.** In the meantime, network costs remained stable. This evolution of retail prices for household consumers clearly underlines the **wholesale electricity prices decrease** and the improvement of markets functioning.

WHERE DO WE NEED TO GO?

- > **The weight of taxes and levies equates that of energy and supply in the bill of a residential consumer.** In addition, **the way regulated costs are charged to consumers is exacerbating the price increase.** Addressing these regulatory inefficiencies is a prerequisite for a cost-efficient decarbonisation of the power sector. This should become a priority of the EU energy policy reform.
- > **Member States shall bring down the share of policy support costs in the electricity bill and finance decarbonisation in a less distortive way.** The introduction of tax credits or spreading the costs over other energy carriers could be the way forward.



Source: [European Commission](#)

WHAT DO WE RECOMMEND?

- > Ensure the **effective implementation of the Clean Energy Package and of the Consumer Package that enable consumer participation and protection in the transition.**
- > **Ensure that climate action costs are not disproportionately placed on the electricity bill,** by lowering or removing the non-energy costs such as taxes and levies in the electricity price.
- > **Stop penalising electricity:** taxes and levies should provide efficient and stable signals for decarbonisation and should be harmonised across fuels.



8

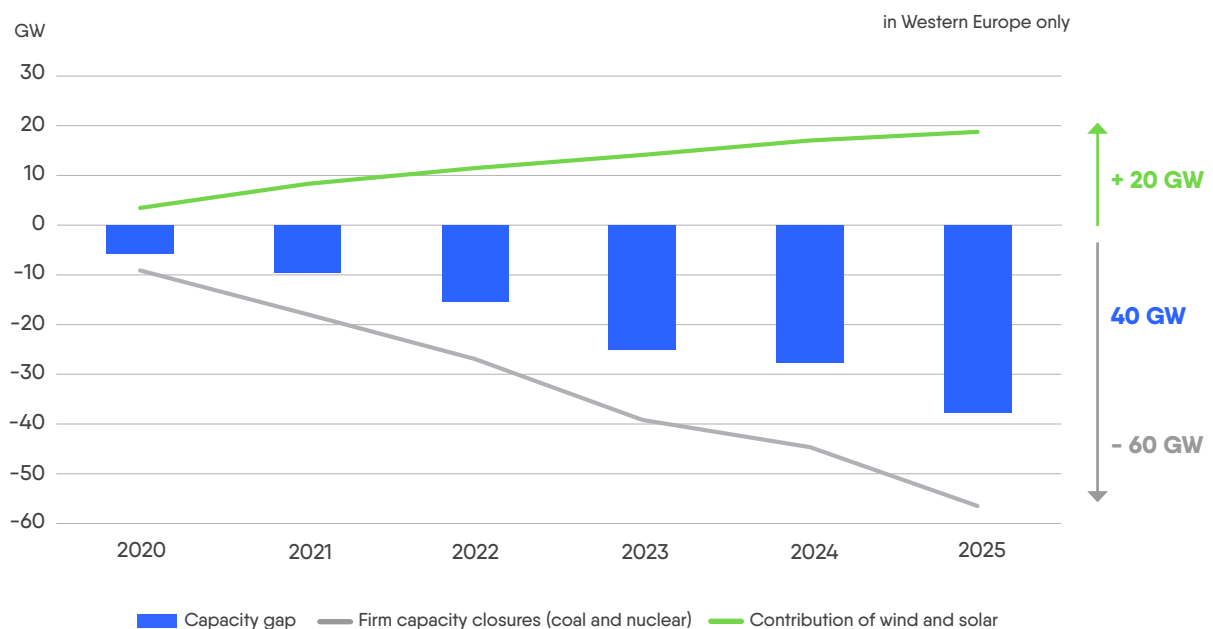
Historical overcapacity turning into regional security of supply challenges

WHERE ARE WE TODAY?

The acceleration of climate and environment policies could lead to a significant number of Member States facing security of supply risks by 2025 due to the removal of existing traditional power plants. In Western Europe, a total of 40GW of coal and 20GW of nuclear are set to close by 2025. This opens a significant capacity gap for the region as the foreseen capacity additions that will result from renewables over the same period will only make a limited contribution to security of supply. Similar trends are observed in the East of Europe with the Czech Republic recently announcing the establishment of a coal commission to look into coal phase-out. Overall, the outlook on power system adequacy for the whole of Europe is concerning.

WHERE DO WE NEED TO GO?

- > **To bridge the capacity gap, flexibility and carbon neutral back-up capacity will be crucial.** Storage, power-to-X and demand side response will be key to ensure that enough flexibility is provided to prevent and address adequacy problems.
- > **Enhanced regional cooperation and deeper market integration.** A rigorous implementation of the Clean Energy Package, will be needed to ensure security of supply.



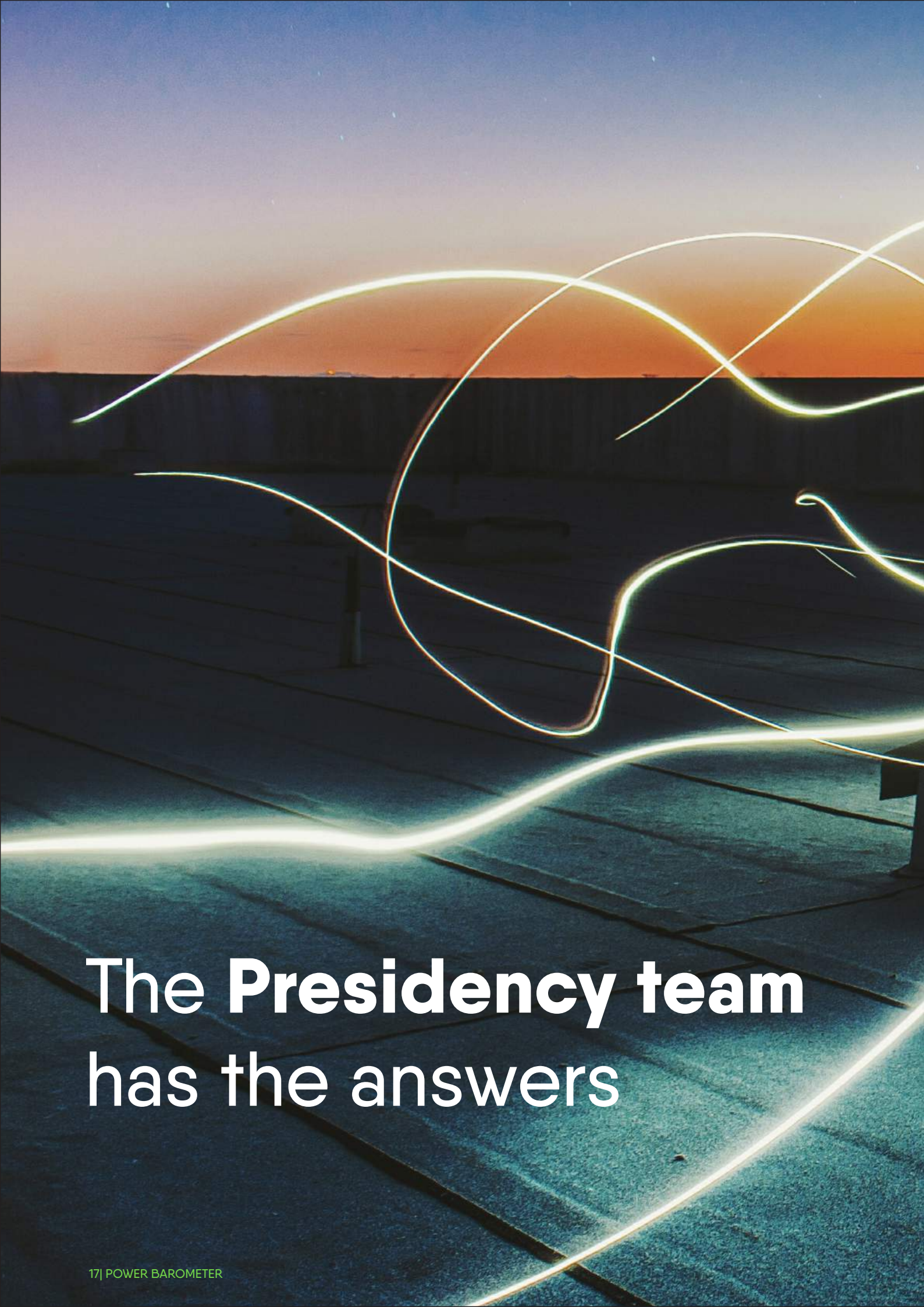
Source: Platts, European Power Daily, 2019

⁹ ENTSO-E's [2018 Mid-Term Adequacy Forecast](#) (MAF). ENTSOE modelled the removal or mothballing of 23GW of thermal capacity by 2025, which is a conservative assumption looking at recent announcements in e.g. Belgium or Czech Republic

¹⁰ Platts, Power in Europe, 12th August 2019⁴ Power industry Vision statement, Eurelectric, 2017

WHAT DO WE RECOMMEND?

- > **Enhance electricity market integration** to contribute to efficient and least cost market decisions.
- > **Ensure security of supply with an increased societal reliance on electricity, security of supply is of strategic importance for the transition.**
- > **Back-up plants that only run a few hours per year. Storage assets and demand response are necessary in a system with very high shares of variable renewables.** As long as scarcity pricing is not credible in many markets, and where scarcity situations are rare and sudden events, it may be necessary to consider capacity markets as an alternative.
- > **Review energy and environment state aid guidelines** to ensure a level playing field for investments in carbon neutral sources, all transition enabling technologies and security of supply.
- > **Improve European and regional adequacy assessments** in line with the Clean Energy Package and use a wider and more realistic set of assumptions which reflect the economic viability of power plants.



The **Presidency team**
has the answers





Magnus Hall

President of Eurelectric,
President and CEO of Vattenfall

What is needed to accelerate electrification?

We see more and more undeniable evidence that electrification offers the most cost-effective pathway to decarbonising a significant part of our society and, as a result, mitigating climate change. We are ready to work with the EU institutions during the new mandate on concrete and positive targets for electrification of European economy.

First, the barriers to electrification across Europe need to be identified in order to develop a strategy to overcome them. Then, we need to ensure that the existing best practices of the power sector are widely implemented. In this context, the electricity industry needs to build and reinforce strong synergies with other sectors, such as transport, heating and energy-intensive industries, with smart and resilient electricity infrastructure as the crucial backbone of the future energy system.

The vision we have of our sector and the responsibility we took in the energy transition need to be materialised and put into action through roadmaps. These roadmaps should take into consideration the different starting points and social responsibility of each region and country in Europe. We have to make this transition just and fair.

Electrification holds an enormous potential for our society, and the EU policies need to support its full realisation on the path of achieving carbon neutrality for the sake of future generations.



Leonhard Birnbaum

Vice-President of Eurelectric,
Chief Operating Officer E.ON SE

How can we make distribution grids smarter?

Electrification is key to achieving Europe's ambitious decarbonisation goals. The distribution system is central to this. In the new energy world the citizens' relationship with the energy system is changing. As well as consuming energy, they are now able to produce it. At the same time the distribution system is becoming the main location for the connection of weather dependent renewables and must adapt to the increase in e-mobility, smart meters, smart customer solutions, storage and much more.

In this more dynamic environment, distribution networks need to do more than move power from A to B. They will need to take an active role in managing inputs and outputs, correcting imbalances, and continuing to maintain a reliable network. This can only be achieved if grids become smart, digital and flexible, requiring substantial innovation and investment.

Distribution system innovation and digitalisation should be encouraged by regulators. Policymakers need to implement solutions that provide financial incentives to encourage grid operators to further embrace new technologies and activities. Therefore ensuring we are building a smarter European grid, not just a bigger one.



Pat O'Doherty

Vice-President of Eurelectric,
Chief Executive of ESB

What is needed to get consumers on board of the energy transition?

To effectively transition to a low carbon energy future and maximise the efficiencies of digitalised and distributed electricity system, we need to completely reimagine the electricity sector with the customer at the centre.

Technology is giving customers more options, enabling them become generators as well as consumers of energy, and to provide flexible services to the grid. Ultimately, it will be the willingness of ordinary citizens to adopt new technologies and actively engage with the energy system that will determine the pace and scale of decarbonisation.

Suppliers have a critical role to play in helping customers to navigate emerging technologies, and helping them to understand in practical terms, the costs and benefits of the transition. We need to build trust by developing relevant and compelling products and services that will genuinely make life better, while also maintaining affordability and security of supply.

eurelectric

Union of the Electricity Industry - Eurelectric aisbl
Boulevard de l'Impératrice, 66 - bte 2 - 1000 Brussels, Belgium
Tel: + 32 2 515 10 00 - VAT: BE 0462 679 112 • www.eurelectric.org
EU Transparency Register number: 4271427696-87