



RYSTAD ENERGY

THE FUTURE OF EUROPEAN POWER AND ITS IMPACT ON GAS DEMAND

EUROPEAN GAS DIALOGUES

CARLOS TORRES-DIAZ, HEAD OF GAS AND POWER MARKETS

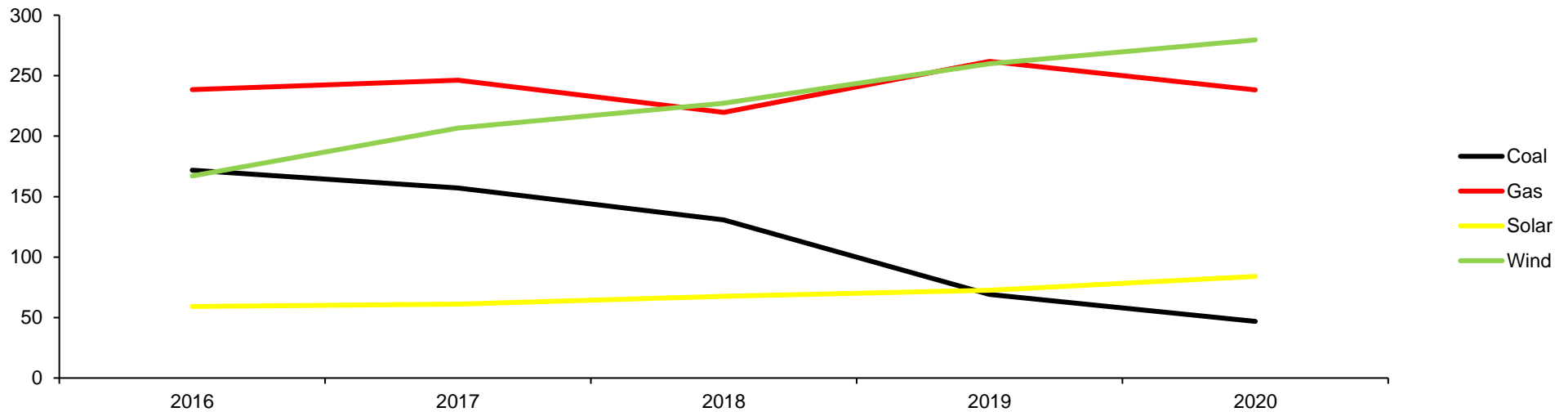
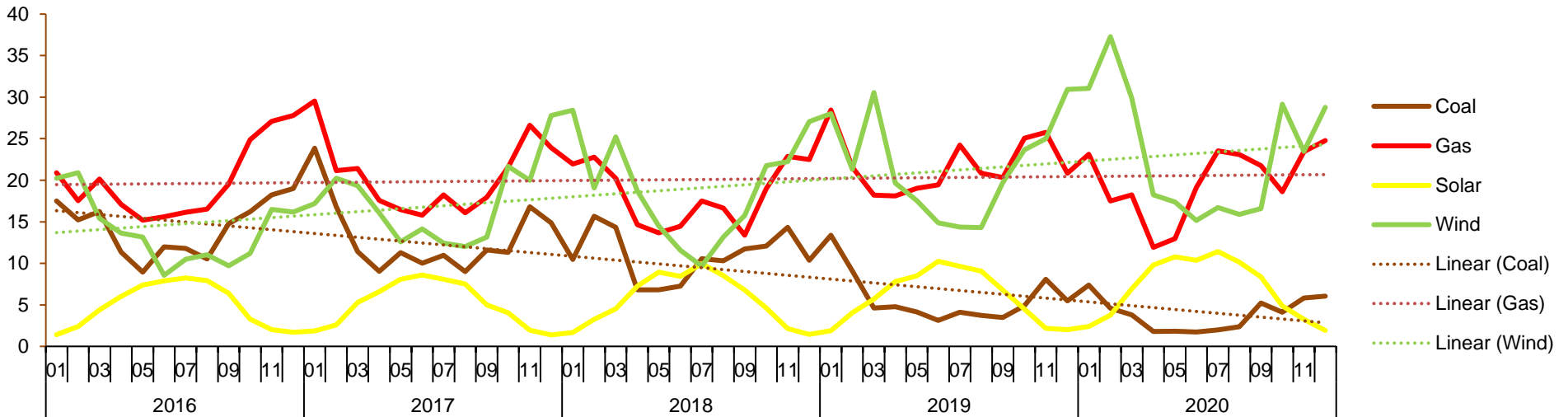
MARCH 3, 2021

Content

- European power generation outlook
 - Recent developments in power generation
 - Future power generation mix
- Implications for gas demand and imports
- Challenges for the system

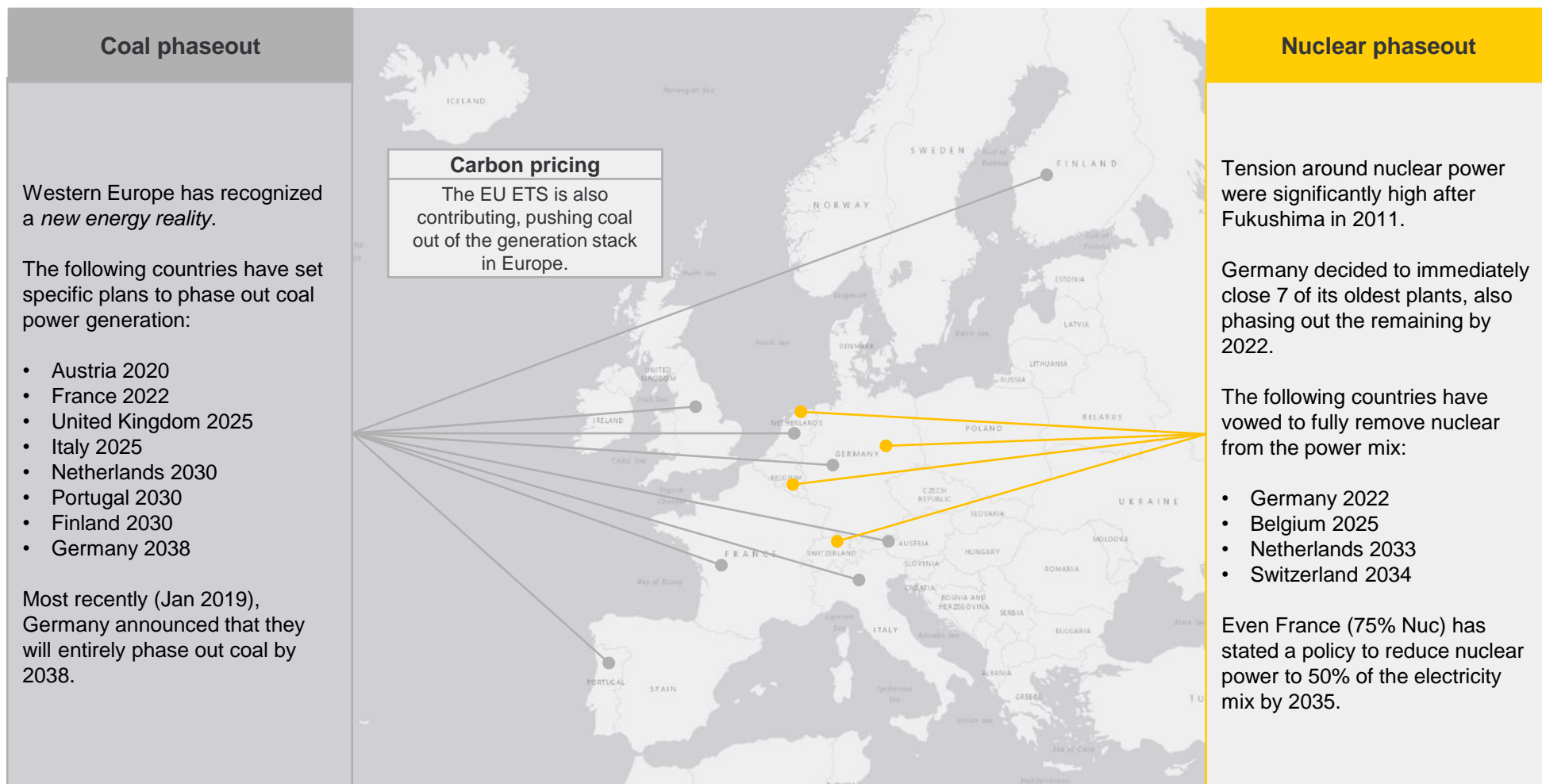
Wind has displaced coal while gas remains strong

Power generation DE, ES, FR, UK
GWh



Source: Rystad Energy research and analysis, Refinitiv, Entsoe

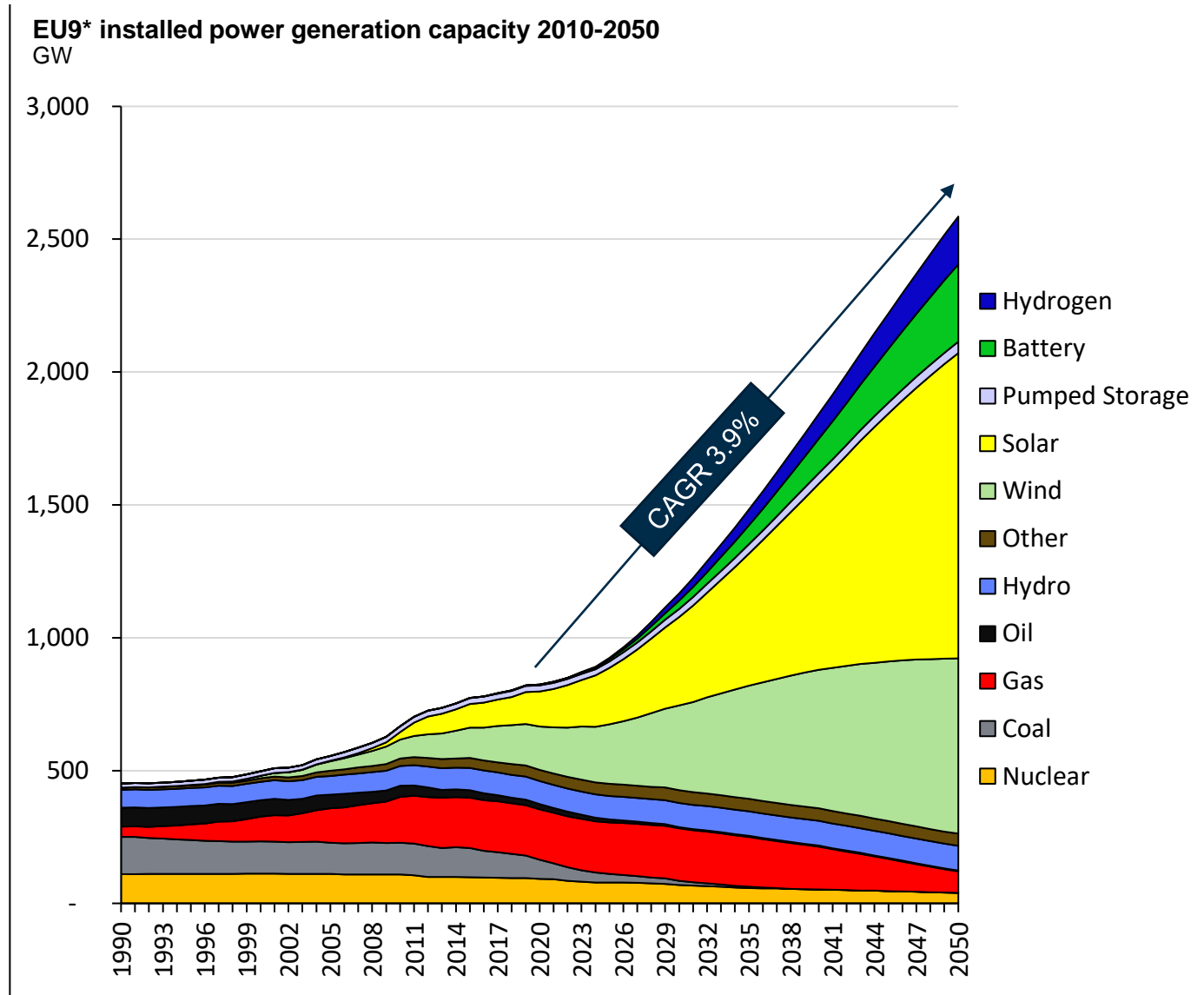
Extensive coal and nuclear phaseouts – increase the need for gas and renewables



Source: Rystad Energy research and analysis; Agora Energiewende; Sandbag; Reuters. *International Nuclear and Radiological Event Scale.

Massive capacity growth needed to decarbonize the power sector

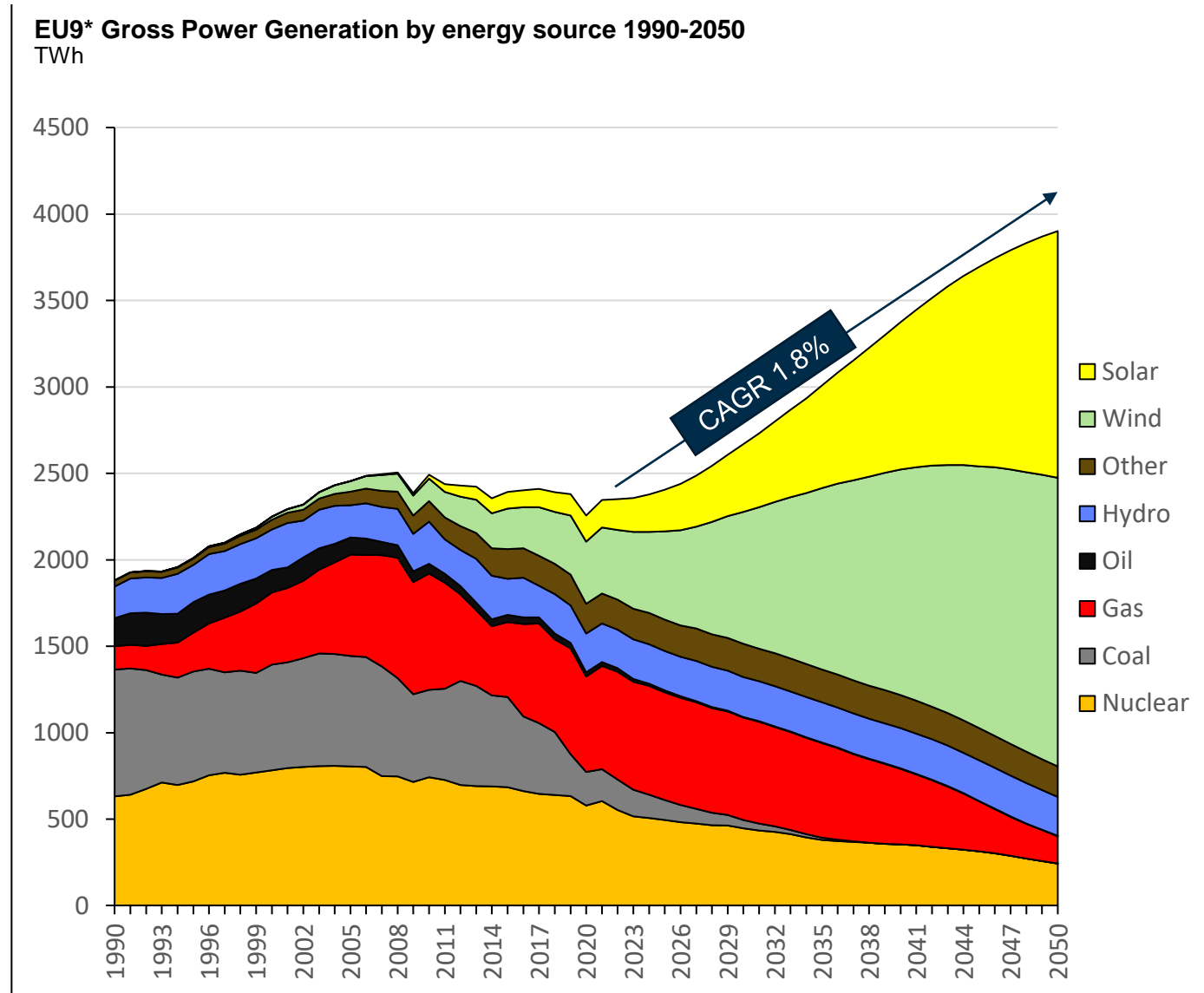
- The current pipeline for renewable projects in EU9 is very strong. **Solar PV and wind will dominate in terms of new capacity additions.**
- Capacity increase for EU9 countries from **824 GW in 2020 to 2585 GW in 2050**, when storage is included.
- **Energy storage to be a key technology** to enable the future renewables dominated European power system
- **Battery storage will be the most important source for peak shaving**
- Hydrogen electrolyzer capacity is expected to reach high levels by 2050, where the hydrogen produced will play an important role for decarbonization of other sectors.



Source: Rystad Energy research and analysis, Rystad Energy RenewableCube, Eurostat, IEA
 * EU9 included the following countries: UK, NL, BE, FR, DE, IT, ES, AU, PT

Strong generation growth needed to meet demand, solar and wind to dominate generation in 2050

- Low capacity factors for wind and solar mean output from these sources is limited
- After a COVID-19 related drop in generation in 2020, overall **generation expected to be relatively stable in the early 2020s**
- **Faster growth expected from late 2020s**
- Declining **coal generation will leave a supply gap** that will be filled mostly by natural gas, solar PV onshore and Offshore wind.
- In the longer-term **gas and nuclear are also see decreasing but could still be needed to meet future demand.**
- **CCS needed to eliminate completely emissions.**

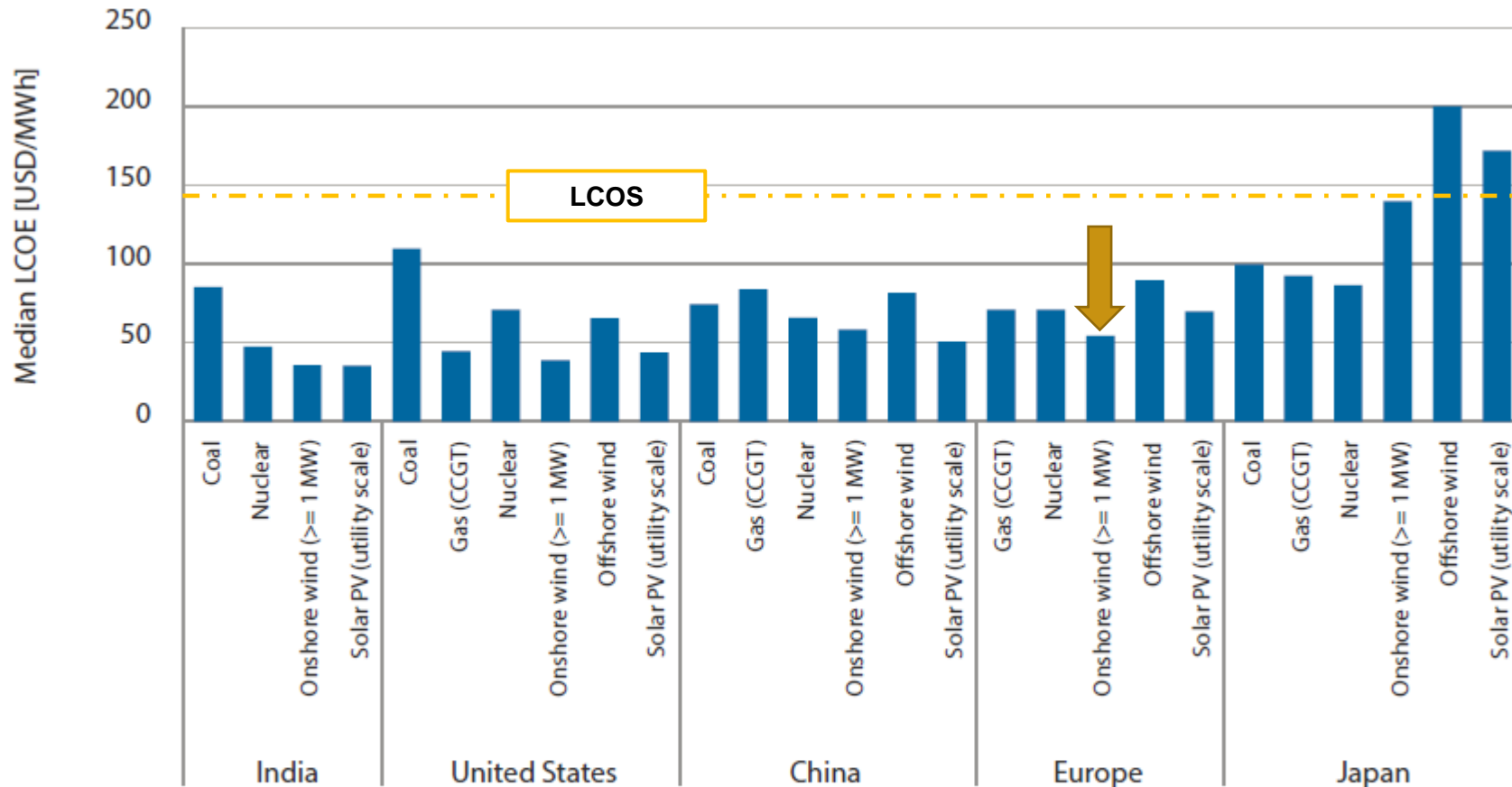


Source: Rystad Energy research and analysis, Rystad Energy RenewableCube, Rystad Energy PowerCube, Eurostat, IEA

*EU9 included the following countries: UK, NL, BE, FR, DE, IT, ES, AU, PT

Onshore wind most competitive technology in Europe

Median technology costs by region
USD/MWh

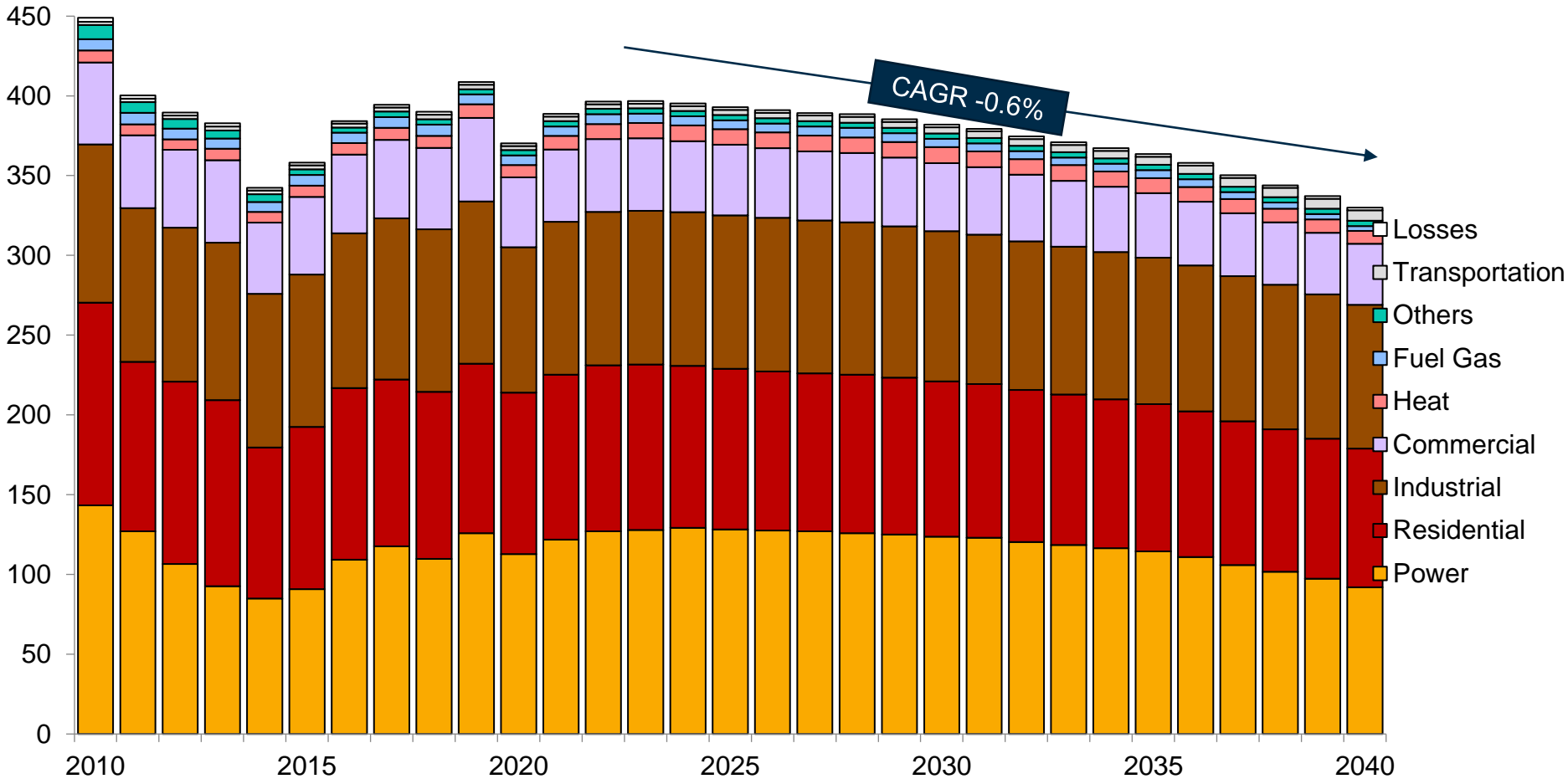


Note: Values at 7% discount rate.

Source: IEA Projected Costs of Generating Electricity 2020

European natural gas demand will start a slow decline in the next couple of years

EU9* natural gas demand by sector
Billion cubic meters

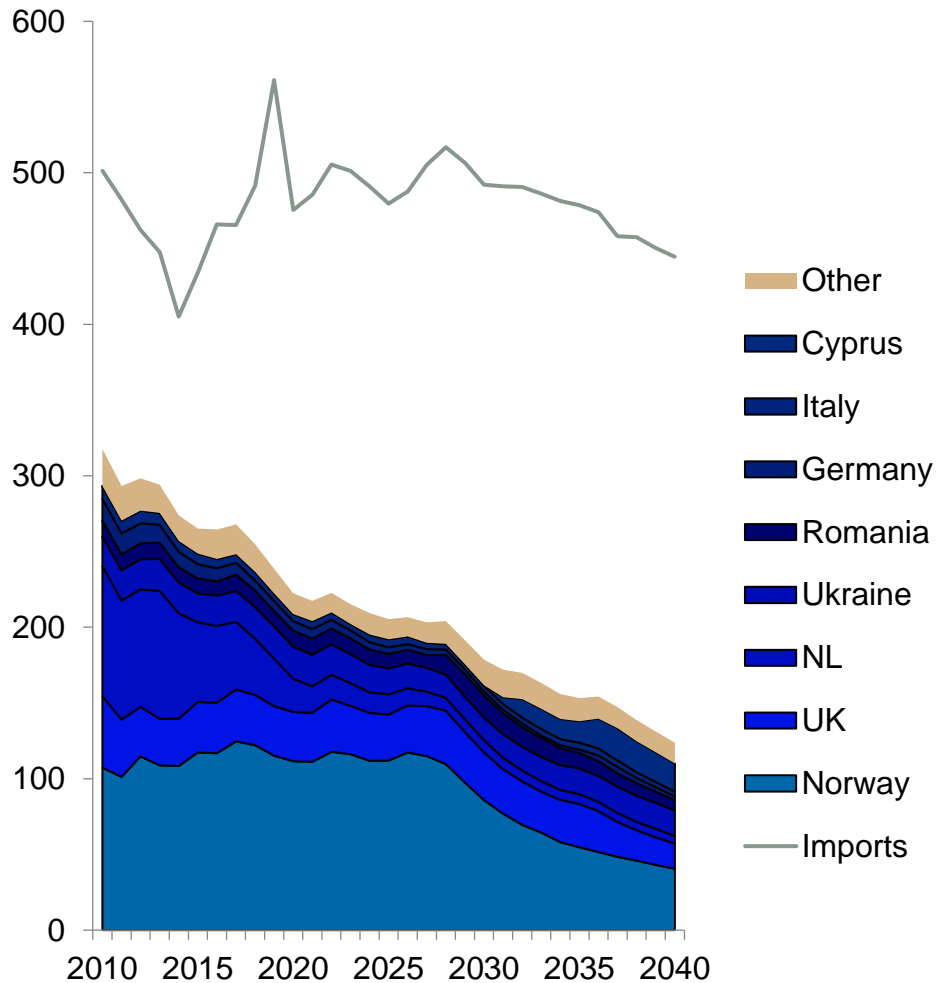


Source: Rystad Energy GasMarketCube
* EU9 included the following countries: UK, NL, BE, FR, DE, IT, ES, AU, PT

Europe will continue to rely on imports to meet its future demand

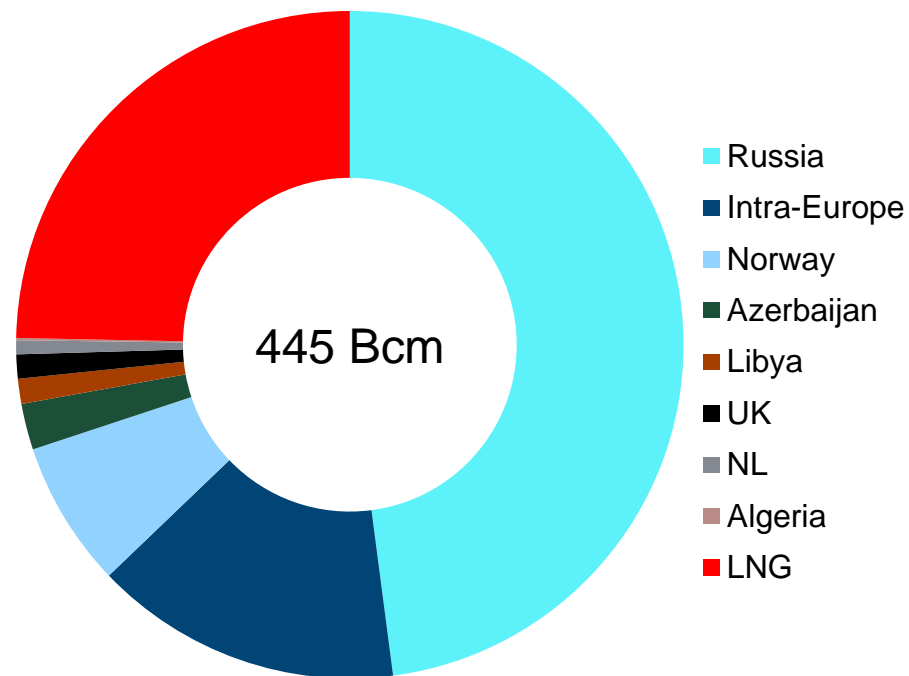
European natural gas production

Billion cubic meters



European natural gas imports 2040

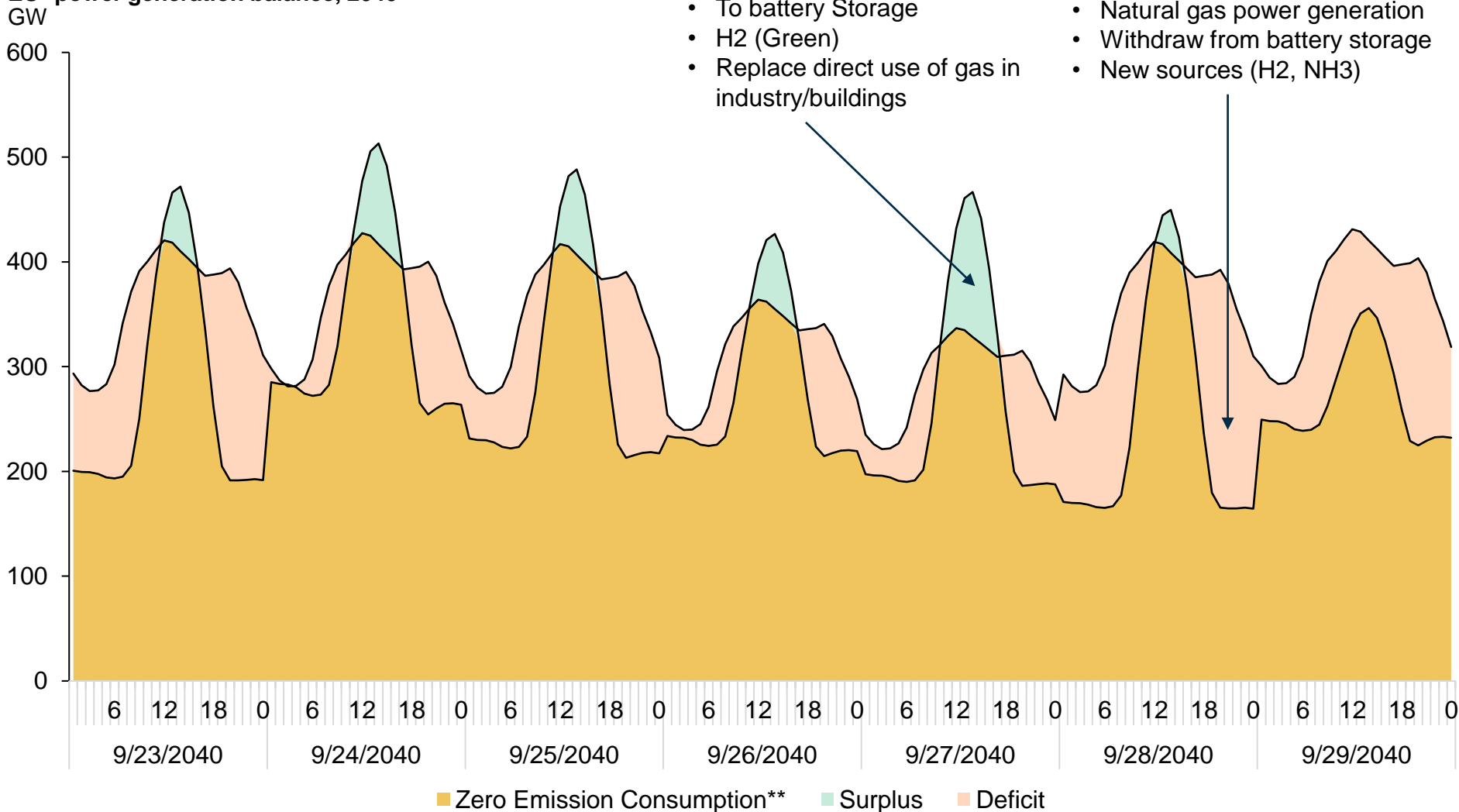
Billion cubic meters



Source: Rystad Energy GasMarketCube

Gas power, batteries and hydrogen needed for peak shaving

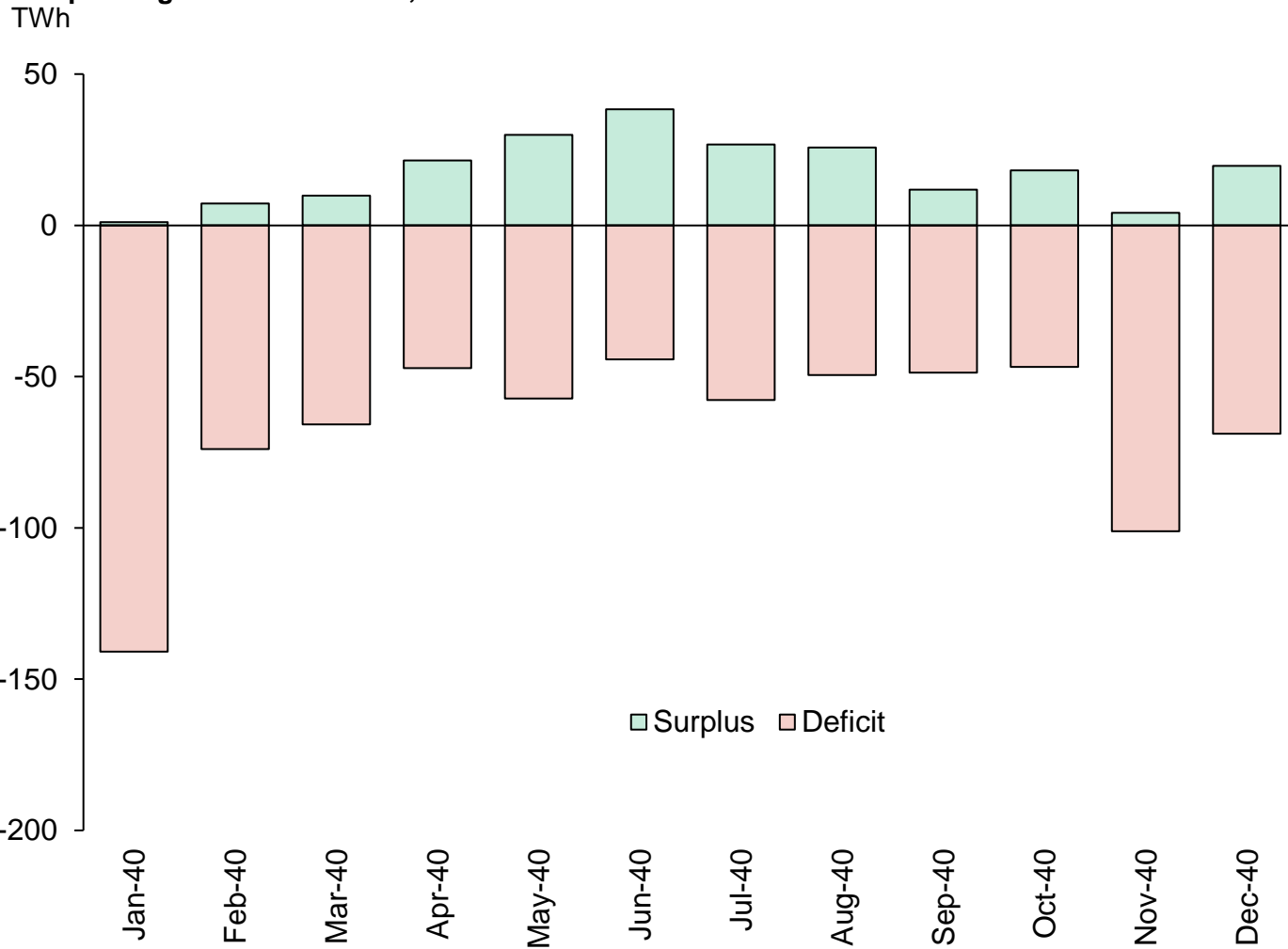
EU* power generation balance, 2040



*) EU27 + UK **) Includes Nuclear power generation
Source: Refinitiv, Rystad Energy Research and Analysis

Net deficit of 580 TWh to be met by gas-fired generation or storage

EU* power generation balance, 2040



Surplus
2040: 215 TWh of surplus potentially replacing gas in buildings and industrial sector
Deficit
2040: 800 TWh of fossil fuel fired generation needed to meet electricity demand

*) EU27 + UK
Source: Refinitiv, Rystad Energy Research and Analysis



RYSTAD ENERGY

Rystad Energy is an independent energy consulting services and business intelligence data firm offering global databases, strategy advisory and research products for energy companies and suppliers, investors, investment banks, organizations, and governments. Rystad Energy's headquarters are located in Oslo, Norway.

Headquarters

Rystad Energy
Fjordalléen 16, 0250 Oslo, Norway

Americas +1 (281)-231-2600

EMEA +47 908 87 700

Asia Pacific +65 690 93 715

Email: support@rystadenergy.com

© Copyright. All rights reserved.

