



Energy prices: perspectives from the recent crisis and the green transition

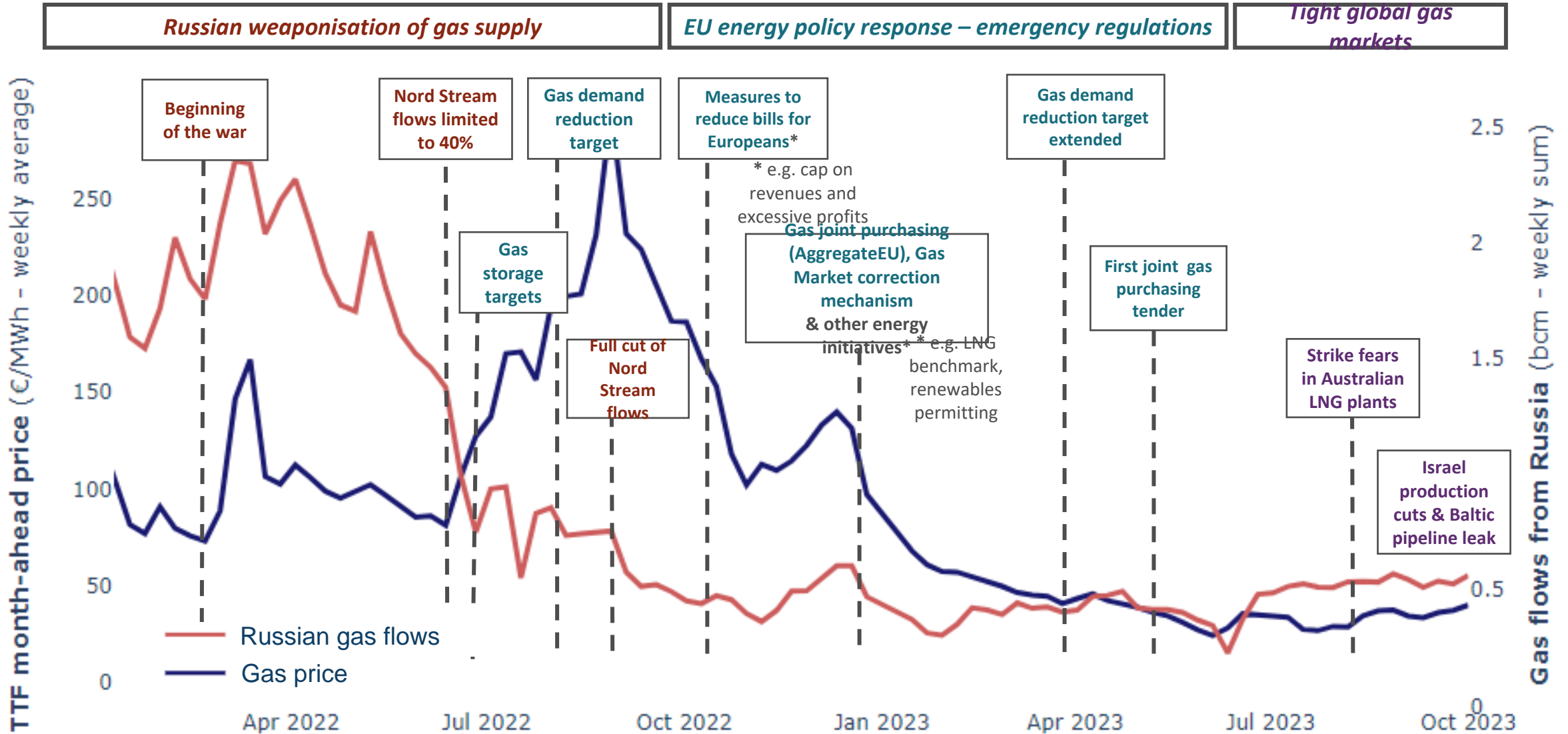
27th Conference of the Forum for Macroeconomics and Macroeconomic Policy

21 October 2023

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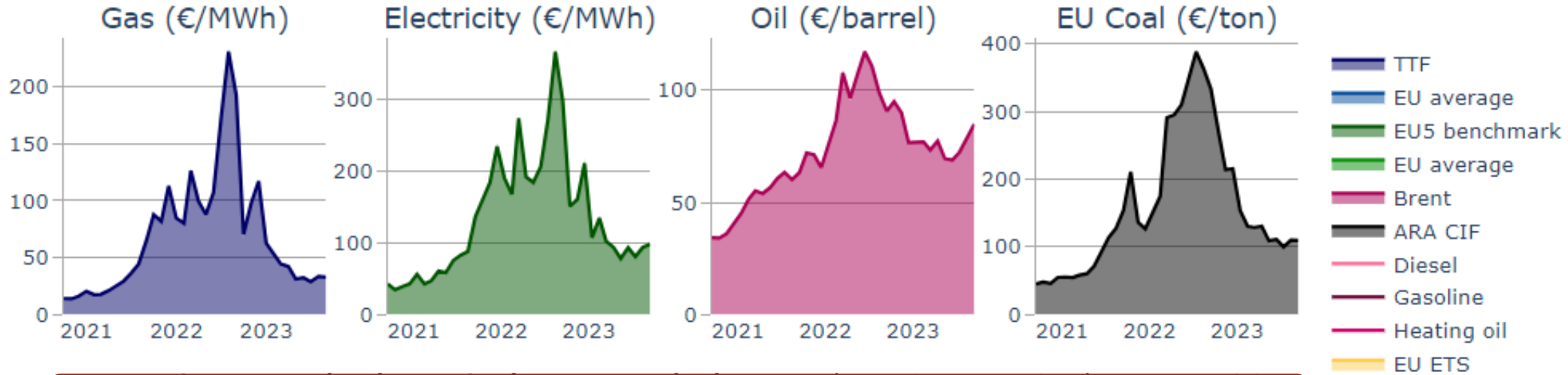
Fundamentals after the crisis – improved situation

2021-2022 energy crisis not related to the green transition: a (Russian) natural gas crisis...

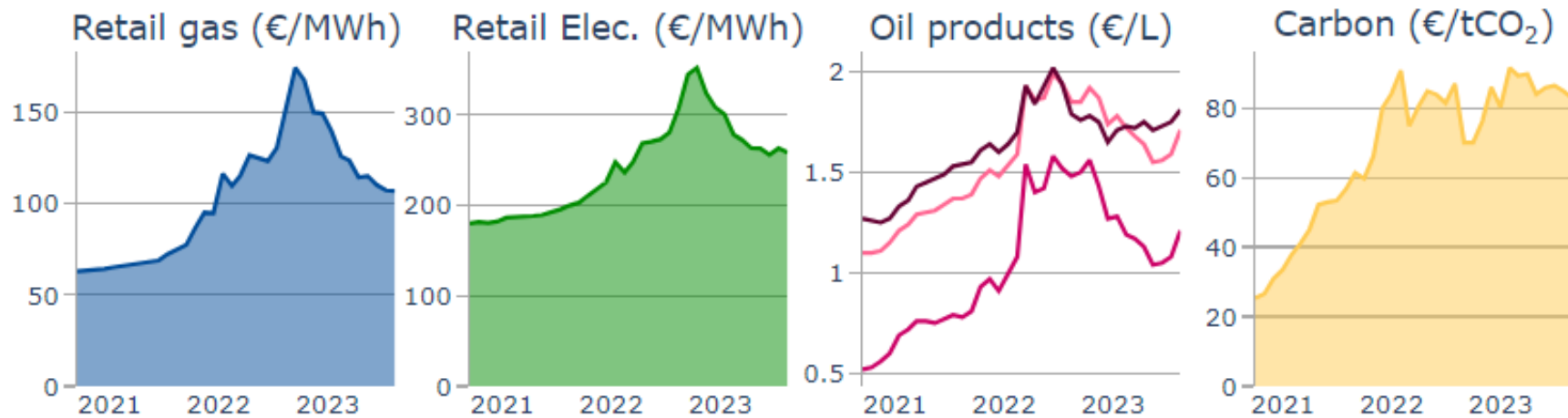


Source: ENER/CET based on S&P Global Commodity Insights and ENTSO-G-Transparency Platform

...translating in other energy commodities



Improving energy landscape in the EU over the last year but prices remain above pre-crisis levels

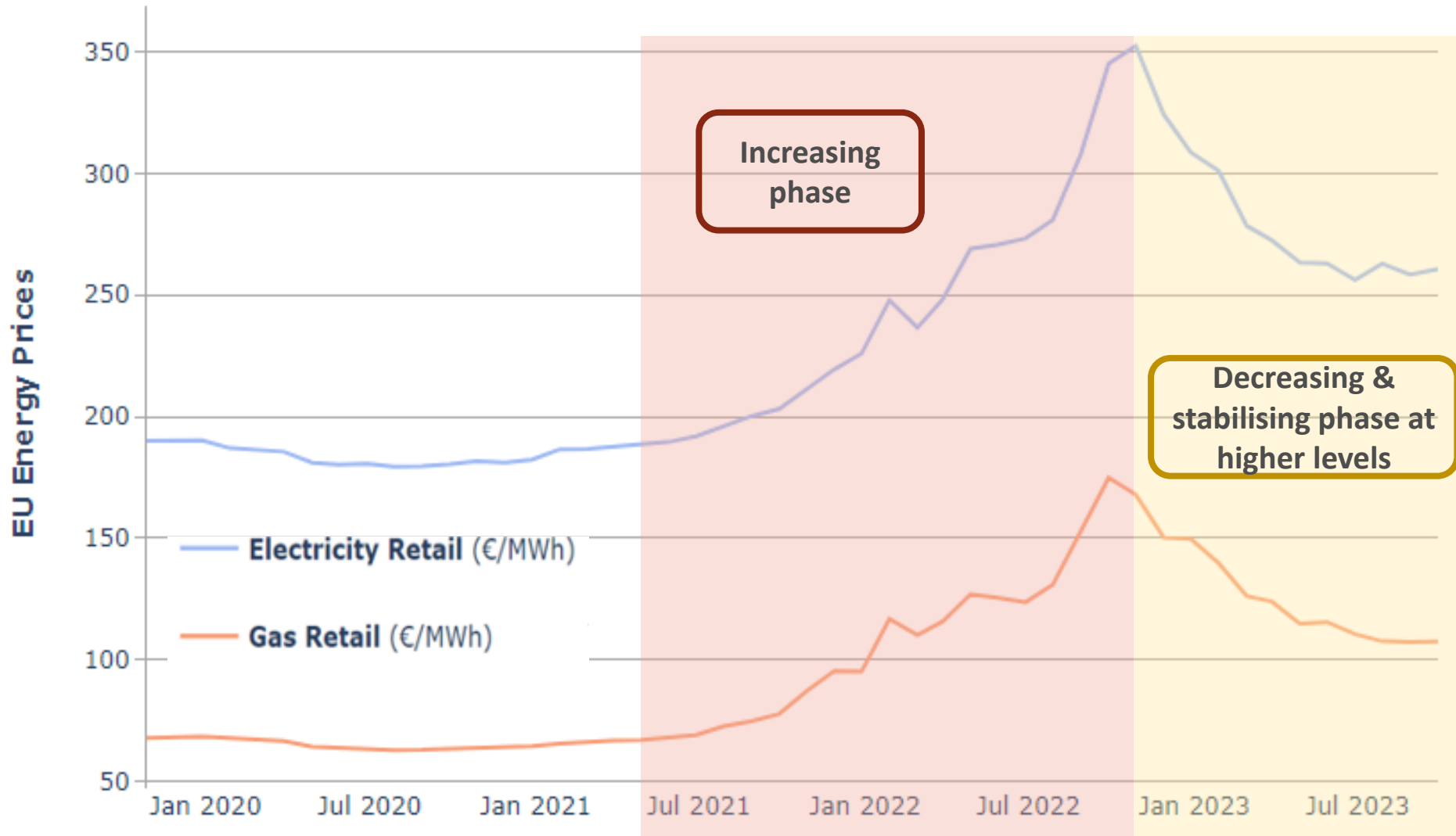


2 fold leverage effect between gas and electricity prices

Gas power plant efficiency: 2 energy units of gas to produce 1 unit of electricity

Sources: ENER/CET (based on S&P Global Commodity Insights, VaasaETT, Weekly Oil Bulletin)

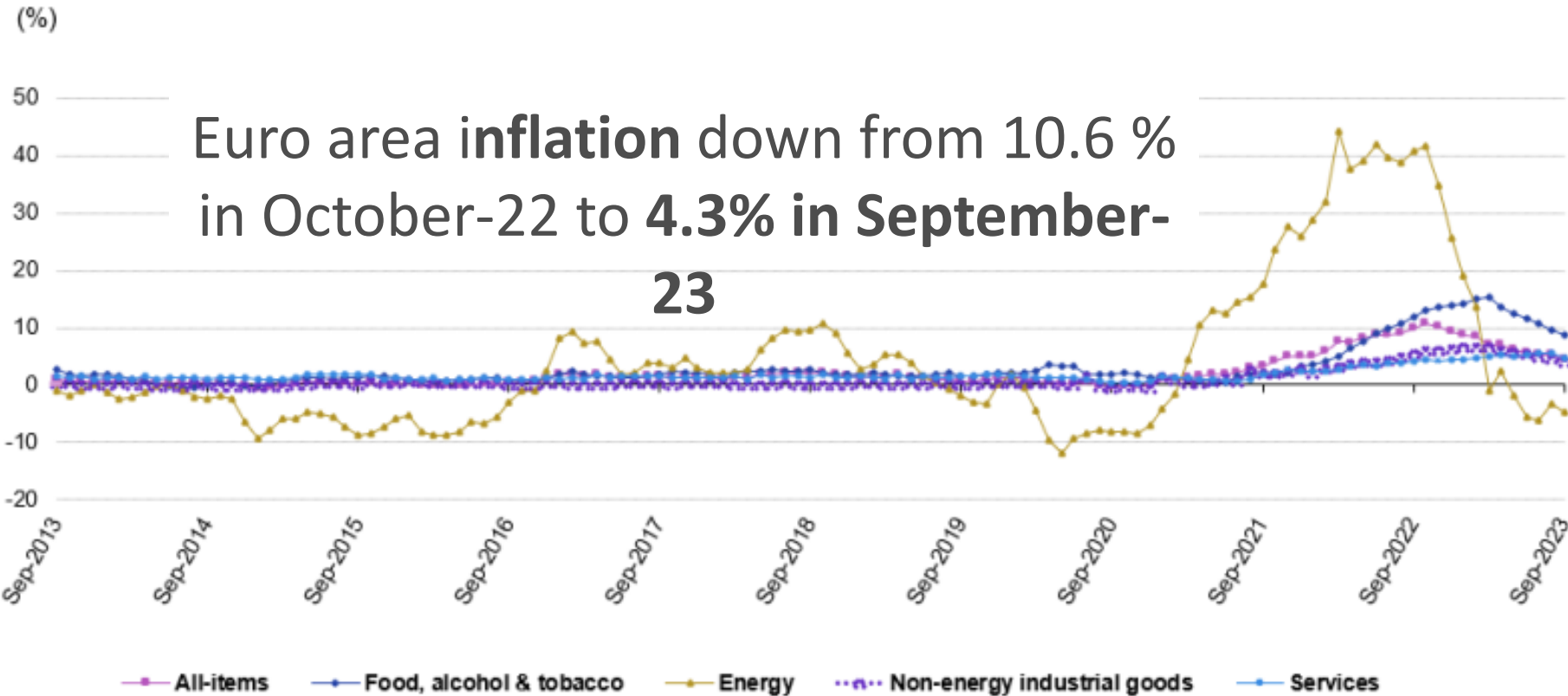
...translating into high retail prices...



Source: ENER/CET based on VaasaETT

...translating into inflation

Euro area annual inflation and its main components, September 2013 - September 2023 (estimated)

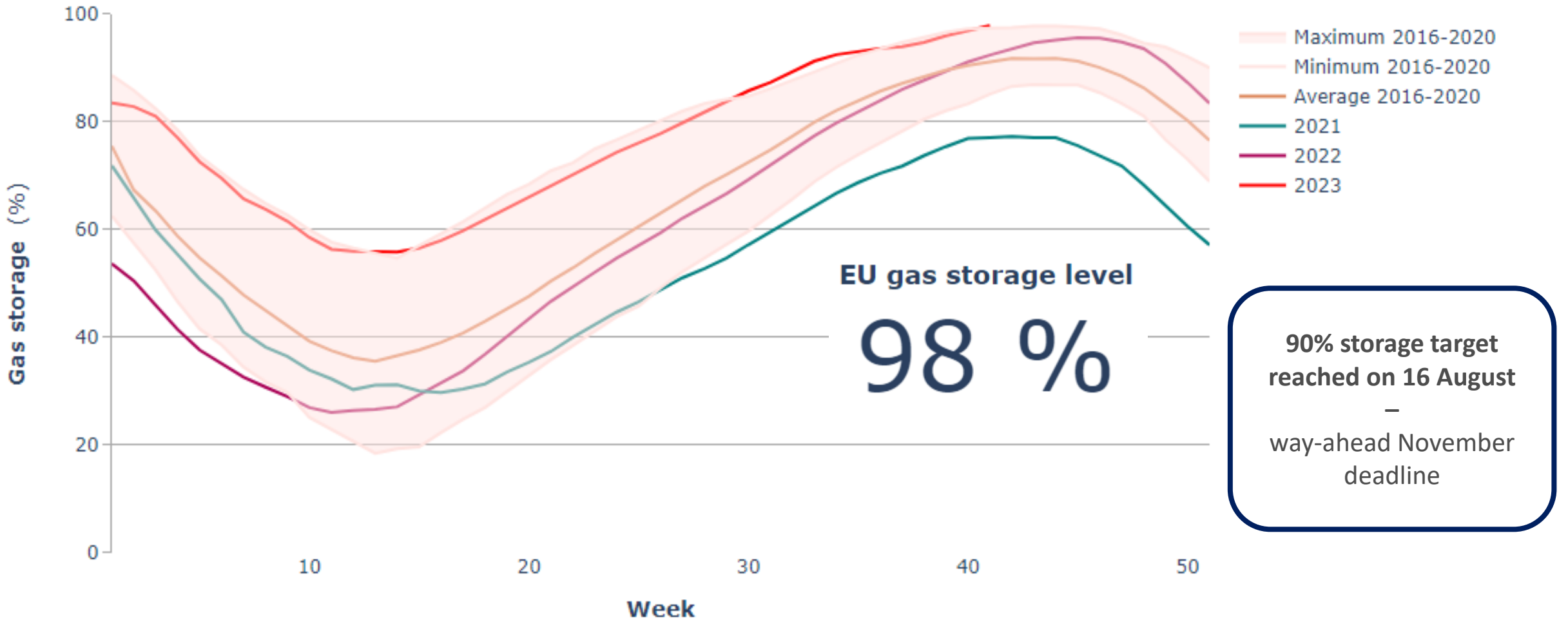


Energy inflation down from 41.5% in October-22 to -3.3% in August-23

Progressive shift in inflation driver from energy to food & services

Source: Eurostat

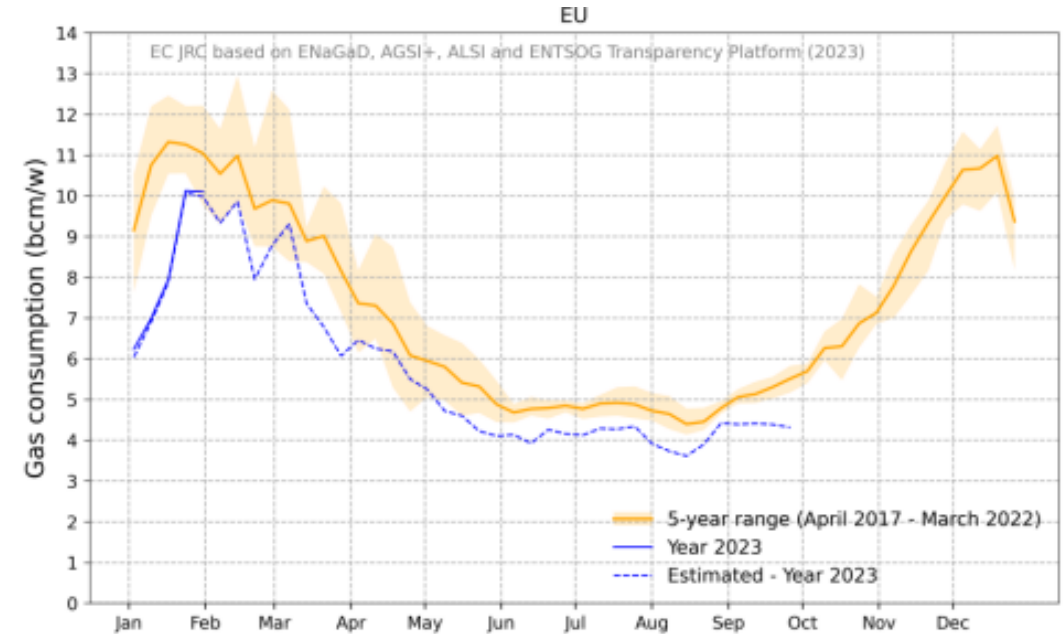
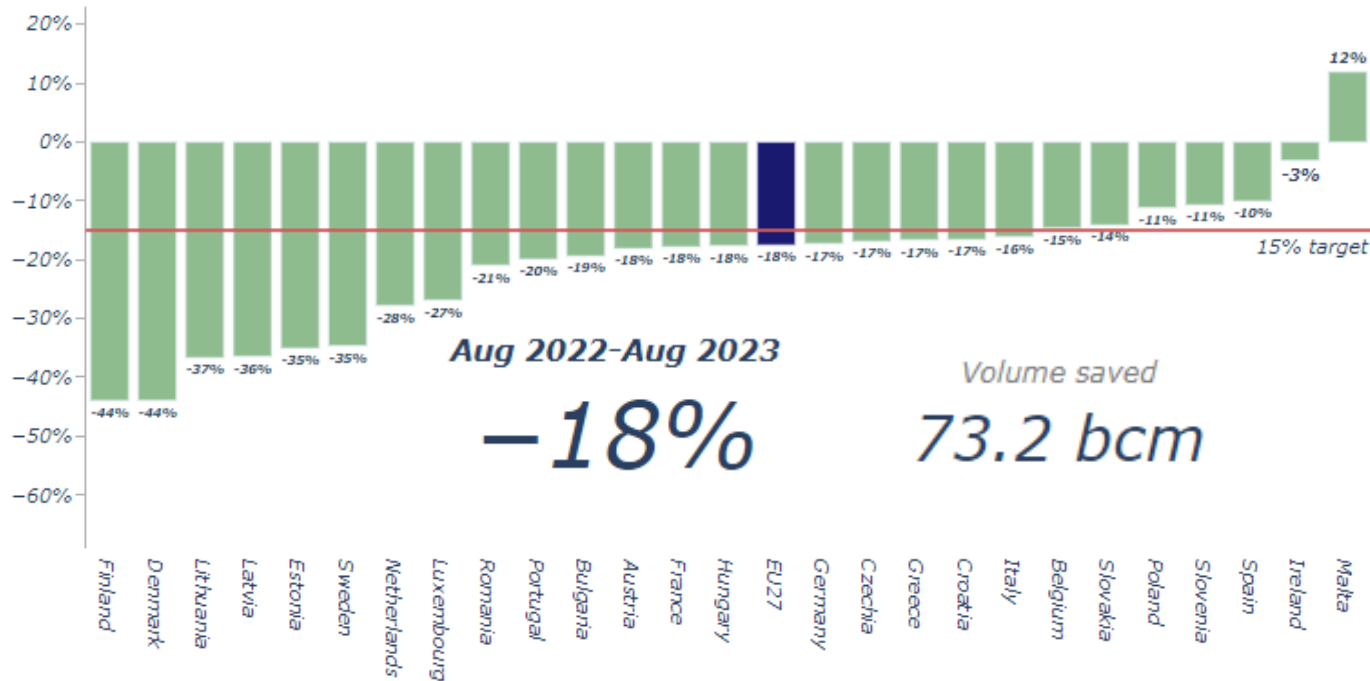
Storages - Improved gas market fundamentals



Source: ENER Chief Economist (based on GIE-AGSI)

Demand reduction - Improved gas market fundamentals

Natural gas demand reduction (Aug 2022-Aug 2023 vs reference period*)

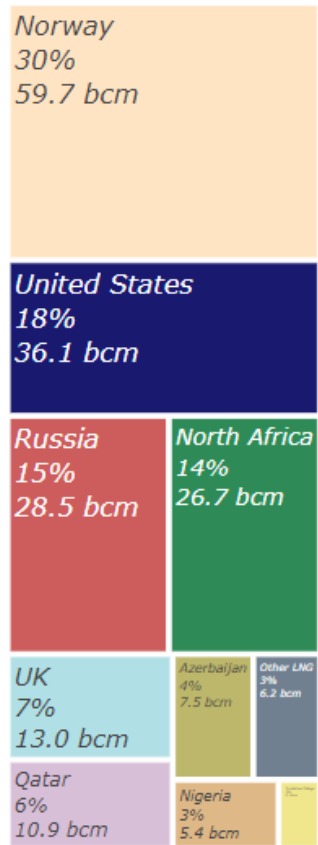


Source: ENER Chief Economist (based on Eurostat)

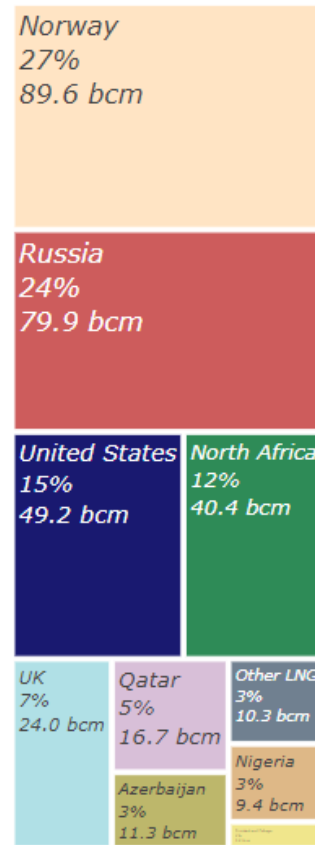
Imports - Improved gas market fundamentals

Natural gas (pipeline & LNG) imports in the EU

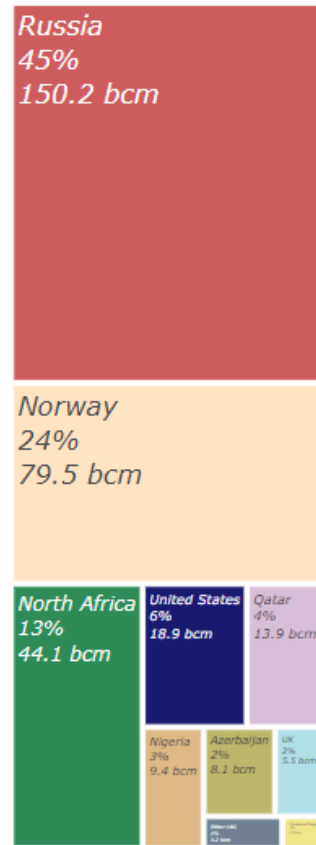
2023 (up to Aug.) - 196.1 bcm



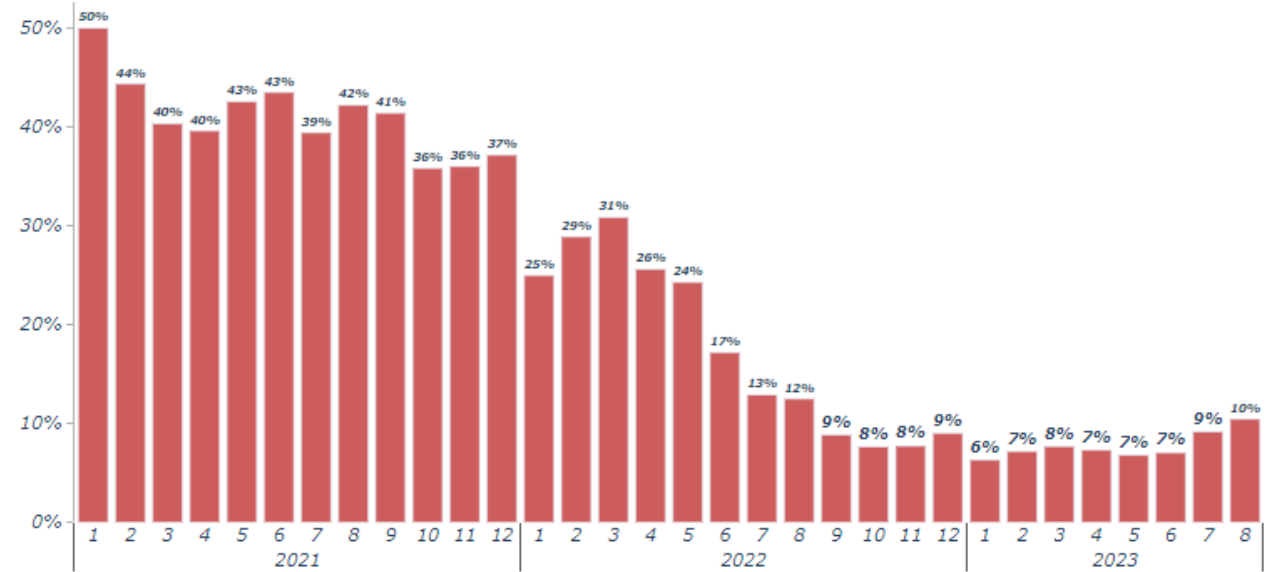
2022 - 334.1 bcm



2021 - 334.3 bcm



Share of Russian pipeline gas in total EU gas imports



70 bcm of additional non-Russia supply:

- **LNG imports** (+109% when comparing July 2023 to July 2021)
- **Pipeline flows** from Norway, Azerbaijan, UK, Algeria

Source: ENER Chief Economist (based on ENSTO-G, Refinitiv)

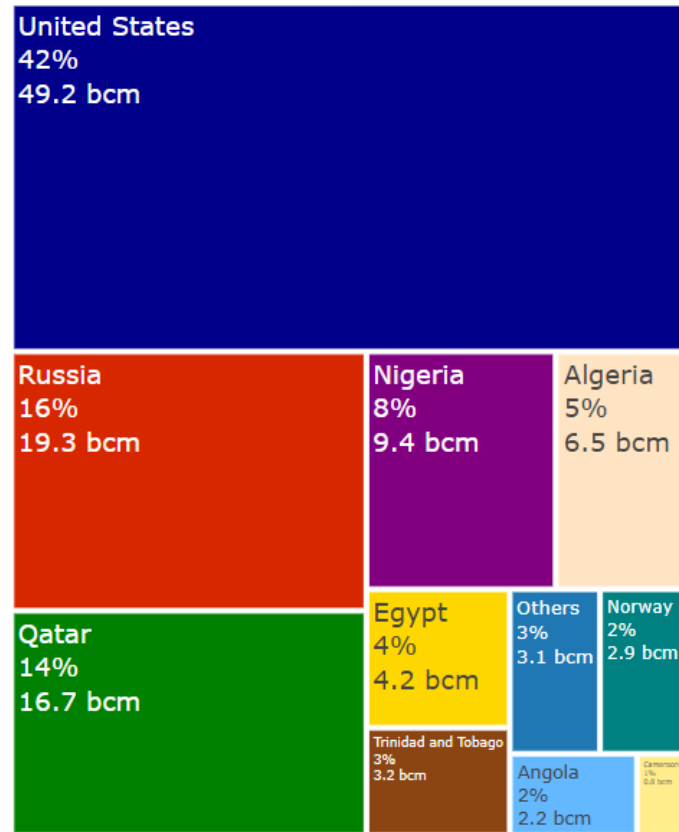
LNG imports - Improved gas market fundamentals

Gross imports of LNG in the EU (bcm)

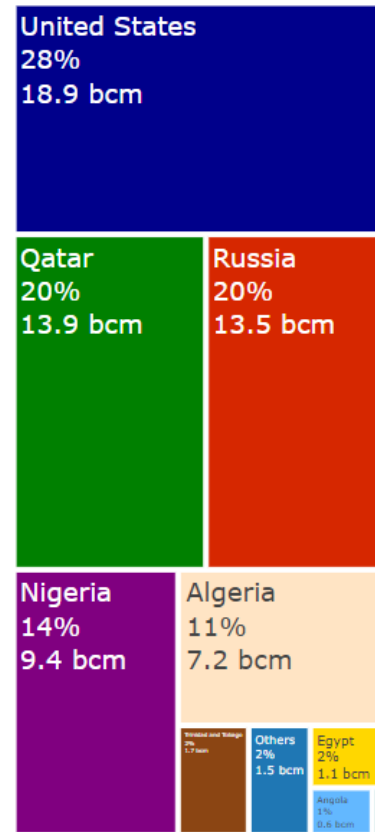
2023 (up to Aug.) - 82.4 bcm



2022 - 117.6 bcm



2021 - 67.9 bcm



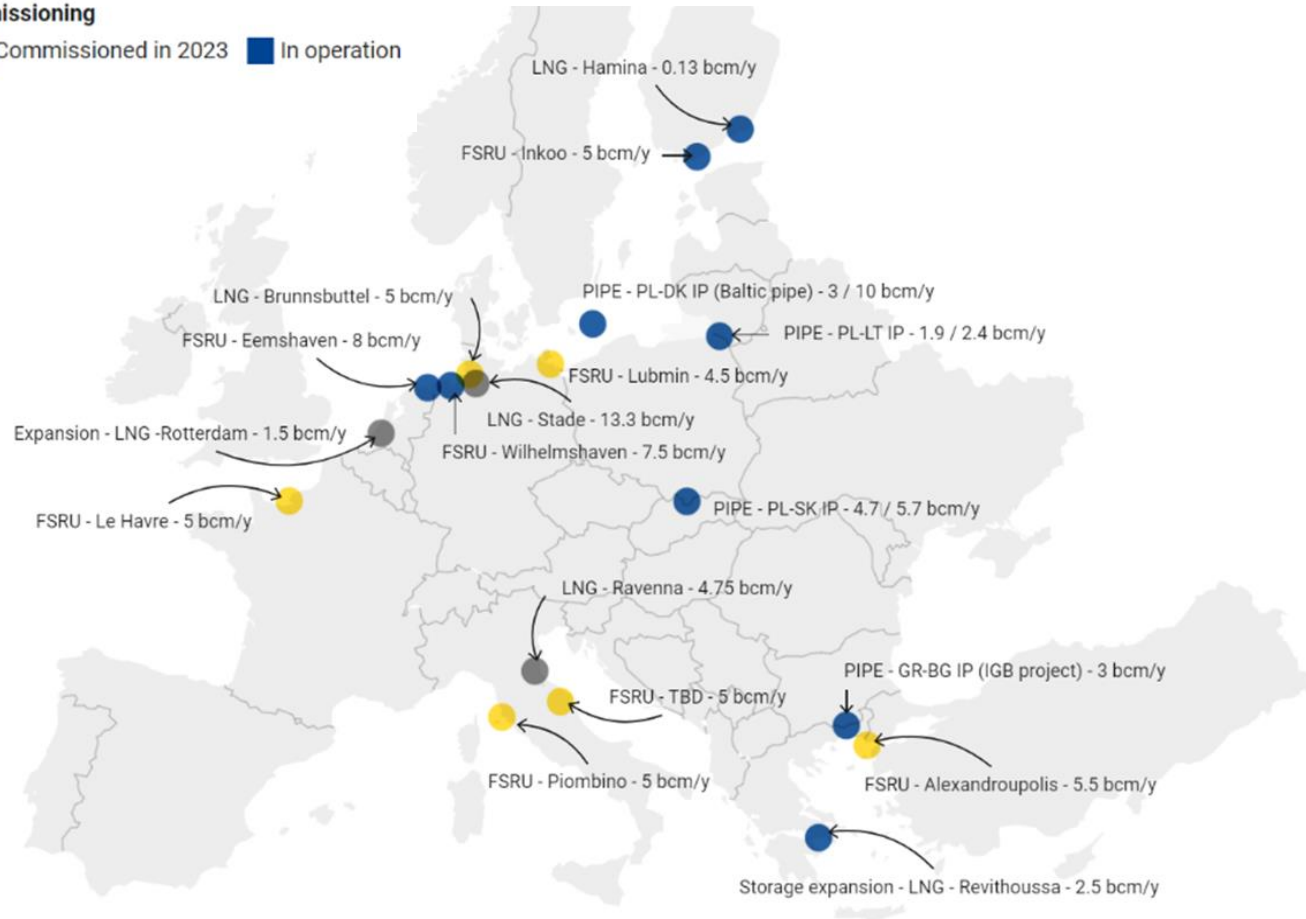
Source: ENER Chief Economist (based on ENSTO-G, Refinitiv)



New EU gas infrastructure projects (2022-24)

Year of commissioning

■ 2024 ■ Commissioned in 2023 ■ In operation



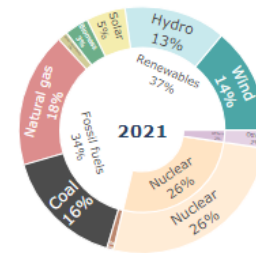
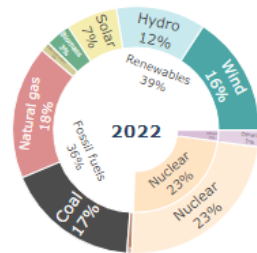
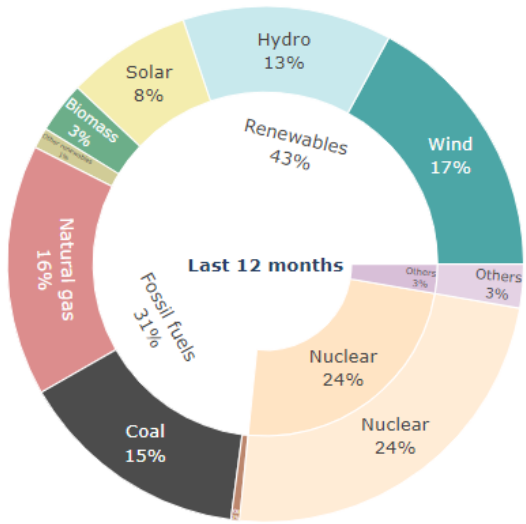
More LNG can be imported - total added LNG import infrastructure in EU:

- +35 bcm/y in operation
- +35 bcm/y to be commissioned

FSRU stands for Floating Storage and Regasification Unit

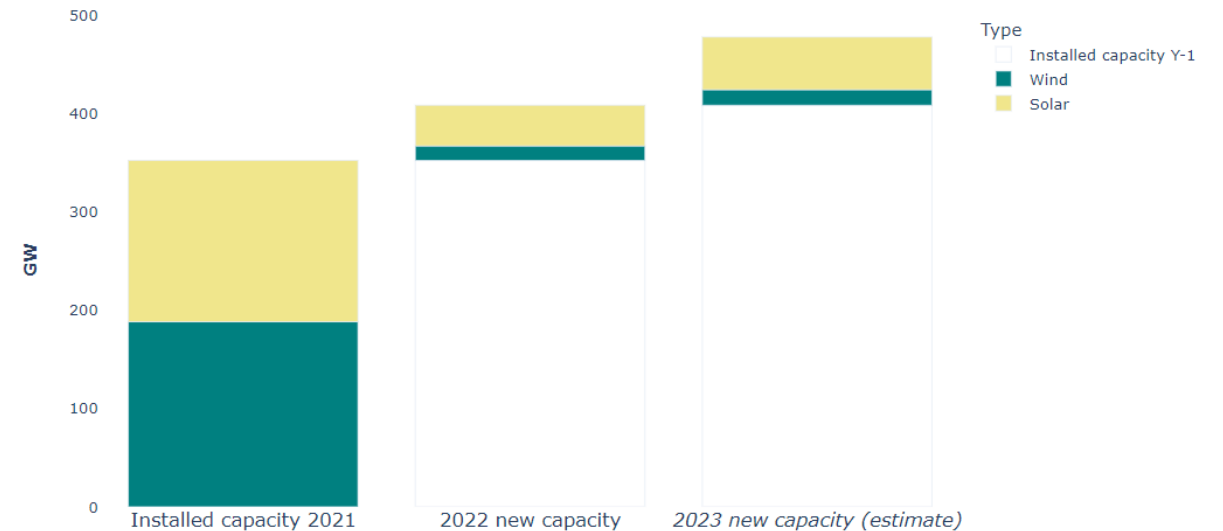
Renewables - Improved electricity market fundamentals

Electricity power generation per sources



- Share of RES in electricity mix: 37% in 2021 to 43% over the last 12 months
- Share of gas in electricity mix: 18% in 2021 to 16% over the last 12 months
- **56 GW of new installed RES capacity in 2022** (around 11 bcm of gas saved)

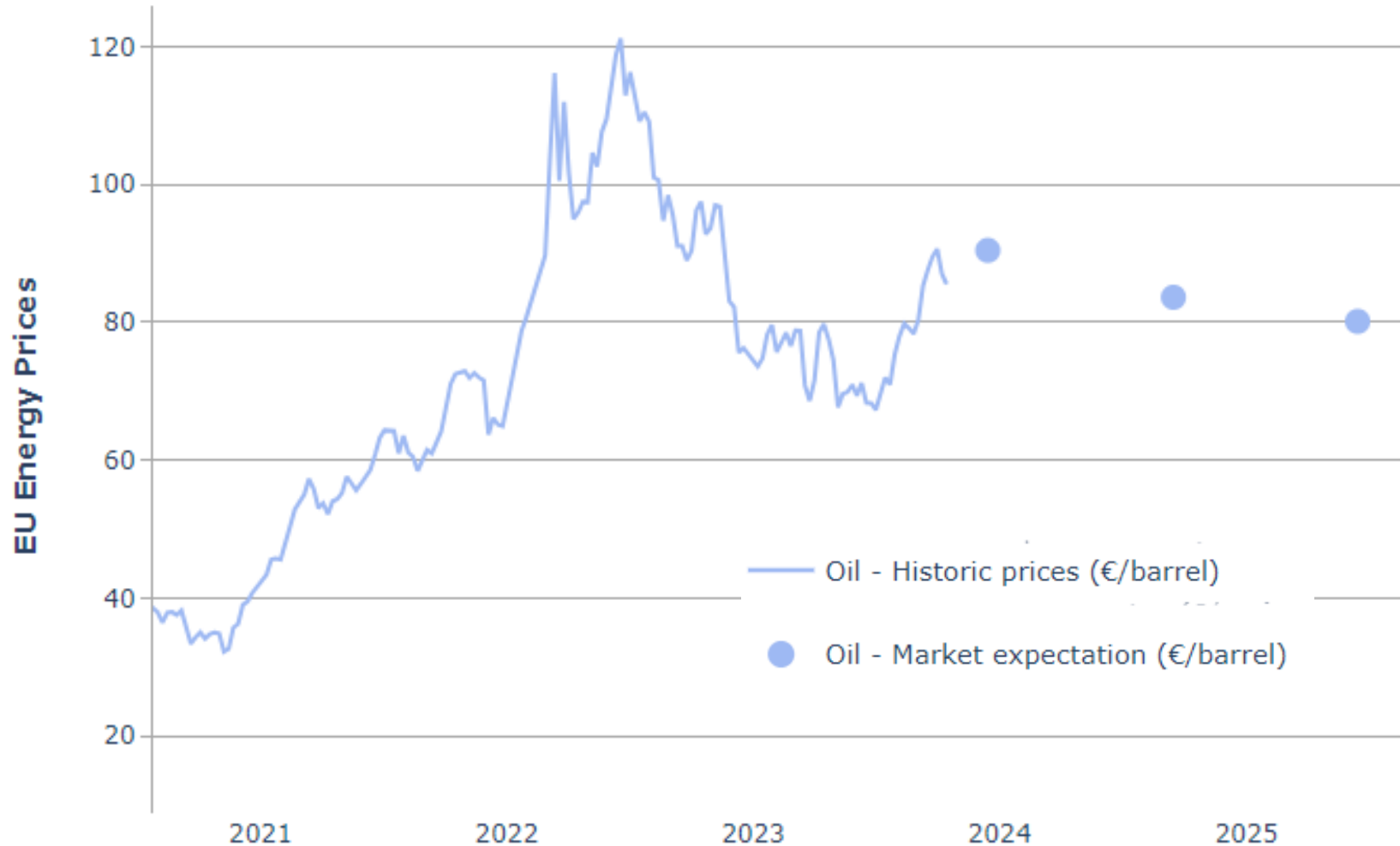
Wind & Solar installed capacity



Renewables also helping to reduce gas demand for power generation

Source: ENER Chief Economist (based on Fraunhofer, ENTSO-E, Solar Power Europe, WindEurope)

Recent developments on oil market



Tight oil markets and high prices expected for the remaining of 2023

- Crude oil prices recently jumped to **above 90 \$/barrel** on
 - the **prolongation of cuts** by **Saudi Arabia** and **Russia**
 - **tensions in the Middle East** that could affect supply
- But high prices **partly balanced by low demand** and **concerns over macroeconomic outlook**
- Member States have **refilled their emergency oil stocks** in line with EU legislation

Decisive EU policy action and market rebalancing

Similar spikes as those experienced in the summer of 2022 less probable this year all things being equal:

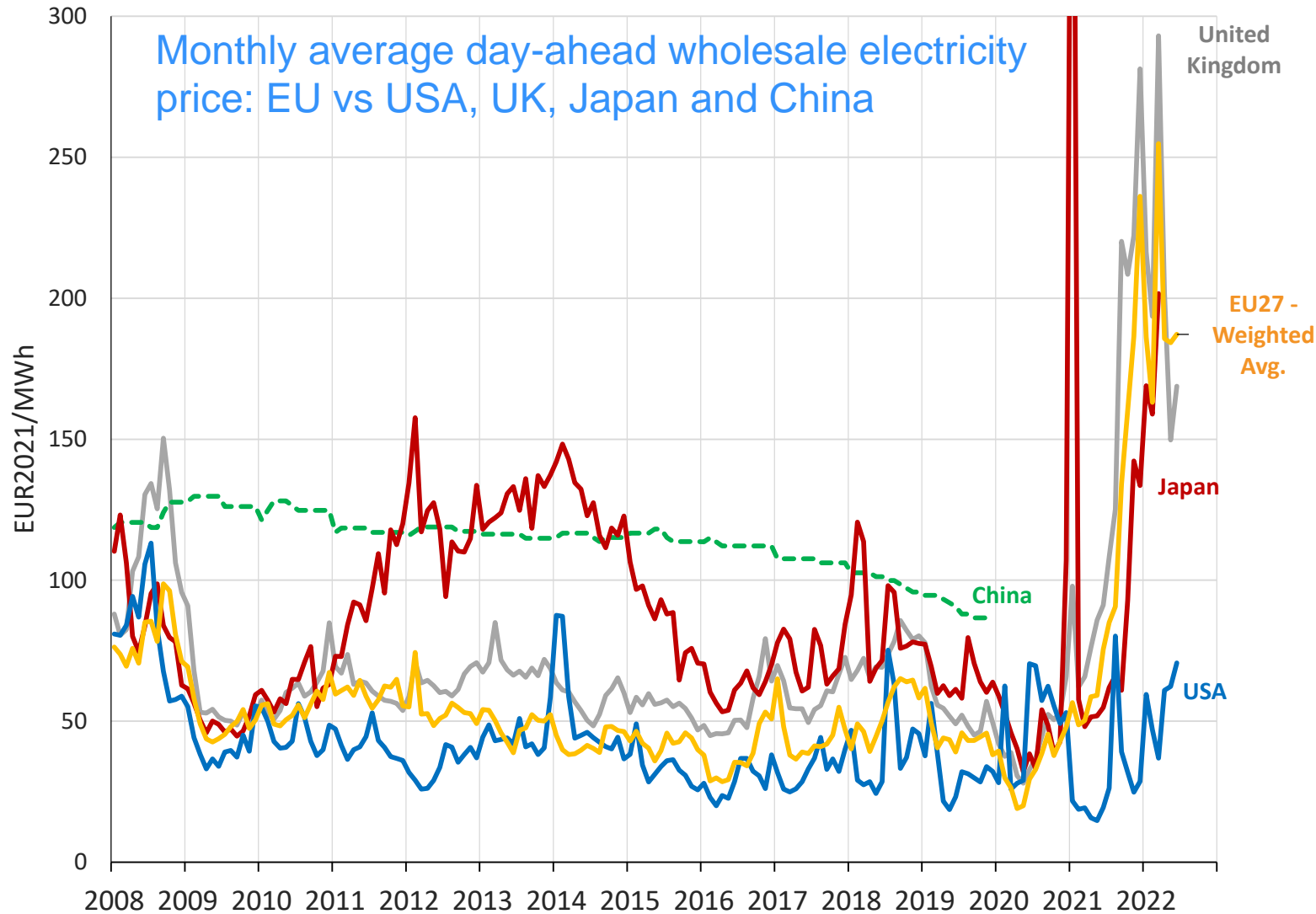
- 1. High storage levels:** 96% at 1st of September 2023 versus 90% on average on the same day during the reference years (2016-2021).
- 2. Natural gas demand reduction:** 17% reduction until August 2023 (part of it structural)
- 3. Lower possibility for Russia to weaponise energy markets:** from 45% of total EU natural gas imports at the start of the war to 15% now
- 4. More infrastructure added to remove bottlenecks:** More infrastructure added to remove bottlenecks
- 5. Less uncertainty** (e.g. ACER benchmark)

Lessons learned from the crisis

1. Expanding installed capacity of **renewable energy sources can help limit prices spikes** by minimising the role of gas in electricity generation...**but it will take time.**
2. **The pass-through from wholesale to retail energy prices differs significantly across Member States** driven, among others, by taxation, contract indexation, public support, etc.
3. **Natural gas futures have proven not to be an accurate predictor of future price developments**, in the context of a turbulent market.

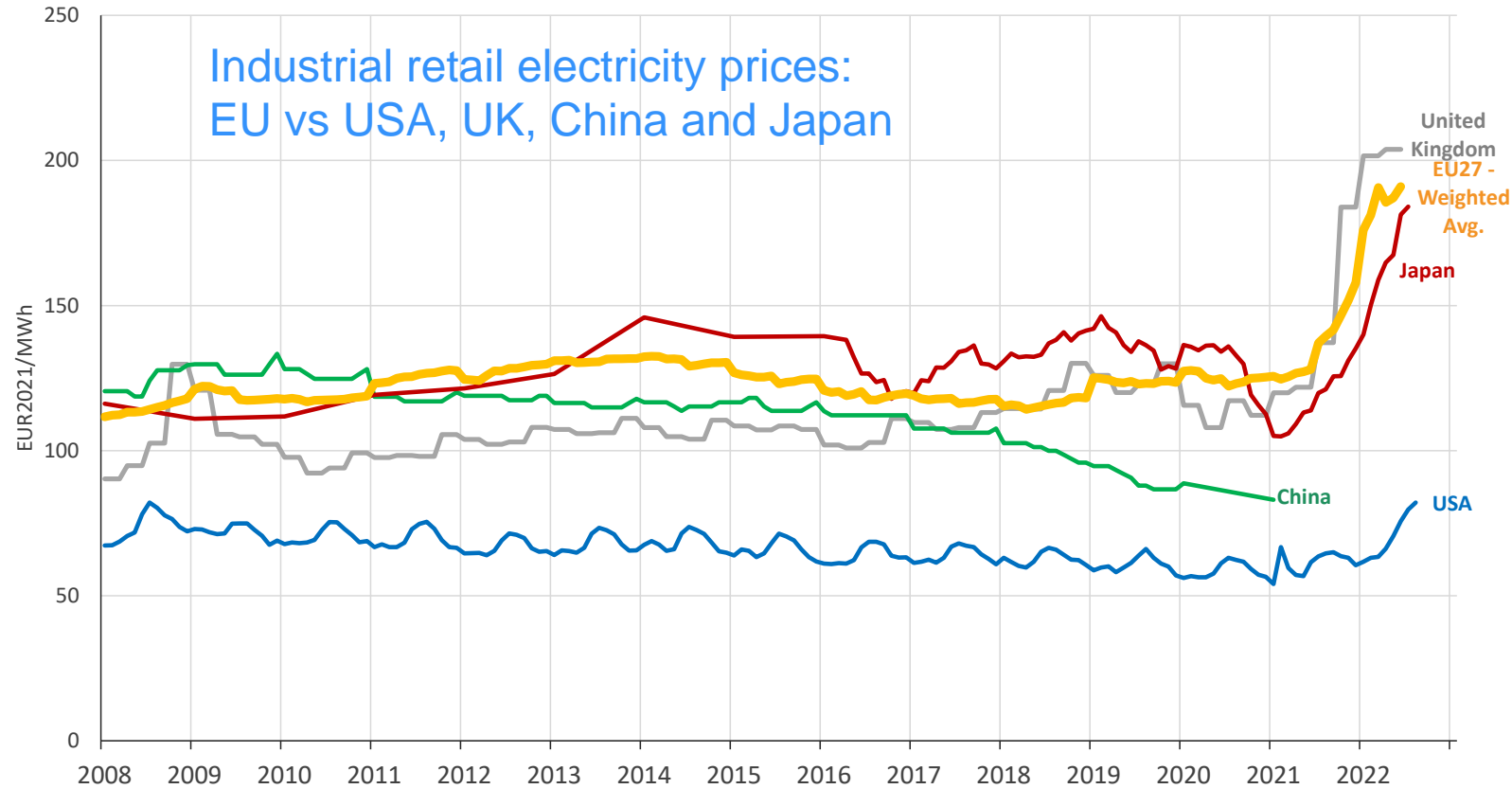
Competitiveness

Wholesale Electricity price differentials: EU vs other global trading partners (I)



EU electricity wholesale prices 2 to 4 times higher than in the US (July 2021 to July 2023)

Retail Electricity price differentials: EU vs other global trading partners (II)



Similar price differentials trends observed in retail electricity industrial prices (yet less pronounced)

Gas price rises and differentials underline the EU Energy Intensive Industries' competitiveness challenge

Industrial production development in manufacturing and energy-intensive industries in Germany

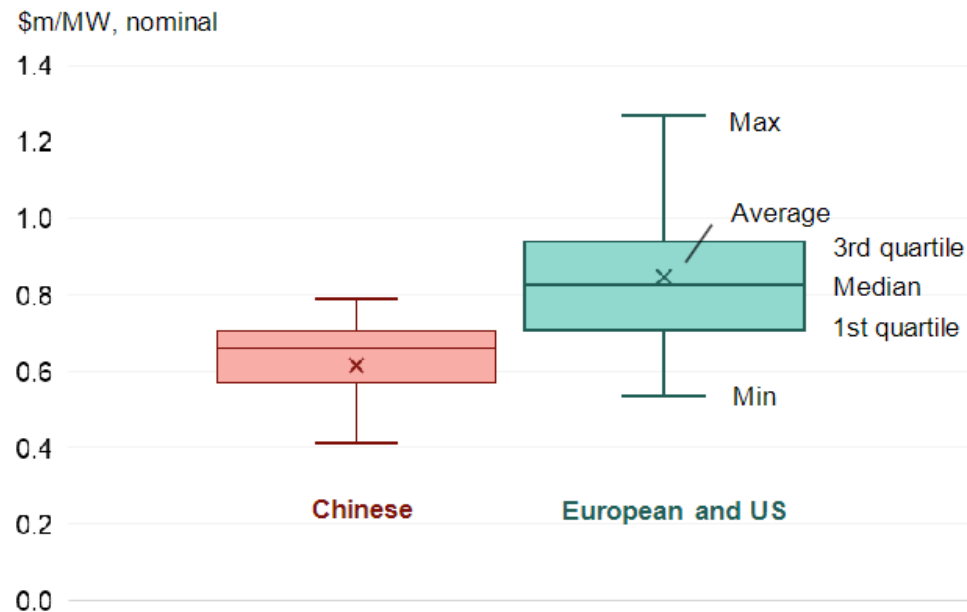


Source: Federal Statistical Office of Germany

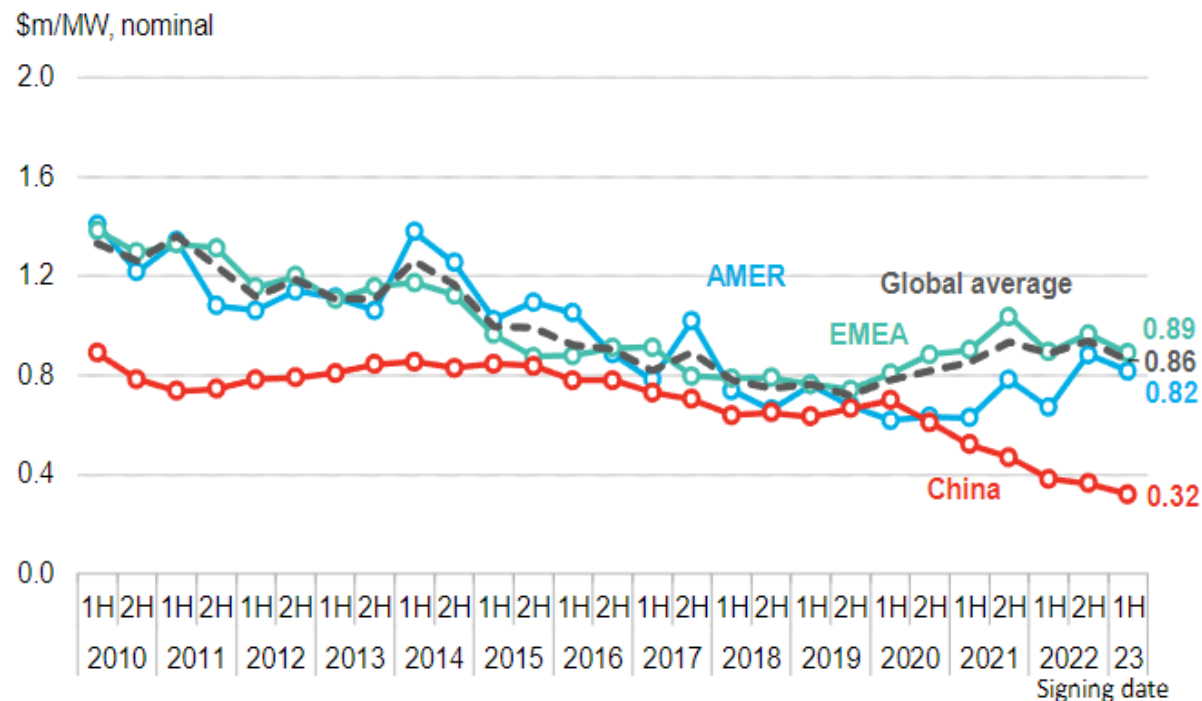
- EU reduced natural gas consumption by **17%** (between August 2022 and August 2023)
- The **industrial sector** was the **second largest contributor** to the reduction in gas demand (43%).
- The energy crisis has led to a **production reduction concerning sectors with high gas consumption.**
- However, **the overall manufacturing seems to be able to resist the fall in gas consumption.**

Clean techs competitiveness challenges

Price of Chinese and Western wind turbines



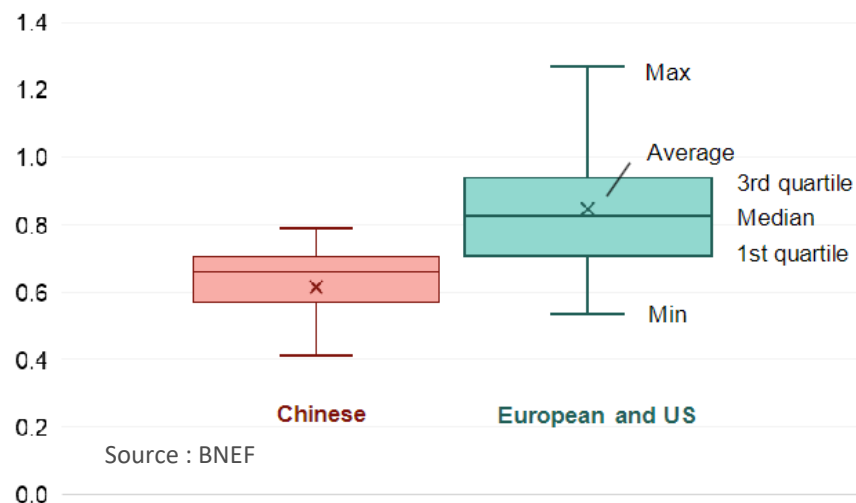
Source : BNEF



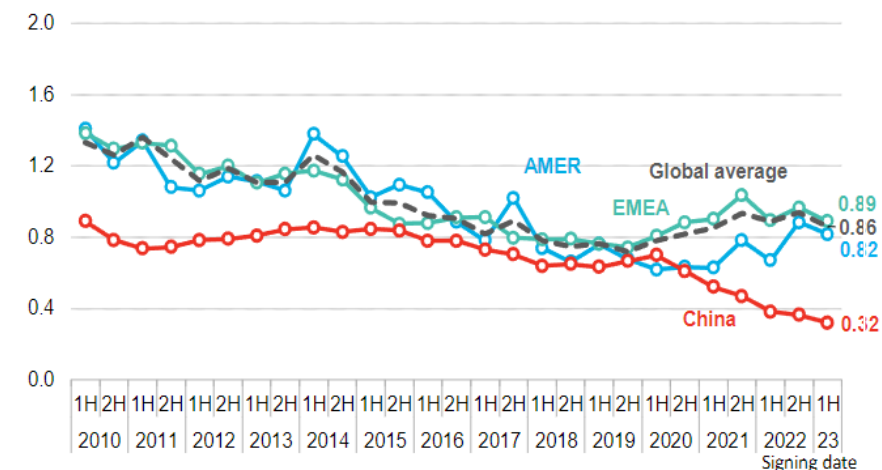
Clean techs competitiveness challenges

Price of Chinese and Western wind turbines

\$m/MW, nominal



\$m/MW, nominal

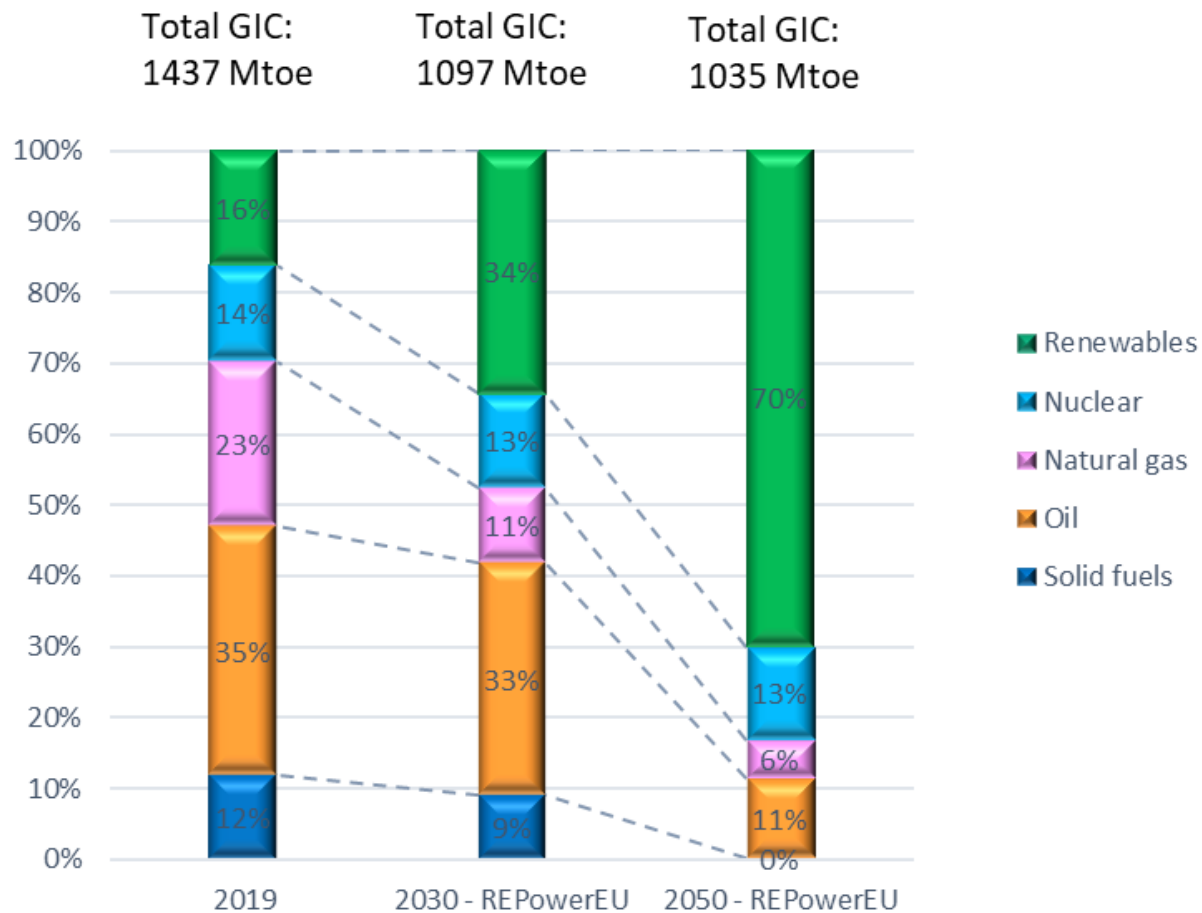


- **US' IRA, Chinese subsidy policies, inflation and rising interest rates** are posing challenges to EU competitiveness. EU will need to **keep supporting its industry:**

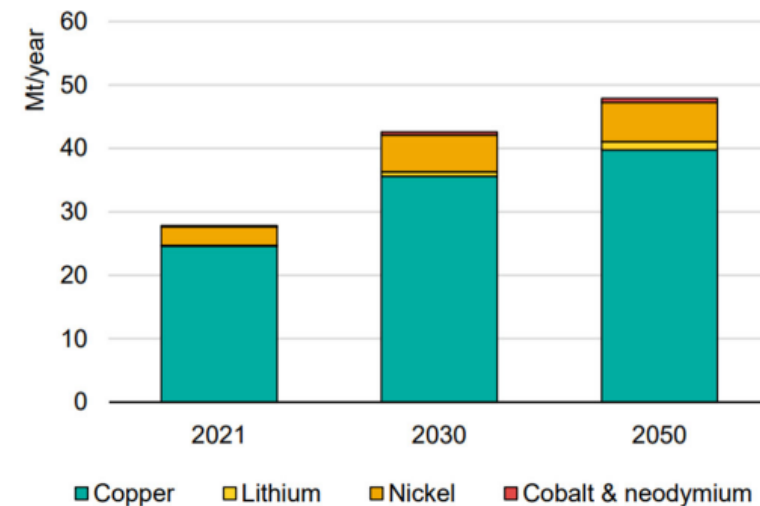
- Upcoming **European Wind Power package** focusing on permitting, skills, improved access to finance and stable supply chains
- **Green Deal Industrial Plan** and the **Net-Zero Industry Act:** overcoming barriers to the scale up of net-zero technologies manufacturing and increase competitiveness
- **Strategic Technologies for Europe Platform (STEP)** which aims to speed up access to funding for the net-zero industry
- **European Critical Raw Materials Act**

Inflation in the green transition

Energy sector: massive structural change with the green transition



Total global demand for critical materials by type in the Net Zero Emissions Scenario of the International Energy Agency



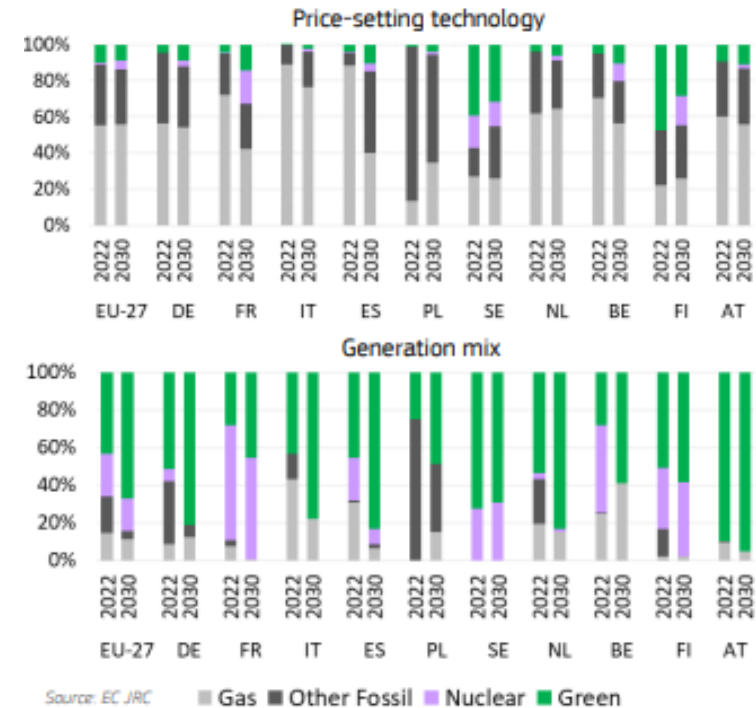
Sources: International Energy Agency (2023): Energy Technology Perspectives 2023
Notes:

Source: Eurostat and European Commission ENER Chief Economist Team on the basis of projections from PRIMES model

When will renewables deliver cheaper prices?...it will take time

- With the displacement of fossil fuels from the electricity mix, electricity prices will fall over time
- Increase of cross border grids will eventually narrow electricity price spreads between market zones
- Still, the gas price will remain a strong driver of electricity prices until the end of this decade
- Marketing of renewable electricity through PPAs is expected to gain in importance







Share of generation and price setting hours (both in %)



Source: <https://publications.jrc.ec.europa.eu/repository/handle/JRC134300>

By 2030, gas fired power stations will still be setting the electricity price in 55% of all hours despite renewables providing two thirds of all electricity

Sequence and policy choices matter

| | |
|--|---|
| <p>Changes in commodities and the energy mix, if no cheap and stable access to:</p> <ul style="list-style-type: none">• Critical raw materials• Diminishing volumes of fossil fuels setting electricity prices during the transition |  |
| <p>Changes in overall demand and consumption patterns, including:</p> <ul style="list-style-type: none">• Demand-response and self-consumption• A higher capital expenditure with lower operating costs |  |
| <p>Increase in the share of renewables in the electricity generation coupled with demand response, storage and higher level of interconnections, but not before 2030/2035.</p> |  |
| <p>Replacement of the capital stock and infrastructure (incl. skilled workforce) - about €487bn /year in the energy system alone</p> |  |
| <p>Carbon prices and taxation</p> |  |
| <p>Uncertainty and higher risk premiums</p> |  |

Thank you

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