Changing fundamentals in power price outlook

April 4th, 2024

SEE Energy Day in Belgrade

Agenda

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I. About Aurora

II. Key drivers shaping the European electricity market

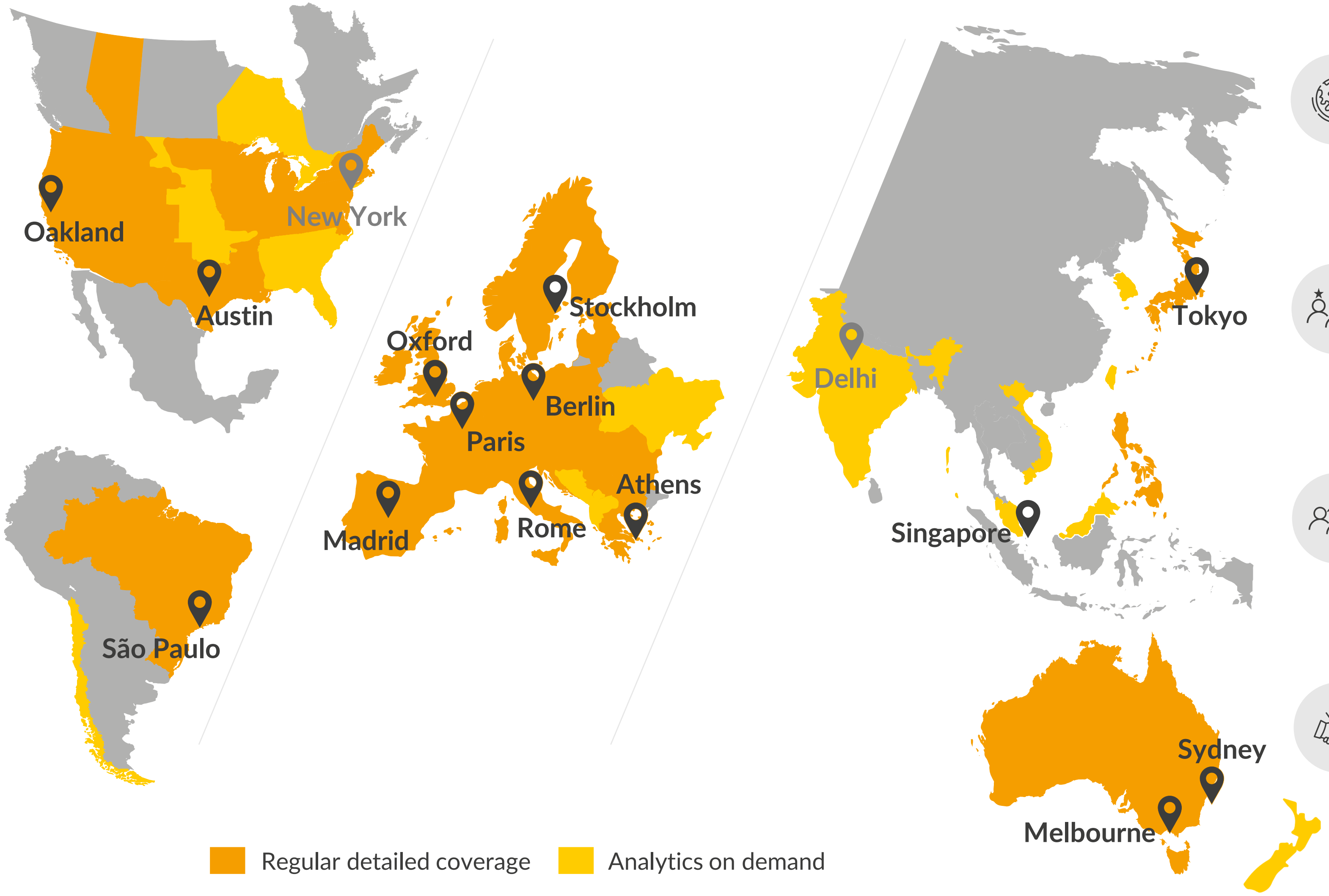
1. Policy on decarbonization
2. Increased electrification
3. Commodity prices projections
4. Carbon pricing
5. Auctions in Serbia

III. Aurora’s forecast for Serbian baseload prices and renewables’ capture prices

IV. Routes to market for Serbia and the SEE region

Aurora provides market leading forecasts & data-driven intelligence for the global energy transition

- Power markets
- Renewables & PPAs
- Storage
- Electric vehicles
- Hydrogen H_2
- Carbon CO_2
- Natural gas



14 offices and two more coming soon

600+ market experts

850+ subscribing companies

150+ transactions supported in 2023

Source: Aurora Energy Research

Unique, proprietary, in-house modelling capabilities underpin Aurora's superior analysis

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4 Integrated Models

- **Hydrogen (AER-HY)**
- **Carbon (AER-ETS)**
- **Power markets (AER-ES)**
- **Global Commodities & Gas (AER-GLO/GAS)**

INPUTS

- Technology
- Policy
- Demand
- Commodity prices[1]
- Weather patterns

Dispatch model

- ½ hourly or hourly
- Iterative modelling
- Dynamic dispatch of plant
- Endogenous interconnector flows

Continuous iteration until an equilibrium is reached

Investment decisions module

- Capacity market modelling
- Capacity build / exit / mothballing
- IRR / NPV driven
- Detailed technology assessments

OUTPUTS

- Capacity mix
- Generation mix
- Wholesale & imbalance prices
- Capacity market prices
- Profit / Loss and NPV
- Electric vehicle charging

1) Gas, coal, oil and carbon prices fundamentally modelled in-house with fully integrated commodities and gas market model

Source: Aurora Energy Research

Aurora models the integrated European power market down to the individual plant level to account for interdependencies

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Overview

- We model the power markets of most European regions that affect the Greek power market at the same level of detail and with the same modelling approach as the Serbian market:
  - Capacities in these countries develop driven by the economics in the respective market or based on existing policies and government goals.
  - Plants in these markets are dispatched in the same manner as in the Serbian market, and the overall system optimises allowing for endogenous use of grid interconnection capacities.

Benefits of this modelling approach

- Interdependencies of prices, capacities and generation patterns in different regions are captured and considered in one integrated market model.
- Interconnector flows are modelled endogenously and react to price differentials in between countries, displaying the interaction of the European power markets.

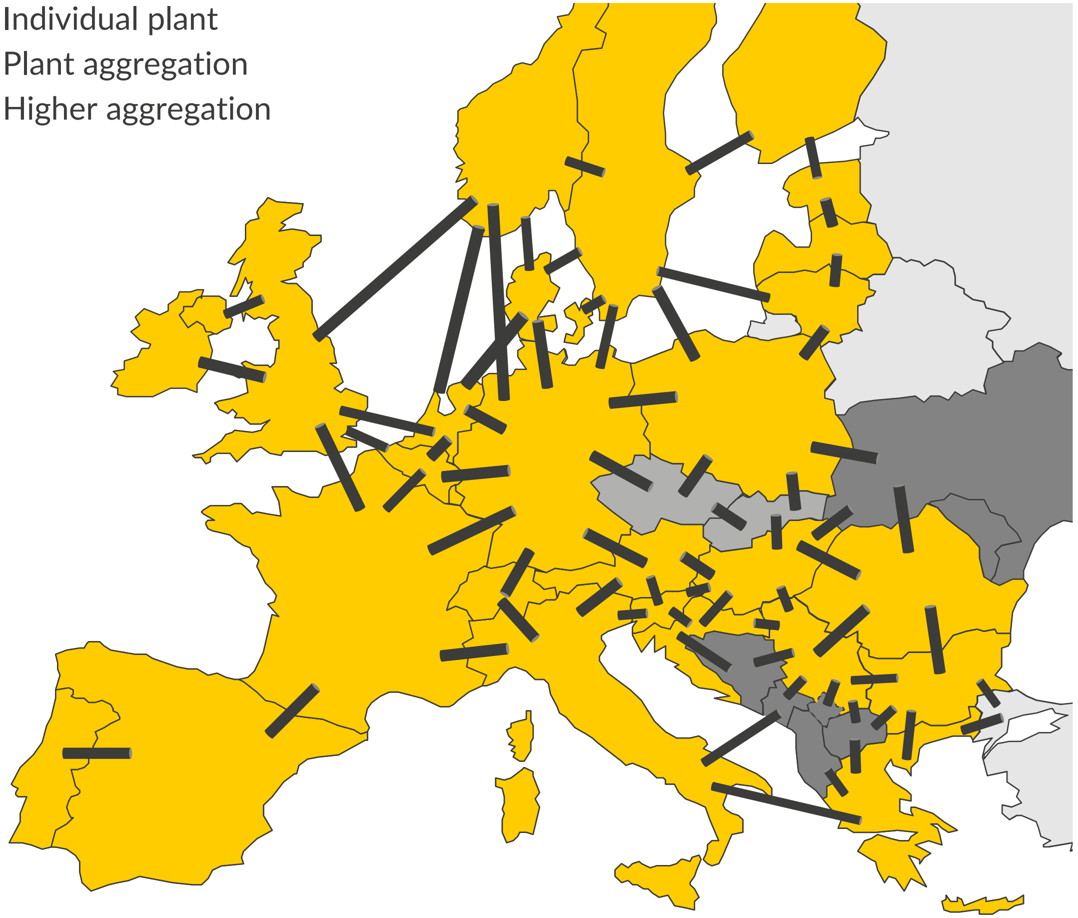
Integration of Aurora's European power market model

Modelling granularity

Individual plant

Plant aggregation

Higher aggregation



Interconnector[1]

1) Sizes and lengths of interconnectors are for visual representation only, illustrative and are not to scale.

Source: Aurora Energy Research

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Under the EU Green Deal, the Renewable Energy Directive, ‘Fit-for-55’ and REPowerEU shape the European policy landscape

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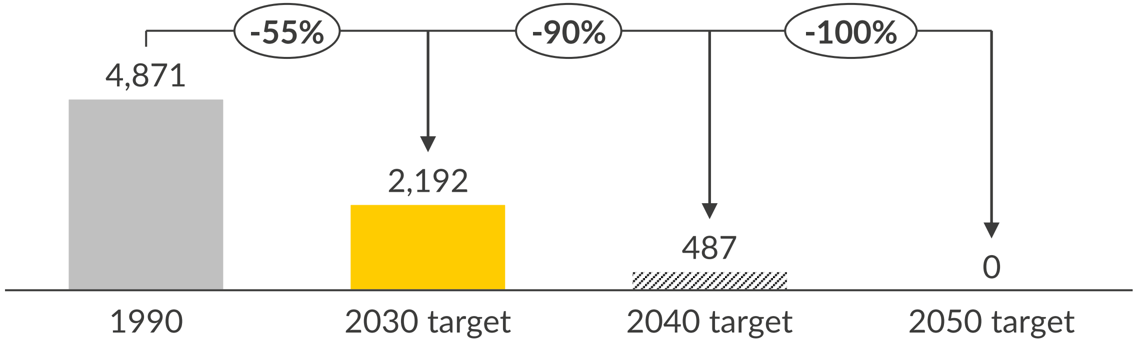
The EU targets aim to reduce emissions by 55% by 2030 relative to 1990 levels, and reach net zero by 2050

Total net[1] greenhouse gas emissions of the EU-27

$MtCO_2e$



These targets are formulated in the European Green Deal, the Commission's flagship set of policy initiatives to achieve the green transition.

Three landmark initiatives set out the measures introduced for this purpose:

- The **Renewable Energy Directive**, signed into law in 2018 and since updated, forms the overarching legal framework for renewables buildout.
- The “**Fit for 55**” package, published in July 2021, includes several legislative proposals to obtain the 55% target[2].
- The “**REPowerEU**” strategy, first announced in March 2022, came in response to the Russian invasion of Ukraine and introduced higher renewables targets.

Renewable Energies Directive (RED)

In June 2023, an updated renewable energy target was agreed

- 42.5% of European final energy consumption should come from renewables by 2030, whilst ‘aiming for 45%’ (up from 32% previously)

“Fit for 55” package

On 25 April 2023, after a final vote of the Council, key measures were adopted:

- Aim for 62% emissions reduction in the sectors covered by the ETS (vs 2005)
- Tightening EU ETS to include maritime and aviation emissions
- Introduction of the Carbon Border Adjustment Mechanism[3] (CBAM)

Ongoing: Member States update their national climate and energy policies

“RePowerEU” strategy

In March 2023, the Council adopted RePowerEU, which built on “Fit for 55”:

- Ensure energy security by introducing mandatory strategic gas reserves
- Reduce the EU’s dependence on Russian gas by improving energy efficiency, and speeding up the buildout of renewables and hydrogen
- Measures are funded via repurposed COVID-19 funds, EU-ETS auctions, a Brexit reserve and potentially from 2014-2020 European cohesion funds

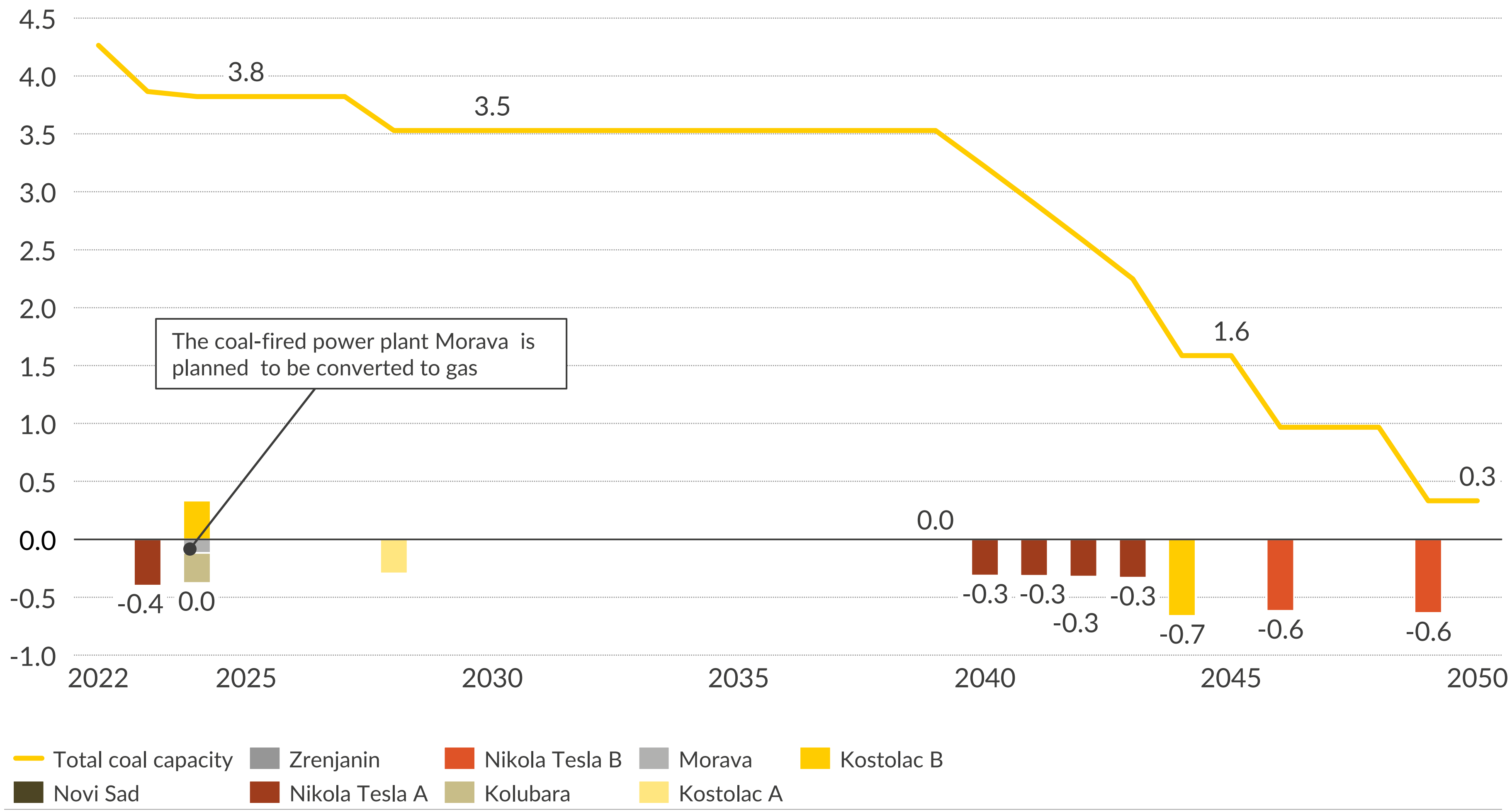
Ongoing: Members adjust their recovery and resilience plans to make use of the repurposed COVID funds allocated to finance REPowerEU

1) A net target allows for the accounting of emission savings from natural carbon sinks, e.g., forests. The 55% net target translates into a ~53% gross target. 2) The EU Climate Law, published in tandem with "FF55" and adopted in May 2021, stipulates a 55% reduction in GHG emissions by 2030 (previous: 40%) and net zero by 2050 (previous: 80-95%). 3) Represents tariff importers need to pay based on the carbon intensity of imported goods.

Sources: Aurora Energy Research, European Commission, European Environment Agency

Even though Serbia's installed coal capacity is decreasing, the country does not foresee a coal exit before 2050

Installed coal capacity
GW



Sources: Aurora Energy Research, NECP, Eurostat

Comments

- The Serbian government does not foresee a coal exit before 2050
- The installed coal capacity is expected to halve by the early 2040s and then rapidly decline by 2050
- A new coal-fired unit of the Kostolac power plant is coming online in 2024; several units are being revitalised in the upcoming years
- Serbia will shut-down three coal-fired power plants by 2025 including one unit of the Nikola Tesla plant in 2024, as they are not in line with the ecological requirements of the European Union's Large Combustion Directive

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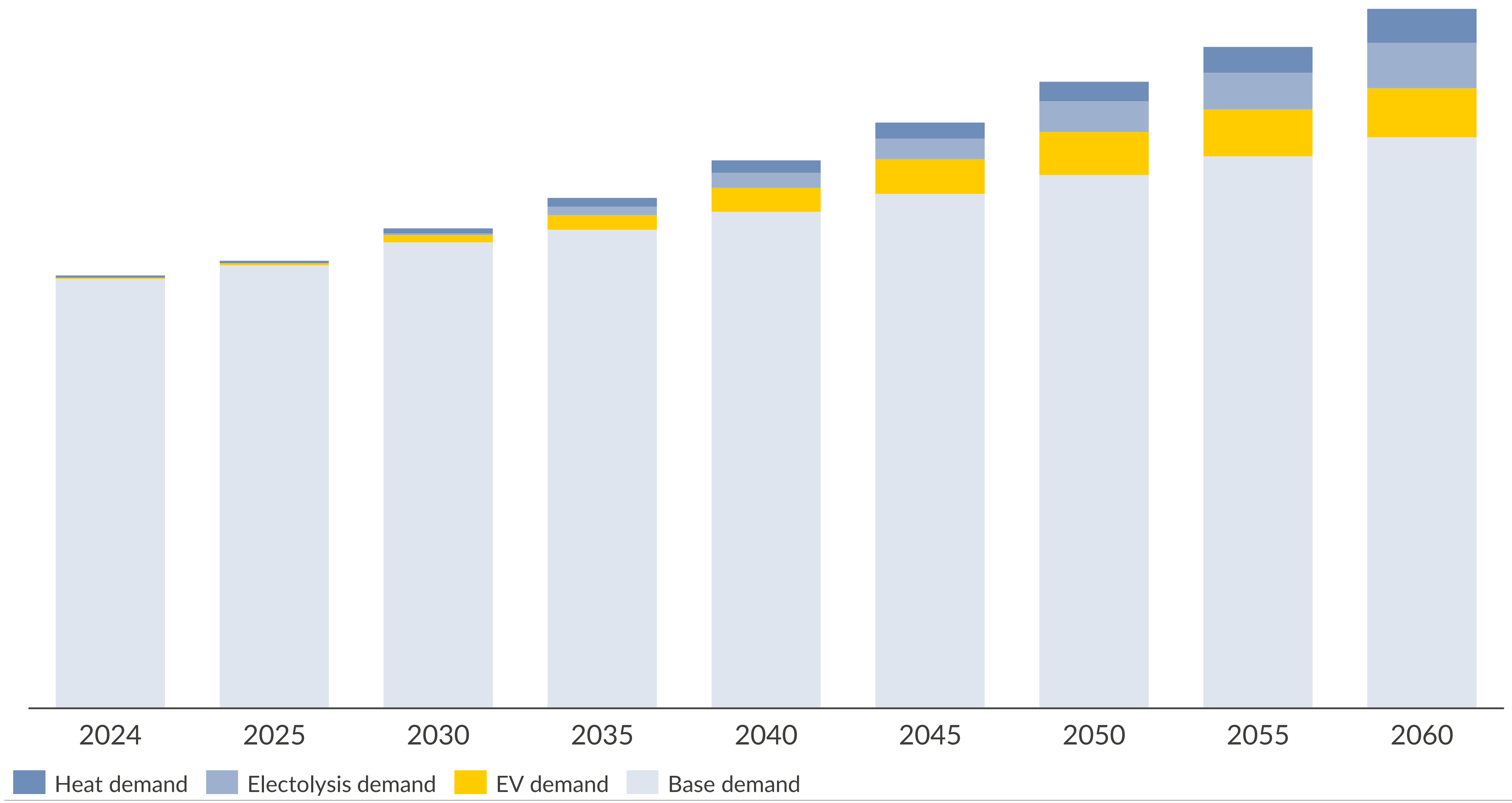
The electrification of transport, heating, and from 2030 onwards H2 electrolysers increase Serbia's electricity demand

Evolution of Demand
TWh



- Base demand will continue growing due to GDP growth
- However, the **electrification of additional end-use sectors**, including transportation and heat will create additional demand, especially from 2035 onwards
- Additionally, the gradual substitution of GAS CCGTs by hydrogen powered turbines will create the respective **electrolysis demand**, which will increase substantially from 2040 onwards

Source: Aurora Energy Research

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LNG remained the largest source of European supply, accounting for 36% in Dec-23, despite a 6% y-o-y drop in total supply

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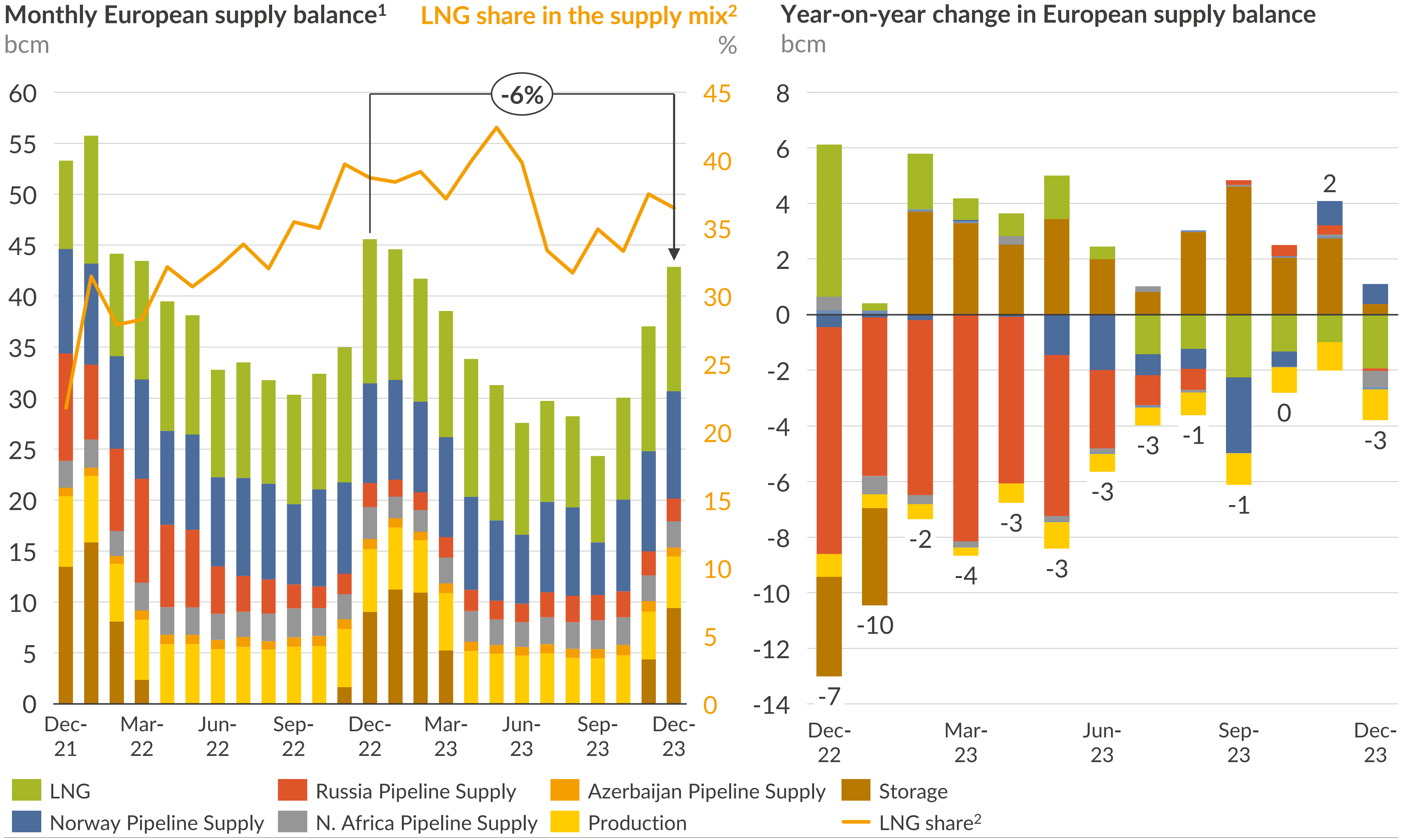

1) Europe includes EU-27 and the UK. Storage injections are not included. 2) LNG share does not include storage withdrawals/injections in the supply mix.

Sources: Aurora Energy Research, Refinitiv, GIE, GB National Gas

- **In Dec-23, Europe's gas supply fell** to 42.9bcm, a 2.7bcm (-6%) decrease from Sep-22, primarily due to **mild winter weather and low demand from industry**
- **LNG's share of the supply mix accounted for 36% in Dec-23**, 2pp lower than in Dec-22 and far from a peak of 42% in May-23. LNG imports declined by 1.9bcm in Dec-23 (-14% y-o-y), as storage levels remained above average
- **In Sep-23, Russian pipeline gas imports represented 5% of Europe's total supply**, unchanged from Dec-22, as only two import routes remained available
- **The share of pipeline supply in Europe remained stable y-o-y at 50% in Dec-23**, with Norway taking a 25% share of total supply in Dec-23 vs 21% in Dec-22

Starting in 2030, rising global demand for gas pushes prices higher

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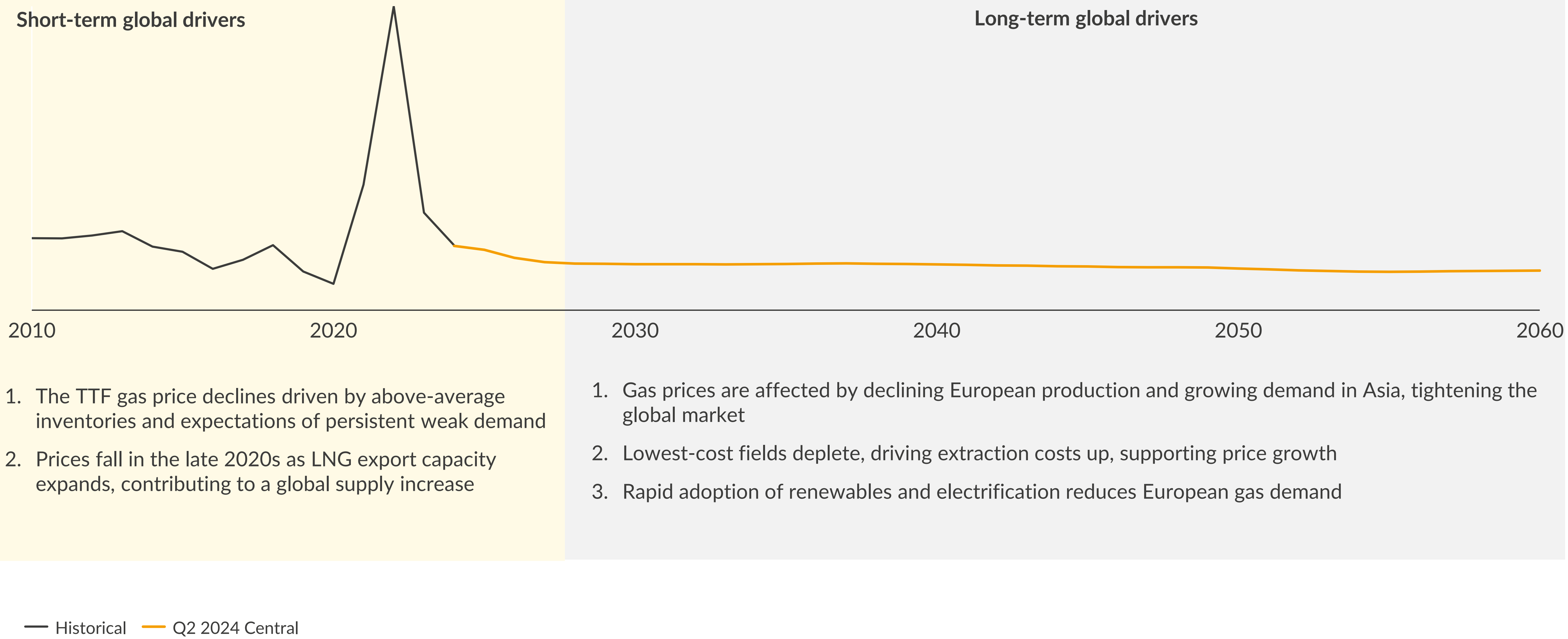
SRB Gas prices
€/MWh (real 2023)



Short-term global drivers

1. The TTF gas price declines driven by above-average inventories and expectations of persistent weak demand
2. Prices fall in the late 2020s as LNG export capacity expands, contributing to a global supply increase

Long-term global drivers

1. Gas prices are affected by declining European production and growing demand in Asia, tightening the global market
2. Lowest-cost fields deplete, driving extraction costs up, supporting price growth
3. Rapid adoption of renewables and electrification reduces European gas demand

Source: Aurora Energy Research

EU ETS prices climb as emissions reduction targets grow more stringent

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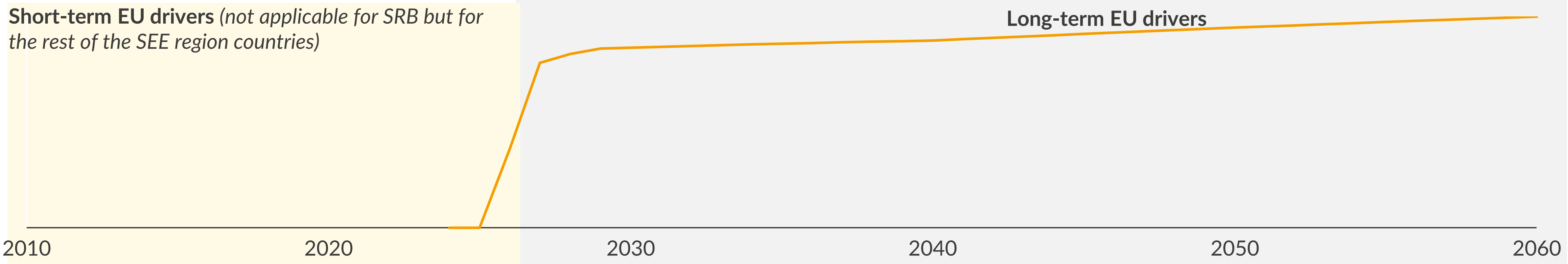
SRB Carbon prices
€/tCO_2 (real 2023)



EU carbon prices, i.e., monthly average of daily EU ETS front-year prices, dropped significantly reaching an average of 57.6 €/tCO_2 in Feb-24, down from 85.6 €/tCO_2 in Oct-23

1. Price decreases have been driven by lower power sector demand due to low gas prices, while weak economic output and increased interest rates have reduced industrial demand
2. In addition, higher supply from frontloading of certificates in light of RePowerEU and high short positions from speculative traders have pushed prices lower

Long-term prices increase steadily across the forecast:

- reflecting the recovery of economic output for most sectors by the end of this decade
- maintaining policy ambitions (including approaching the levels required for fuel switching to green hydrogen)

Q2 2024 Central

Source: Aurora Energy Research

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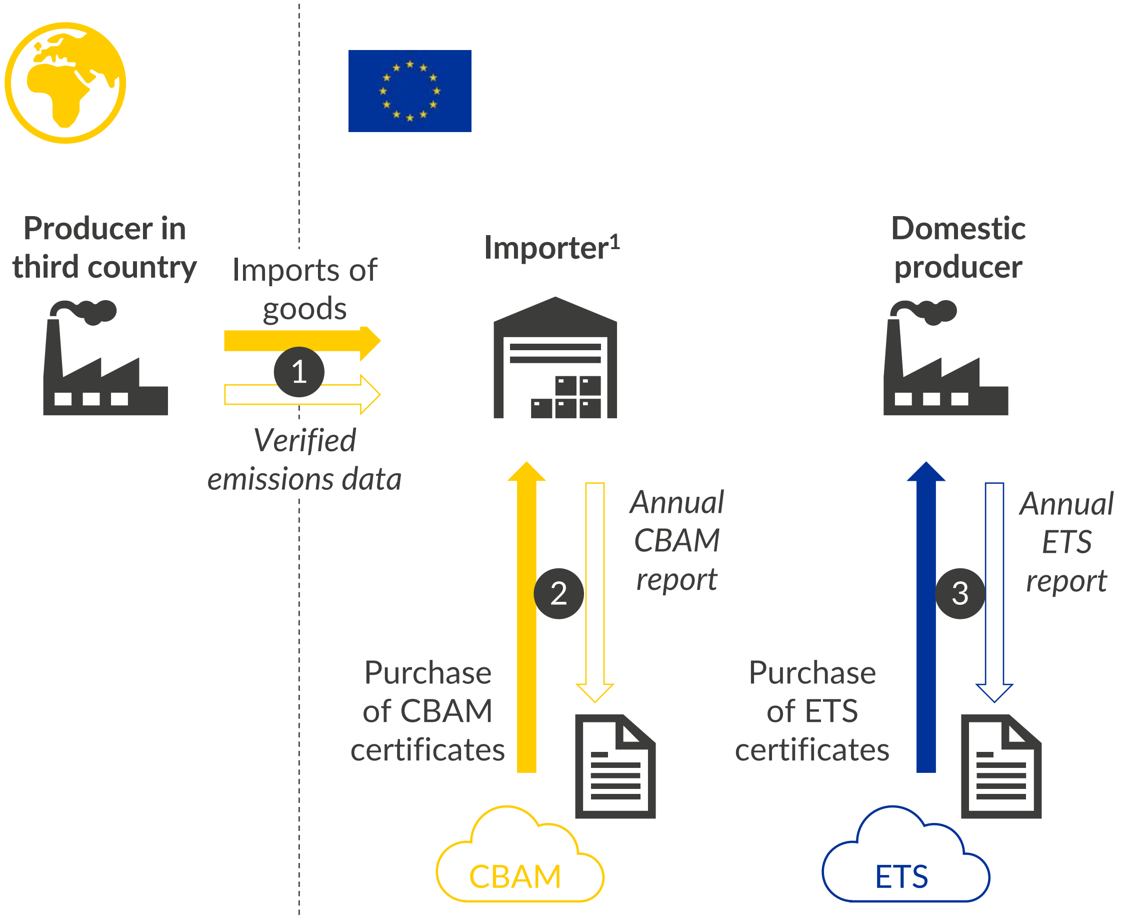
From 2026 onwards, the importer is responsible for buying CBAM certificates for imported emissions

How does CBAM work?



1. A producer of goods falling under the CBAM regulation ships products to an importer in the EU
   - With the goods, the producer provides information for the verified emissions report that is used for the CBAM declaration including the CO_2 price applied in the country of origin
2. The importer needs to be an authorised CBAM declarant for importing CBAM goods and is the liable party under CBAM
   - The importer is responsible for paying the **CBAM price**, which is based on the **average EUA auction prices from the previous week,** for the carbon content of the imported goods
   - The importer provides an annual CBAM report including the following information (Article 6):
     - Total quantity of each type of goods imported
     - Total embedded emissions per unit of good
     - Total number of CBAM certificates surrendered, taking carbon price in country of origin into account
3. Domestic producers currently falling under the ETS, will remain under the ETS
   - Free allowances to CBAM sectors will be gradually phased out

1) The declarant can also be an indirect customs representative, if the importer is established outside the EU or when an indirect customs representative has agreed to reporting obligations

Sources: Aurora Energy Research, DEHSt

For goods apart from electricity, reported emissions should correspond to actual emissions as the default

Goods covered by CBAM

- CBAM will initially be introduced for goods with
  - High risk of carbon leakage and
  - High emission intensity
- These goods are

1
- Iron and Steel including products e.g. tubes, pipes and other materials
- Aluminium, including products e.g. wires, tubes, pipes and other materials
- Hydrogen

2
- Cement
- Fertilisers

3
- Electricity

- Once fully phased in, these will cover 50% emissions under the ETS 1
- CBAM will be applied to direct emissions in the production process and for cement and fertilisers also cover indirect emissions
- By the end of the transitional period, the European Commission will evaluate the inclusion of further products falling under the ETS 1 as well as the inclusion of indirect emissions for other product groups and a potential implementation until 2030

Determination of emissions

Simple goods

- Specific embedded emissions are calculated as the attributed emissions per quantity of good produced
- The attributed emissions consist of:
  - **Direct emissions** for 1 an 2 and **indirect emissions** f 2

Complex goods

- For complex goods both the attributed emissions as well as **emissions of the input materials** are considered
- In case actual emissions cannot be adequately determined, emissions will be based on default values
  - These default values will be based on the average emission intensity of an exporting country for the type of good

Electricity 3

- Embedded emissions for electricity will be **determined based on default values**[1] for emission factors in third countries, based on the best data available to the European Commission
  - In case of missing data, the EU emission factor should be used for reference

1) Under particular circumstances, the declarant may also calculate the emissions based on actual emissions. This applies e.g. in the case of a Power Purchase Agreement, in case the power plant is directly connected to the EU grid, firmly nominated by the TSOs, or emits less than 550 gCO_2/kWh (Annex IV, CBAM)

Sources: Aurora Energy Research, European Commission

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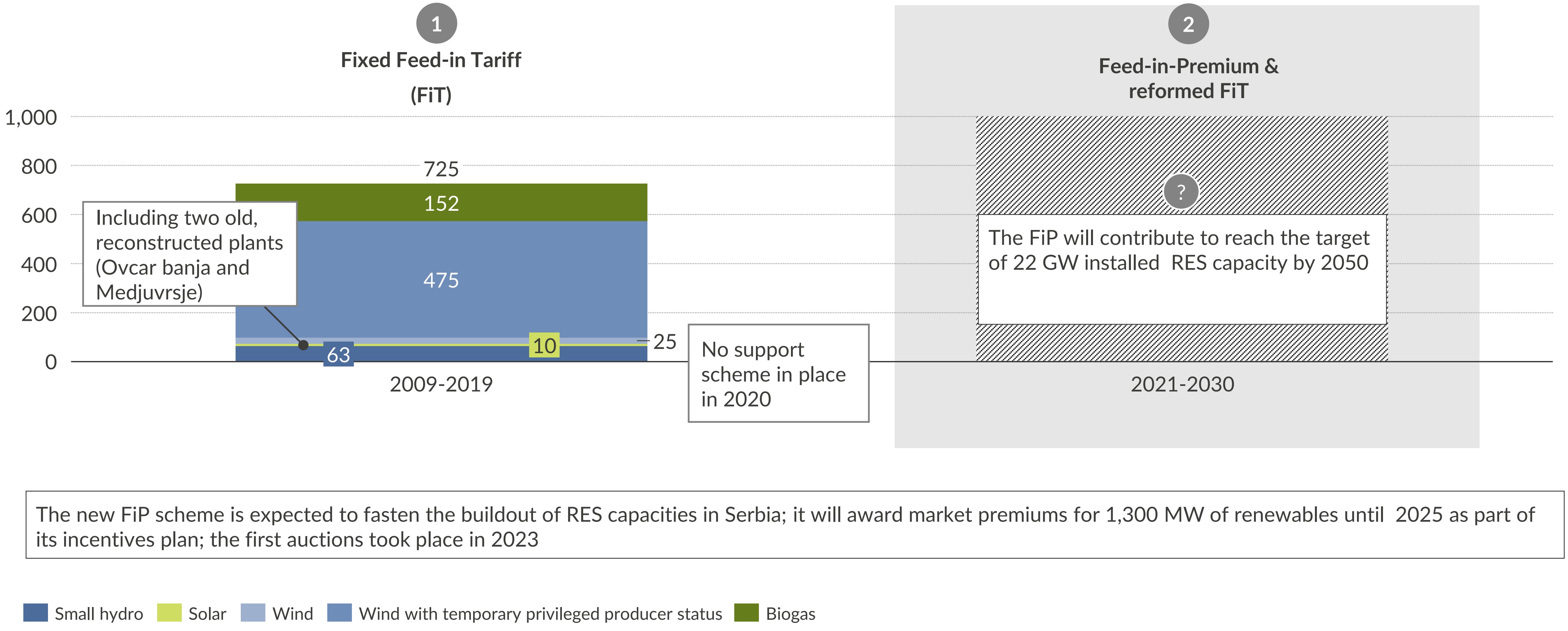
Serbia saw a slow growth of RES capacity; the government expects sharper increase through the new FiP scheme

Accumulated wind and solar installed capacity
GW



The new FiP scheme is expected to fasten the buildout of RES capacities in Serbia; it will award market premiums for 1,300 MW of renewables until 2025 as part of its incentives plan; the first auctions took place in 2023

Sources: Aurora Energy Research, Ministry of Mining and Energy, Balkan Green Energy News

Serbia plans to award market premiums for 1,300 MW of renewables in the next three years

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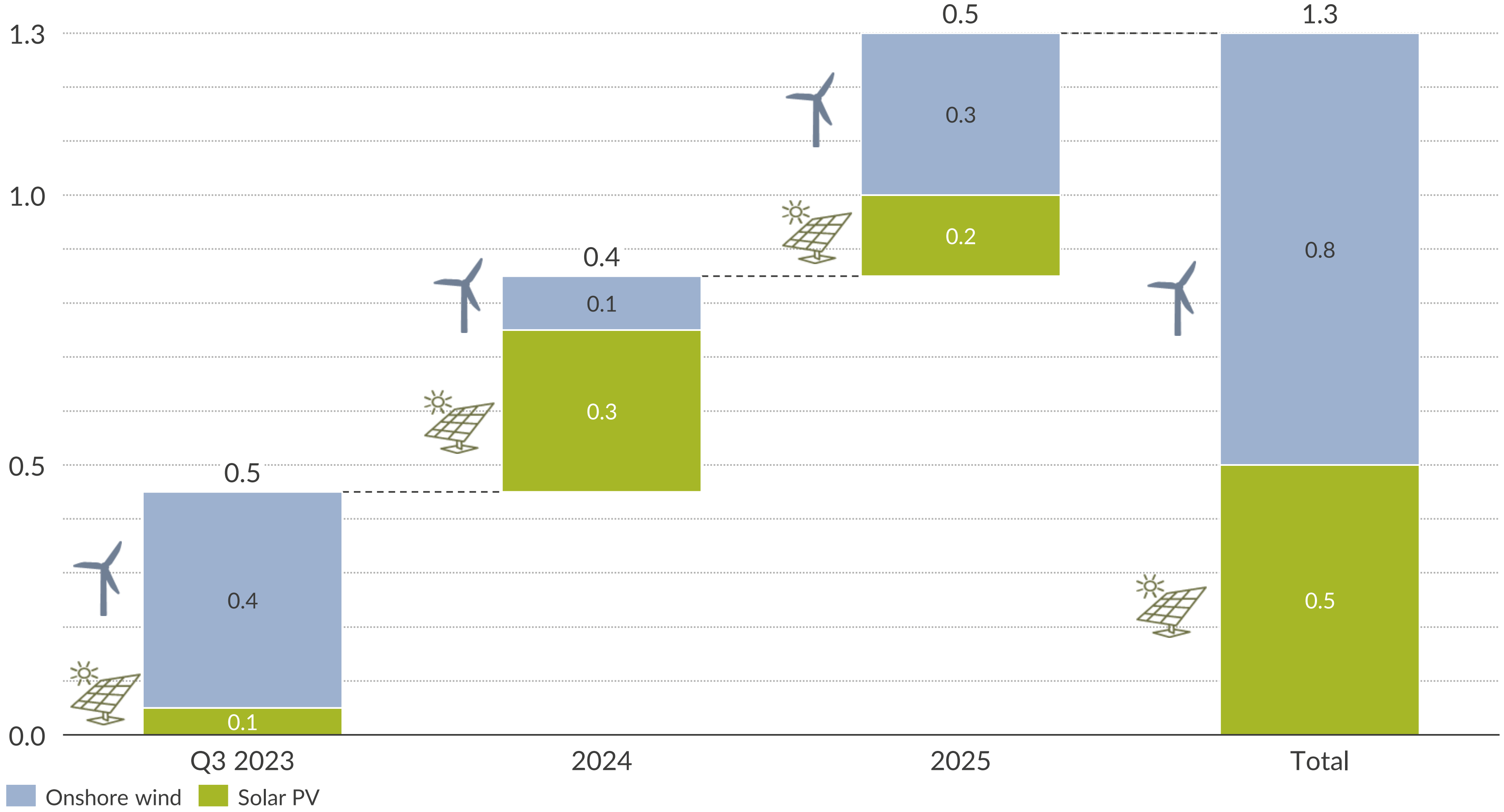
Potential solar PV and onshore wind capacities eligible for the CfD auctions
GW

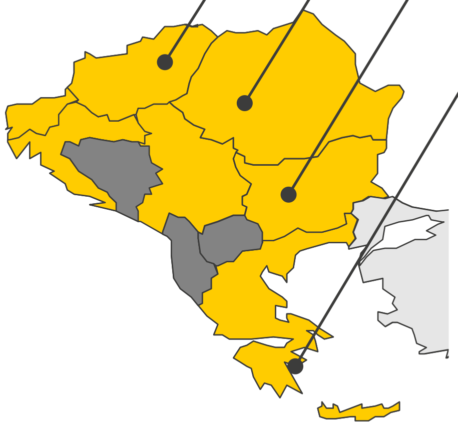


Source: Aurora Energy Research

- The new FiP scheme is expected to fasten the buildout of RES capacities in Serbia, and contribute to reach the target of 22 GW installed RES capacity by 2050
- 100 MW wind capacity and 300 MW in solar is planned for 2024; 200 MW solar and 300 MW wind is planned for the third round in 2025.
- The **duration of the CfD contract is set for 15 years**
- The reference price for calculating the premium is the price of electricity on Serbian power exchange market SEEPEX

Tenders for renewables and storage facilities are gaining momentum in the region

Apart from Serbia's auctions, other SEE countries are also launching tenders to provide operational support to RES, BESS and collocated projects



HUN:
- The first BESS CfD auction will take place in 2024 and together with an additional CAPEX support scheme – aims to encourage the development of 885 MWh new electricity storage capacities by the end of 2026

ROU:
1 GW each of solar and onshore wind are to be funded via CfD auctions this year, with another 1.5 GW each scheduled for H1 of 2025

BGR:
In March 2024, two tenders were launched to procure 1,425 MW of renewable capacity with 350 MW of energy storage

GRC:
- Two BESS auctions took place in late 2023 and early 2024, one more will take place within 2024
- RES auction is ongoing to offer operating support to RES projects in Bulgaria and Italy
- Two actions schemes are being prepared: 1 RES only and 1 for RES and storage colocation

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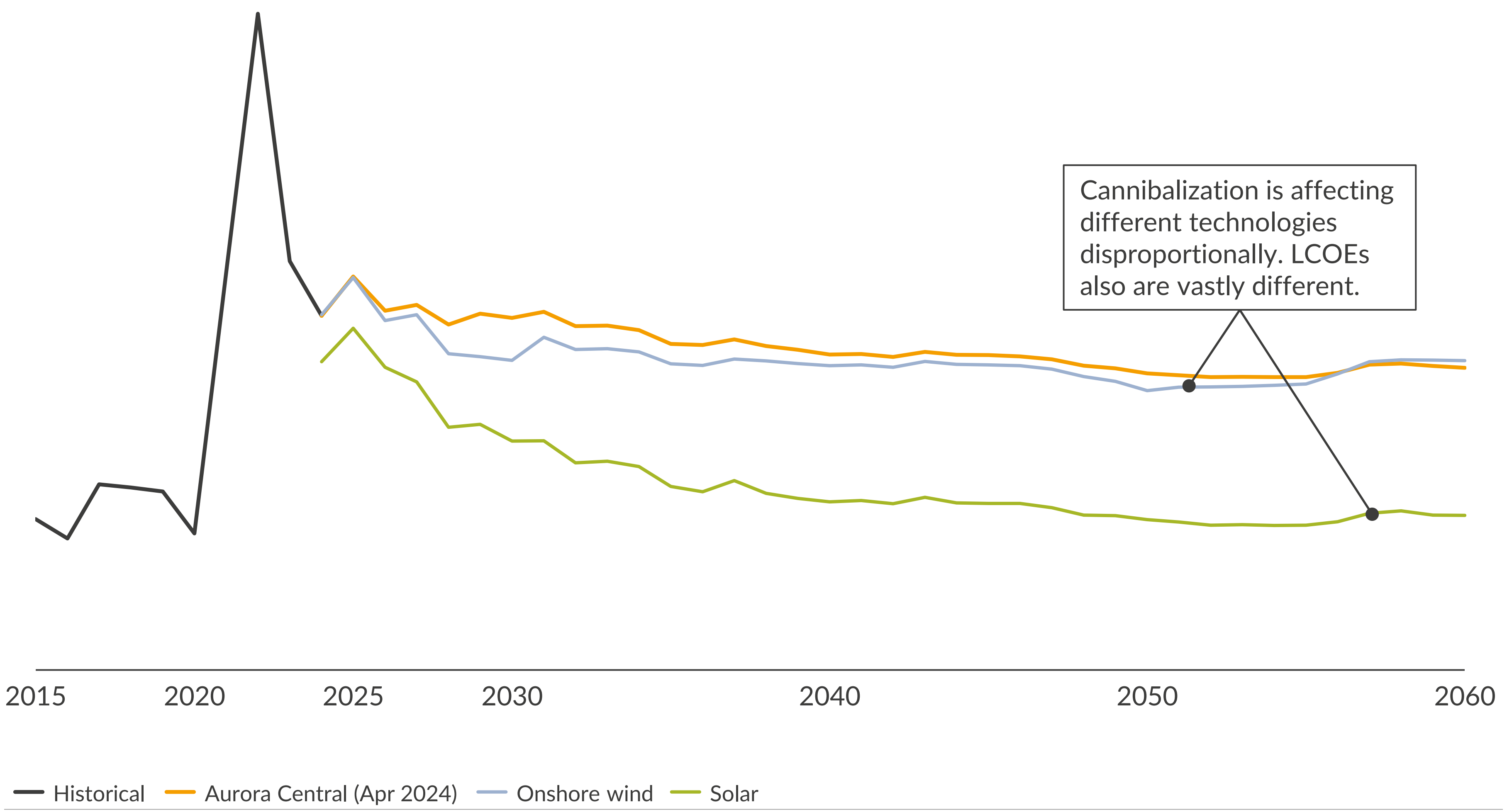
Serbia sees a significant buildout of renewables which results in price cannibalization especially for solar

Baseload and uncurtailed capture prices

€/MWh (real 2023)



Source: Aurora Energy Research

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Baseload prices

- Baseload price decrease as the pressure on gas prices is expected to be eased, especially after 2025 with the addition of a new LNG terminal in the region
- Baseload price plateaus after 2050, due to the rise in low carbon generation mitigating the upwards pressure from higher commodity prices

Onshore wind

- Onshore wind capture prices are driven by the technology's LCOE and penetration of renewables

Solar

- Post 2040, cannibalisation locally and in neighboring markets pushes down solar capture prices

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While CfDs drive the initial RES growth in SEE, many projects are increasingly diverting towards market exposure for higher returns

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A RES subsidy schemes	B Merchant revenues	C Power Purchase Agreement (PPA)
▪ CfD and FiT support schemes which provide a fixed price for 20/25 years ▪ In the last decade, RES support schemes have been the main route to market in SEE for solar and wind plants	▪ Full market exposure where RES plants participate in the wholesale market and depend fully on market conditions ▪ Merchant returns particularly attractive in the short-term given the high-price environment	▪ Bilateral agreements for the delivery of power offering price and volume certainty ▪ PPAs provide a fixed market-based alternative to subsidies and fully merchant assets
Financing/Risk	**Financing/Risk**	**Financing/Risk**
– Over 7 GW of projects have been financed over the past decade from FiT and CfDs	– Greek banks have not yet financed a fully merchant project	– Greek banks consider financing PPA backed assets even with partial merchant exposure
Difficulty entering the market	**Difficulty entering the market**	**Difficulty entering the market**
– Projects get grid connection however there is a strong competition in the auctions and licensing	– Not in grid connection priority lists – Such projects need trading desks or aggregators	– Apart from licensing and grid connection, the suitable off-taker needs to be identified
Potential revenues	**Potential revenues**	**Potential revenues**
– The competitive auctions result in low strike prices and therefore lower absolute revenues	– Given our forecast, merchant assets could earn revenues resulting in double digits IRRs	– PPA revenues are forecasted to be between the subsidised and merchant equivalents

Source: Aurora Energy Research

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