



European Union Agency for the Cooperation  
of Energy Regulators

# Key developments in European gas wholesale markets

## 2024 Market Monitoring Report

20 March 2024

Report in PowerPoint format



The document provides an overview of **EU wholesale gas markets trends in 2023**.

Specifically, it addresses:

- Gas price evolution and drivers;
- Gas consumption and its components;
- Gas supply trends;
- Gas infrastructure utilisation;
- Gas trading developments.

It also includes selected forward-looking considerations, with more to come throughout the year.



Explore the [new market monitoring section](#)  
of the ACER website for additional  
information about European energy markets.

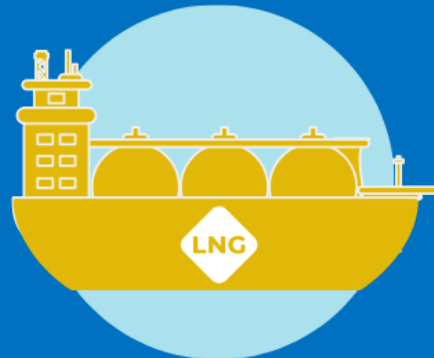
**-8%**

Decrease in gas  
consumption  
in 2023



**+50 BCM/Y**

Additional LNG  
import capacity



**41 EUR/MWh**

Average TTF  
day ahead price



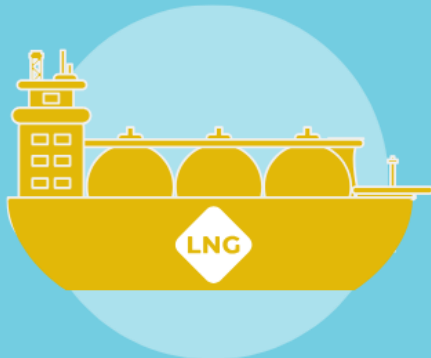
**99.9%**

Gas storage stock  
at start of  
winter 2023



**51%**

Average utilisation of  
EU LNG capacity in  
first quarter of 2024\*



**27 EUR/MWh**

Average TTF day  
ahead price  
in first quarter of 2024\*



**59%**

Gas storage stock  
at end winter 2023\*

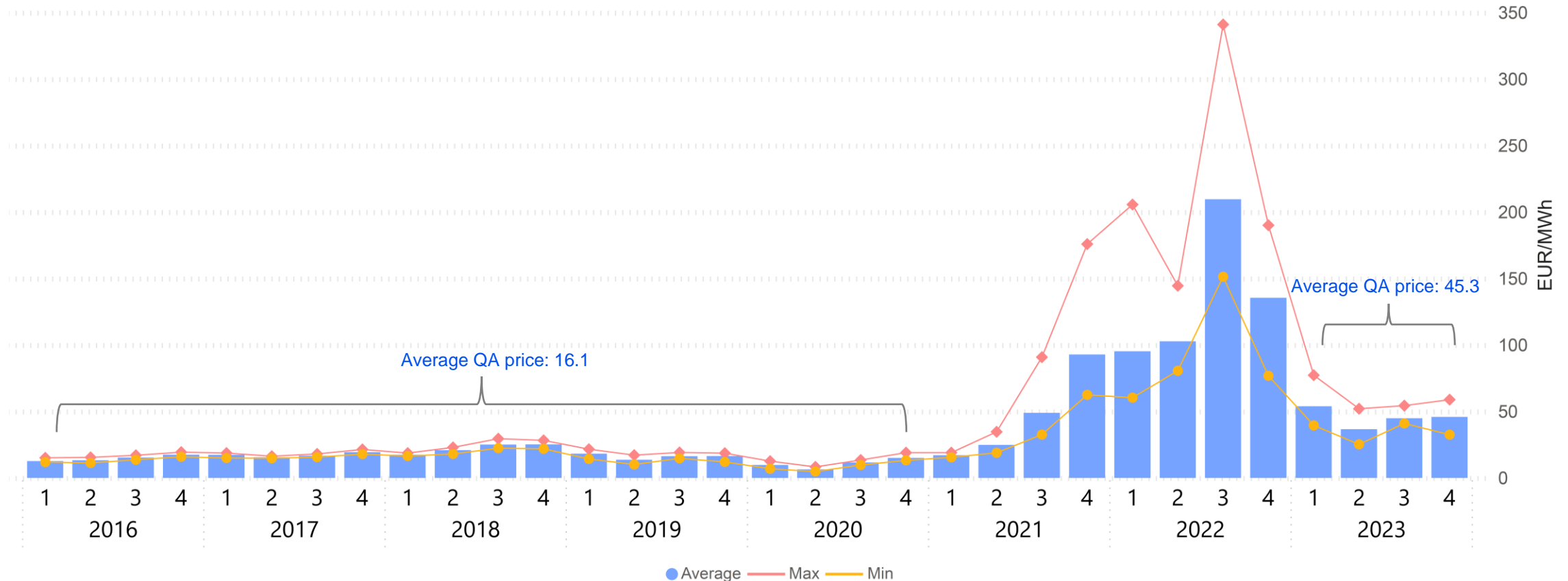


# Price developments

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# Gas prices fell but remained high and volatile in 2023

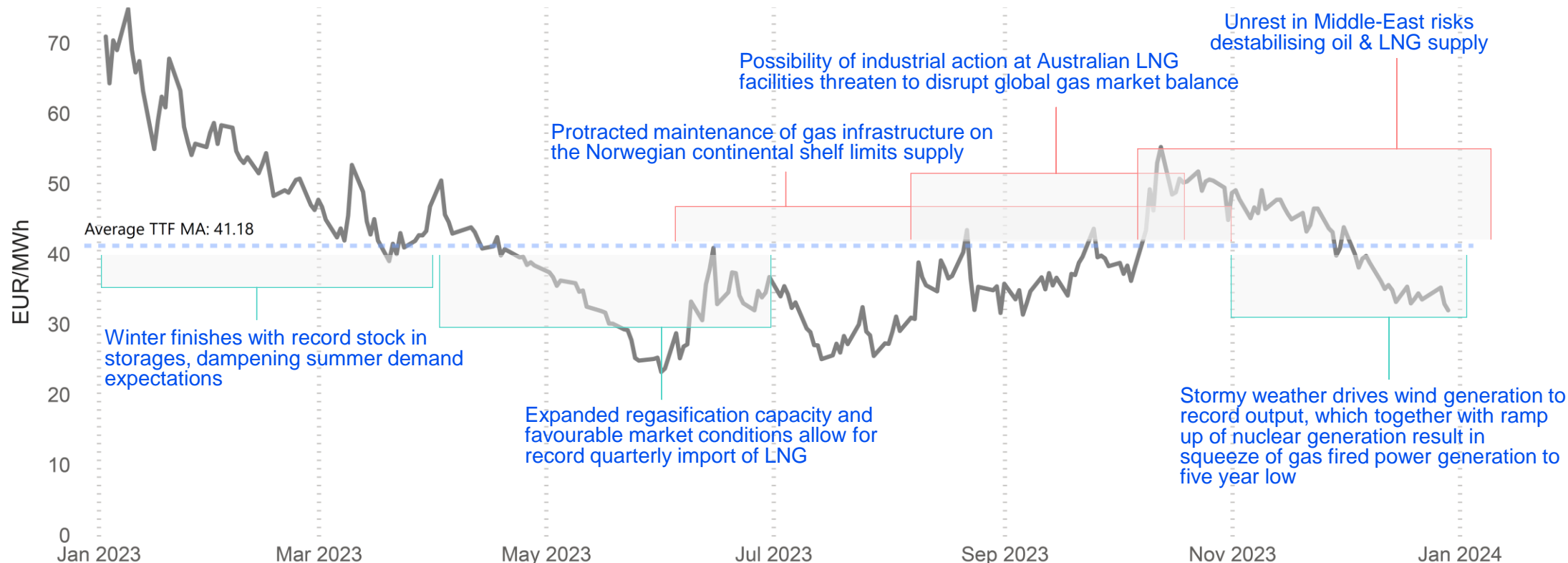
Quarterly average, maximum and minimum gas wholesale prices, 2016–2023 (TTF's quarter ahead (QA) contract)





# Sound market fundamentals counterbalanced perceived geopolitical risk

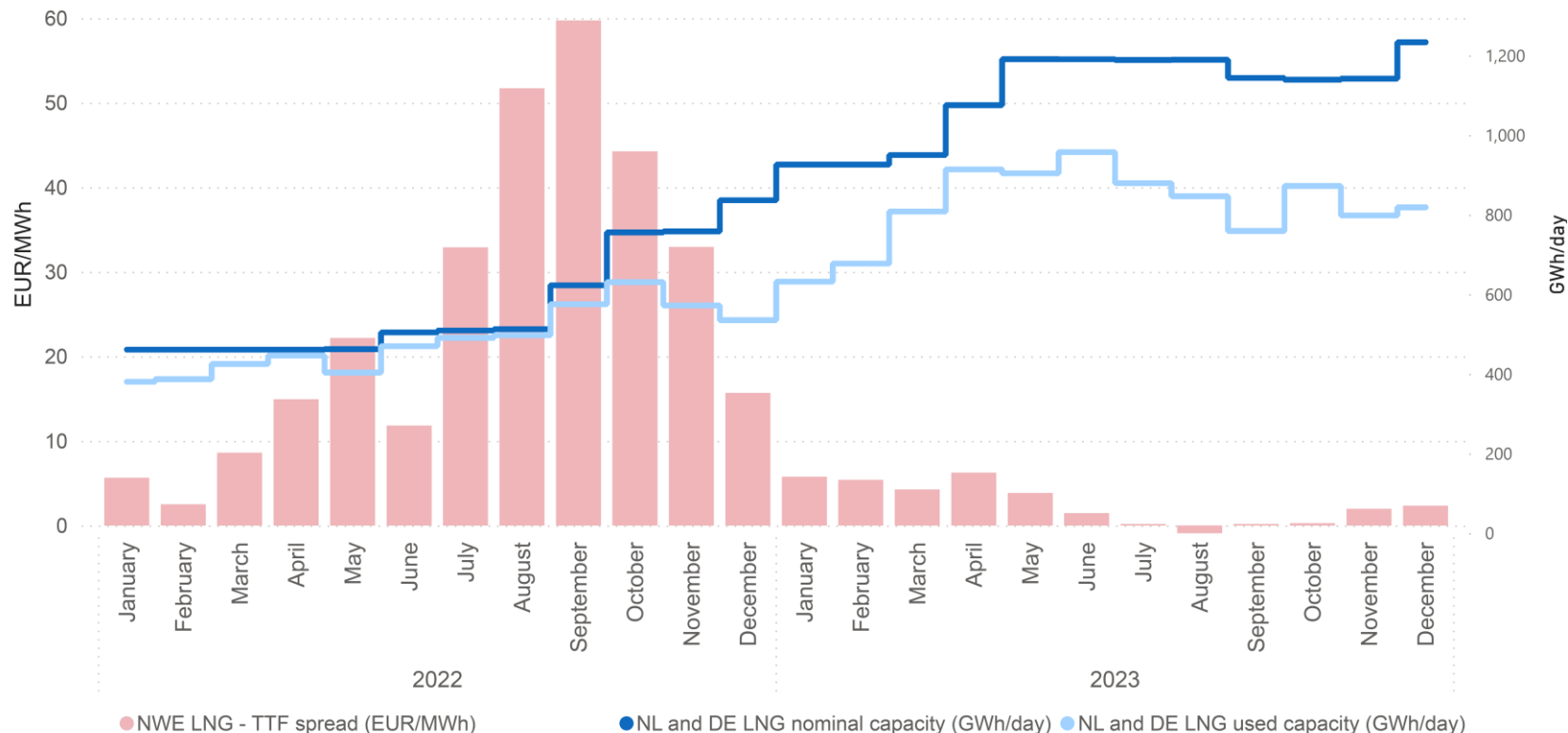
Natural gas price evolution, 2023 (TTF month ahead (MA) contract)



Low demand (including demand for electricity generation), solid gas storage levels at the end of winter, new LNG import capacity and stable gas supply (including of what has remained of Russian pipeline flows) were the main drivers of declining gas wholesale prices across the year. However, events that risk gas supply such as LNG strike action at Australian LNG facilities, unrest in the Middle-East and outages of gas export infrastructure on the Norwegian continental shelf caused prices to rise in periods of 2023.

# New LNG capacity eased congestion, aligning LNG spot and EU hub prices

**Spread between North-West EU LNG and TTF month-ahead prices (left axis) and Netherlands and Germany nominal and used LNG regasification capacities (right axis) , 2022–2023 (EUR/MWh and GWh/day)**



Stay up to date with LNG spot market prices by following the daily ACER LNG price assessment

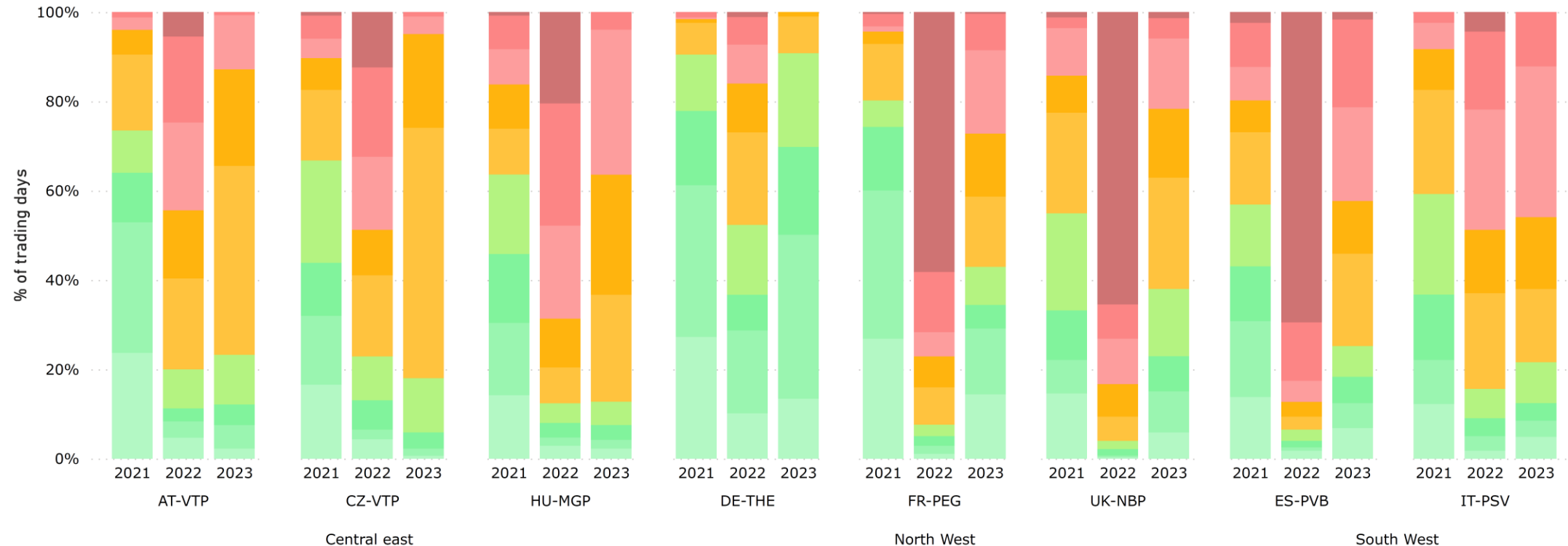


Since mid-2022, LNG regasification capacity in the EU has expanded by 50 bcm/year, primarily in North-West Europe. This expansion has played a crucial role in facilitating an increase of LNG imports and helped to reduce gas network and LNG terminal congestion. As a result, it helped European gas wholesale prices decrease, and gas hub price convergence improvements.



# Price convergence improved but did not reach previous levels

**Natural gas price hub convergence, 2021–2023 (% of trading days with spreads in the price range (Selected hubs, Day-ahead contract))**



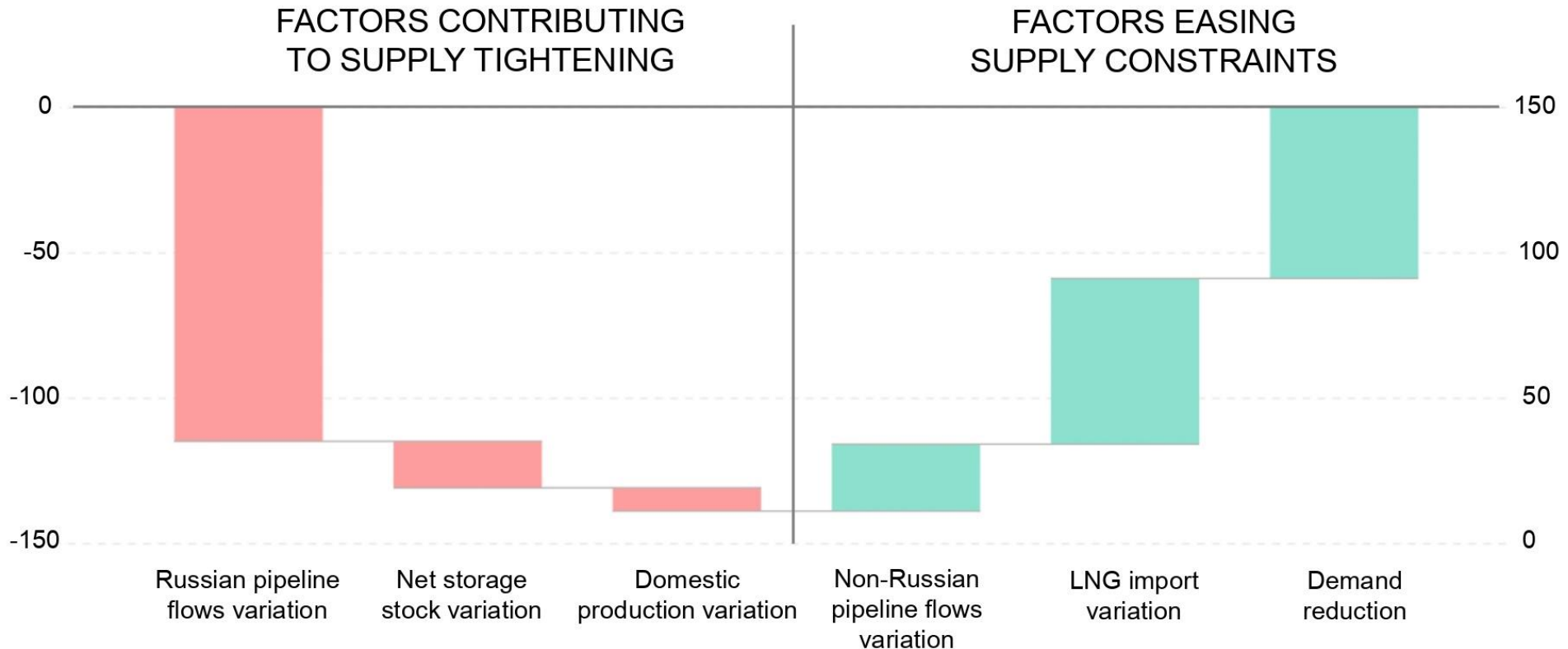
After a year of unprecedentedly high gas hubs' spreads, prices began converging again in 2023. New LNG import terminals and additional gas transportation capacity on some borders helped relieve physical network congestion that drove price divergence in 2022 (itself triggered by a reconfiguration of gas flows necessitated by the stop of Russian pipeline flows). However, price convergence did not recover to levels that were the norm previously.

# Demand, supply and flow developments

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## Increased LNG imports and lower demand offset reduced Russian pipeline supply

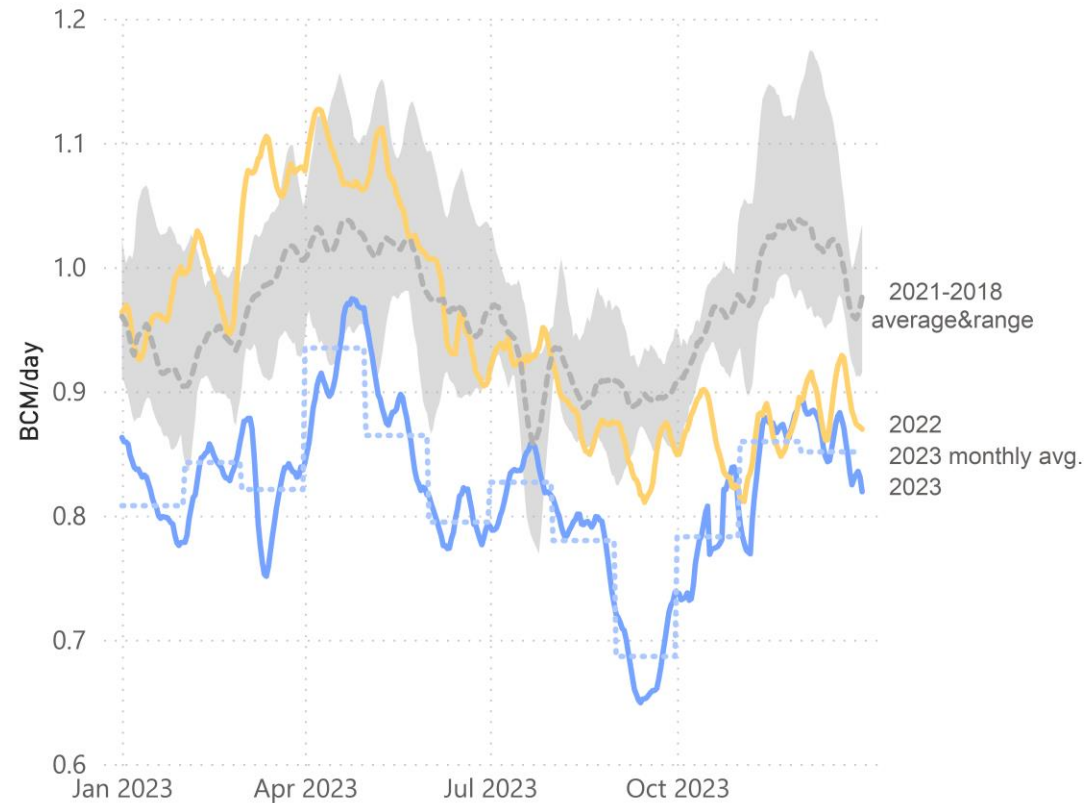
Estimated EU gas supply and demand differences in 2023 in comparison to 2021 (bcm/year)



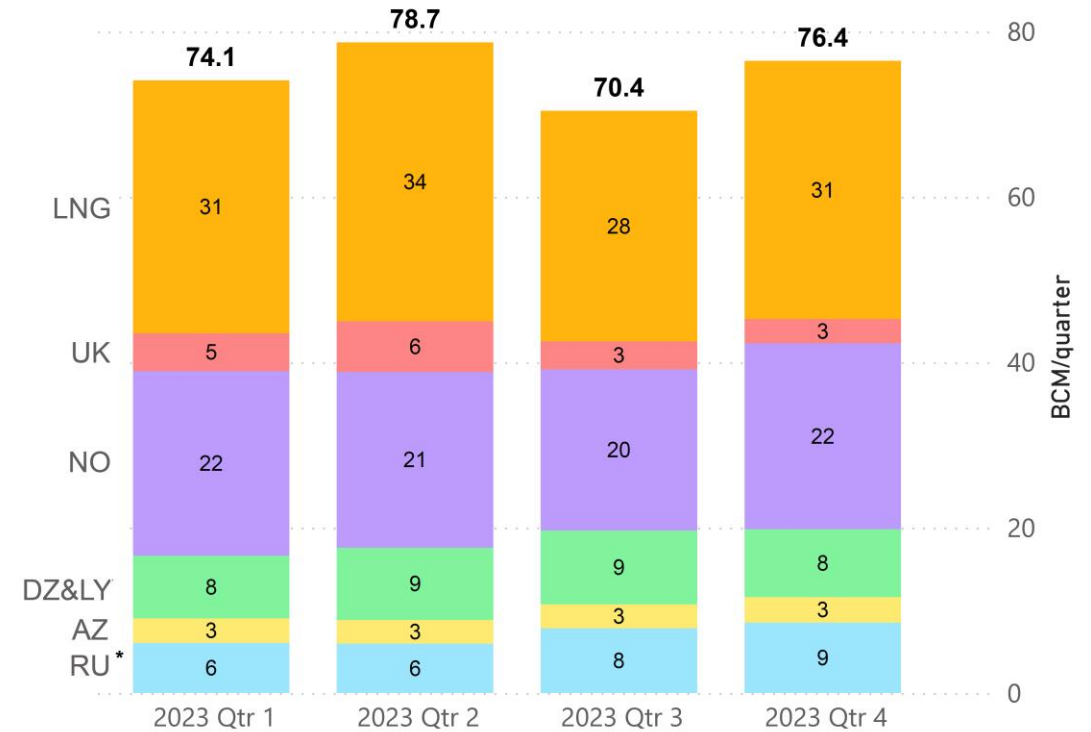
A combination of enhanced LNG supply, new gas infrastructure investments (mostly in LNG regasification) and sharply reduced gas consumption has brought a new supply-demand balance to EU gas markets, enabling the shift away from (the majority) of Russian gas pipeline supply.

# Stable pipeline supply and record volumes of LNG calmed markets

EU gas imports, 2018–2023 (bcm/day)



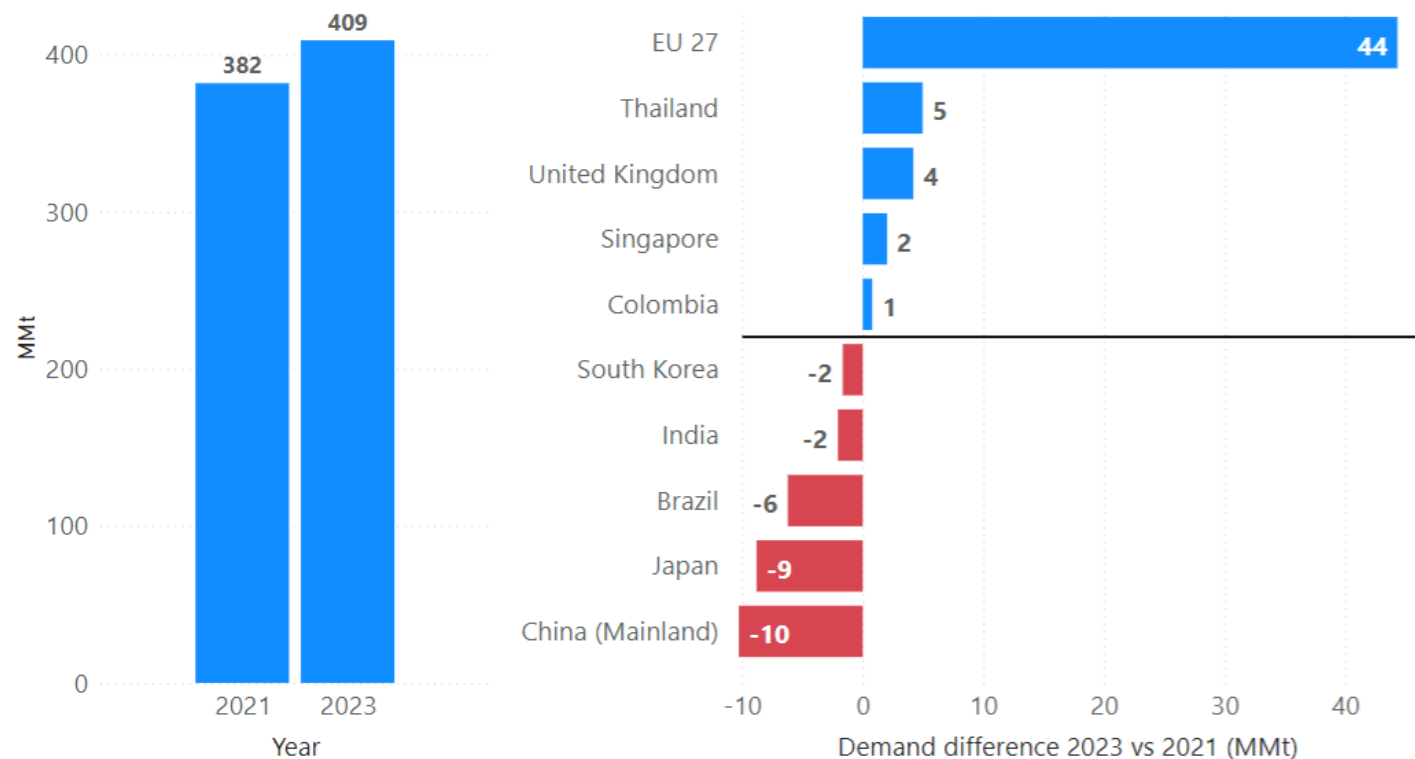
EU gas imports per source, 2023 (bcm/quarter)



In the first full year following the halt of (the majority) of Russian pipeline gas supply to the EU, total imports remained below the levels that were the norm previously. However, with relatively stable pipeline supply throughout the year, only a small year-on-year increase in LNG imports was needed for both storage and consumption demand to be fulfilled at given price levels.

# The global LNG market was still tight, but 2023 passed without high price tensions

Global LNG production (left) and relative changes in LNG imports (right), 2023 vs 2021 (million tonnes)



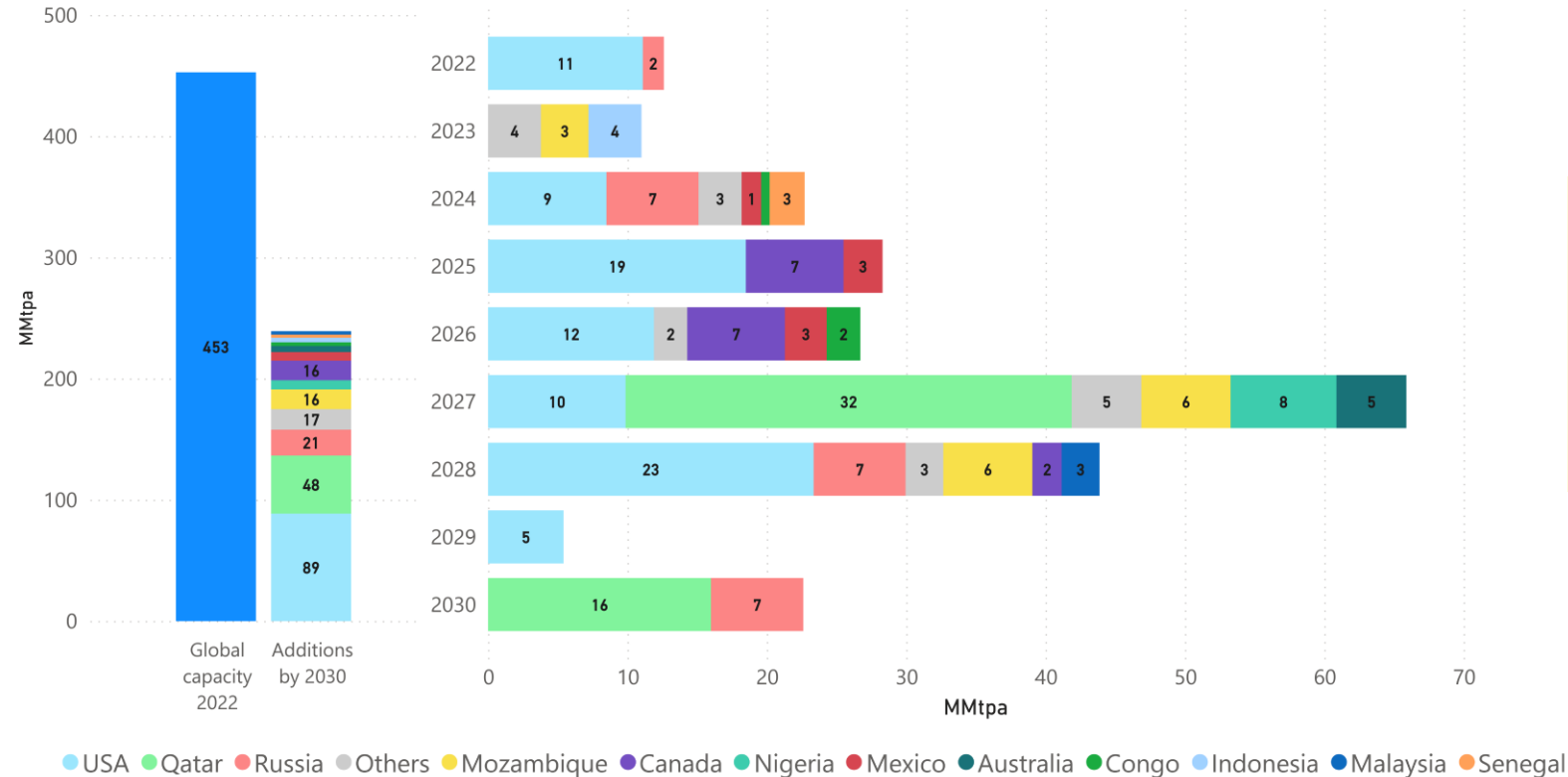
Explore LNG market trends with ACER's forthcoming European LNG MMR, due in April 2024



The EU pivot away from Russian pipeline supply and towards becoming one of the largest global importers of LNG continued in 2023 (though year on year growth of LNG imports was modest). The increase in European LNG demand has - by far - exceeded growth in global liquification capacity resulting in periods of intense price competition for LNG cargoes in 2022 and 2023. European willingness to outbid competitors, a favourable netback for American cargoes heading to Europe, and muted Asian demand have all contributed to significant LNG volumes reaching the EU.

# While rising global LNG production capacity will support price stability

**New capacity developments in global LNG liquefaction, 2022–2030 (million tonnes/year)**



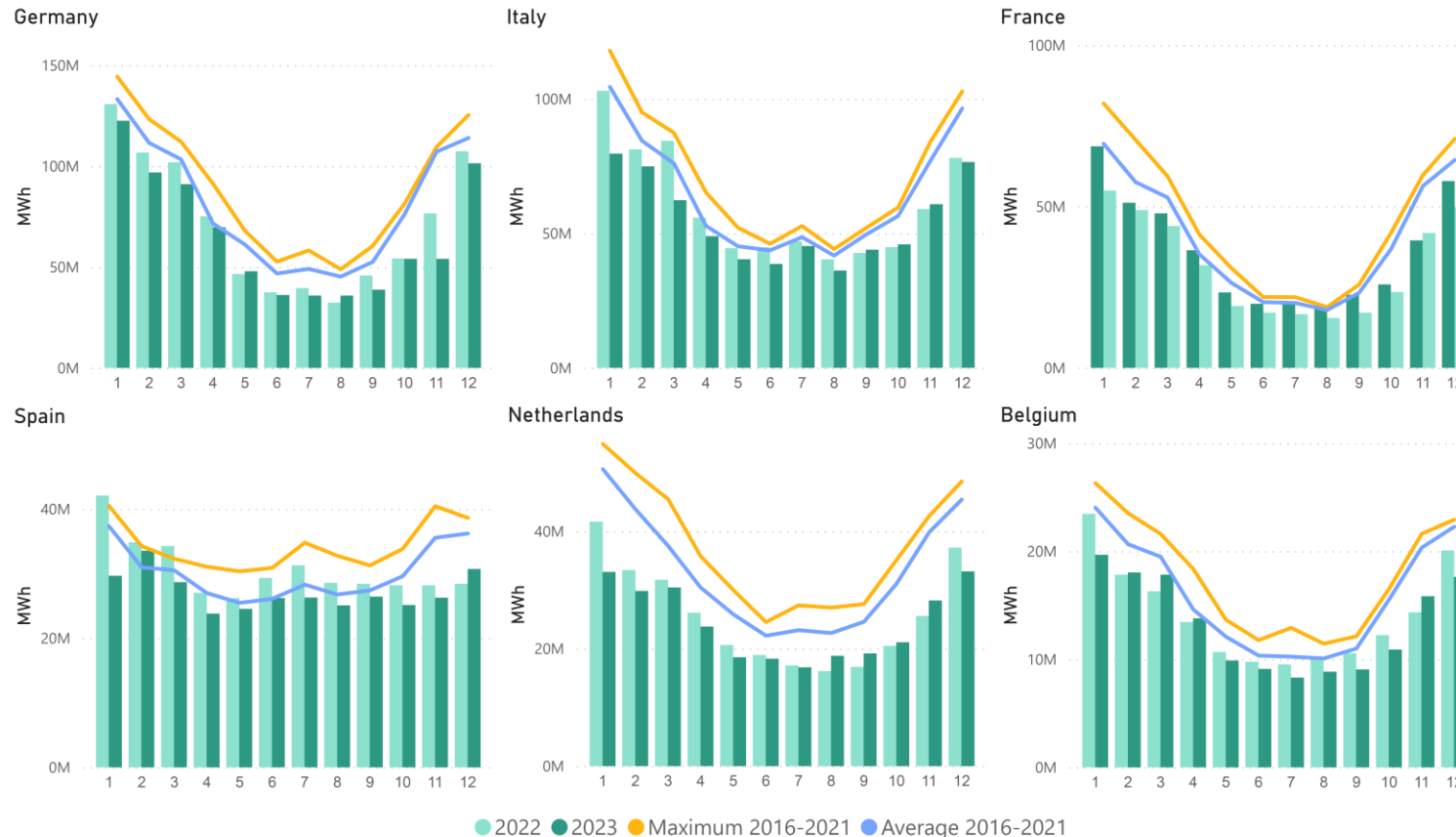
Explore the implications that the development of additional LNG production capacity might have in EU LNG contractual arrangements in ACER's 2024 LNG MMR due in April 2024.



As of February 2024, 19 liquefaction projects globally are under construction, set to boost LNG production by circa 200 million tonnes by 2030 (irrespective of the recent pause by authorities in the United States on granting new export licenses to liquification facilities). Such an increase in production capacity represents roughly half of current global traded LNG volumes and stands to reduce LNG market tightness and stabilise prices.

# The trend of low gas consumption continued in 2023

Consumption in Member States with largest natural gas demand, 2022–2023 (MWh)



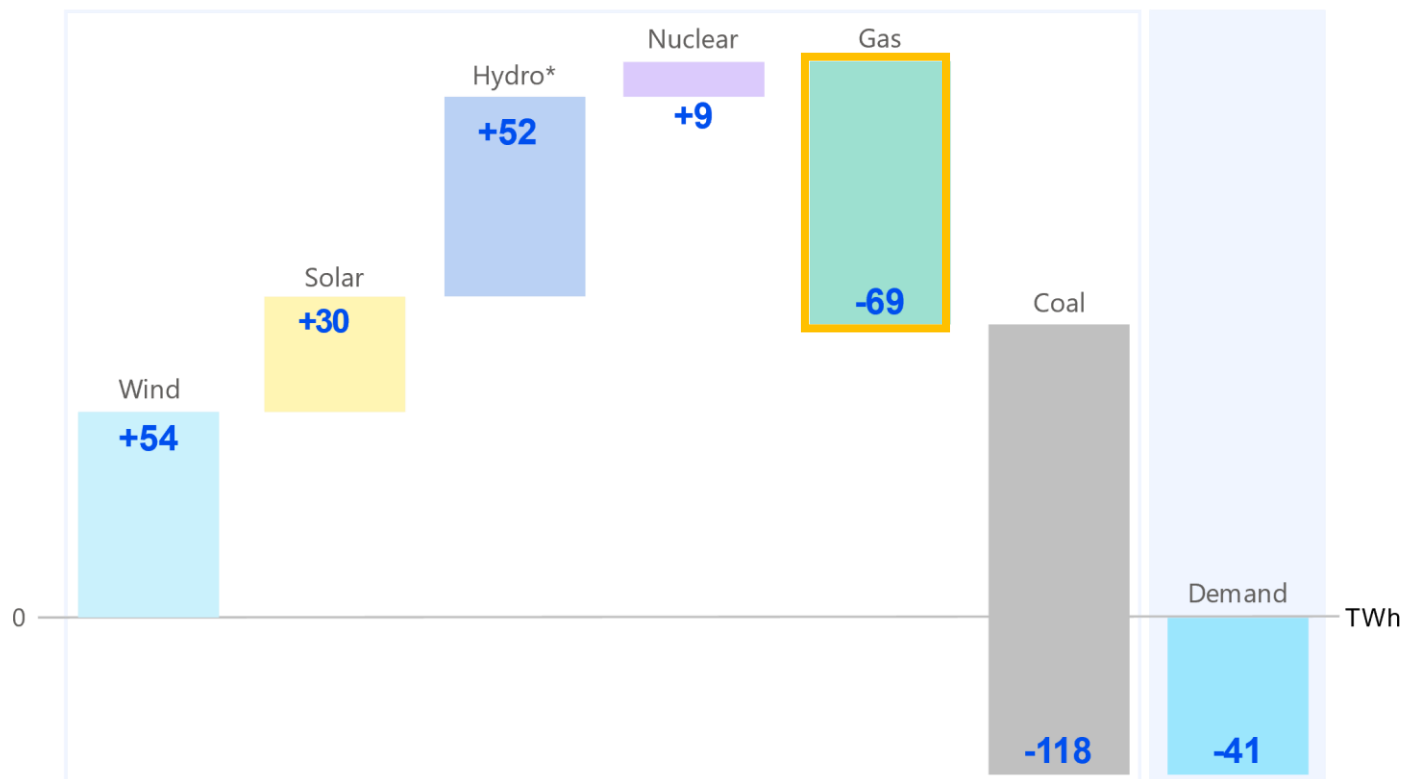
Benign weather conditions, stagnant economic activity, and growth in low-carbon electricity generation were some of the main factors that kept EU gas consumption at levels below those observed in 2022 (-8% year on year). The trend of low aggregate gas consumption continued even as prices fell. All three demand sectors — household, industrial, and gas for power generation — experienced year-on-year decreases, ranging from 7 to 10%<sup>1</sup>.



# Growth in renewables lead to lower thermal power generation

Year-on-year change for the electricity main generation technologies in the EU-27/EEA(Norway), Switzerland, 2023 (TWh)

Explore 2023 EU electricity market trends with ACER's 2024 MMR on key electricity wholesale developments



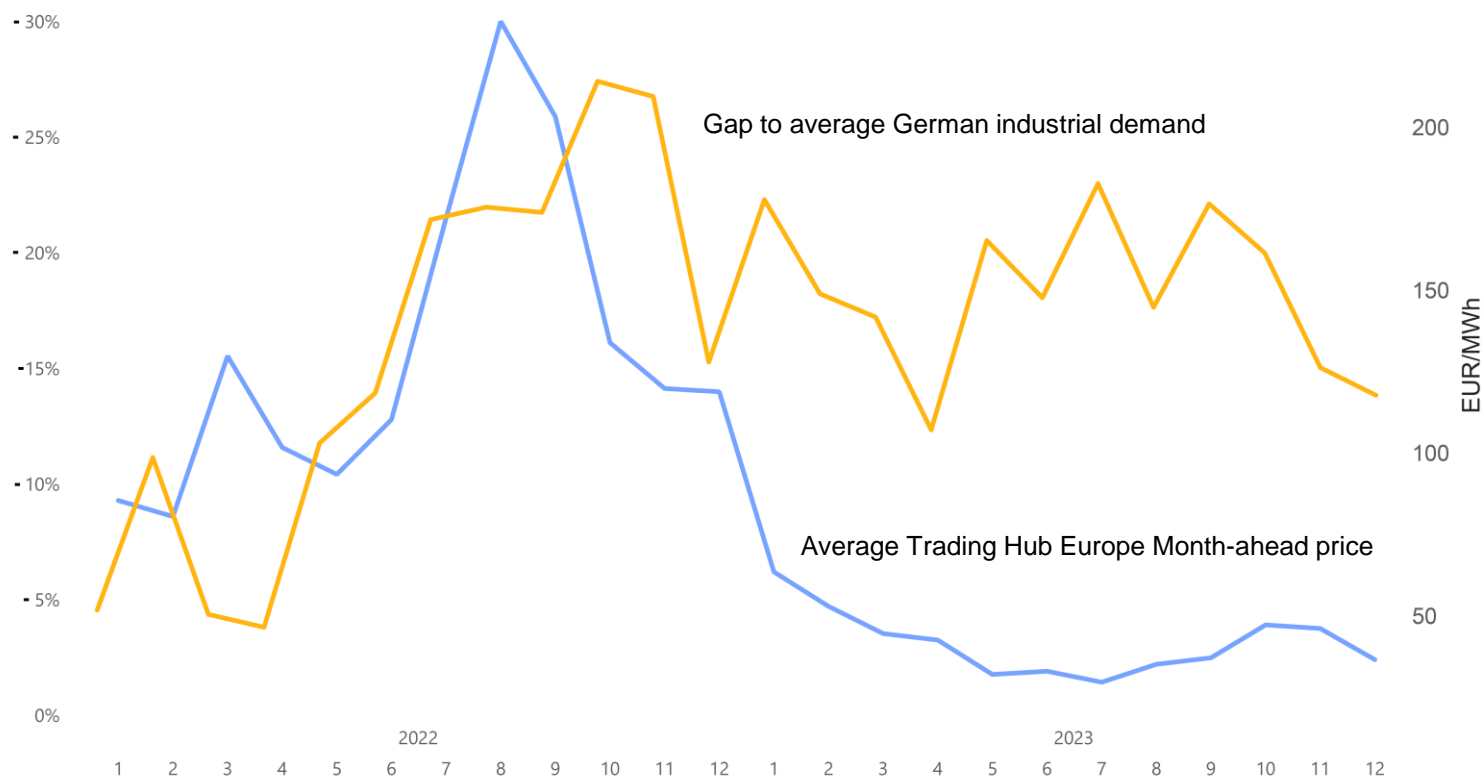
In 2022, efforts to reduce gas consumption for power generation were hampered by low nuclear, wind, and hydro generation. However, in 2023, there was an increase in low-carbon energy generation, such as solar and wind, while nuclear and hydro generation either recovered or improved. This, coupled with ongoing reductions in electricity demand (including improvements in energy efficiency), led to a significant 22% reduction in coal and gas electricity generation.

Source: ACER calculations based on European Network of Transmission System Operators of Electricity data.

Note: Hydro does not include hydro-pumped storage. Hydro-pumped storage, biomass and other generation sources were accounted for separately, with other generation sources for which the aggregated variation in generation for 2023 was zero. EEA stands for European Economic Area.

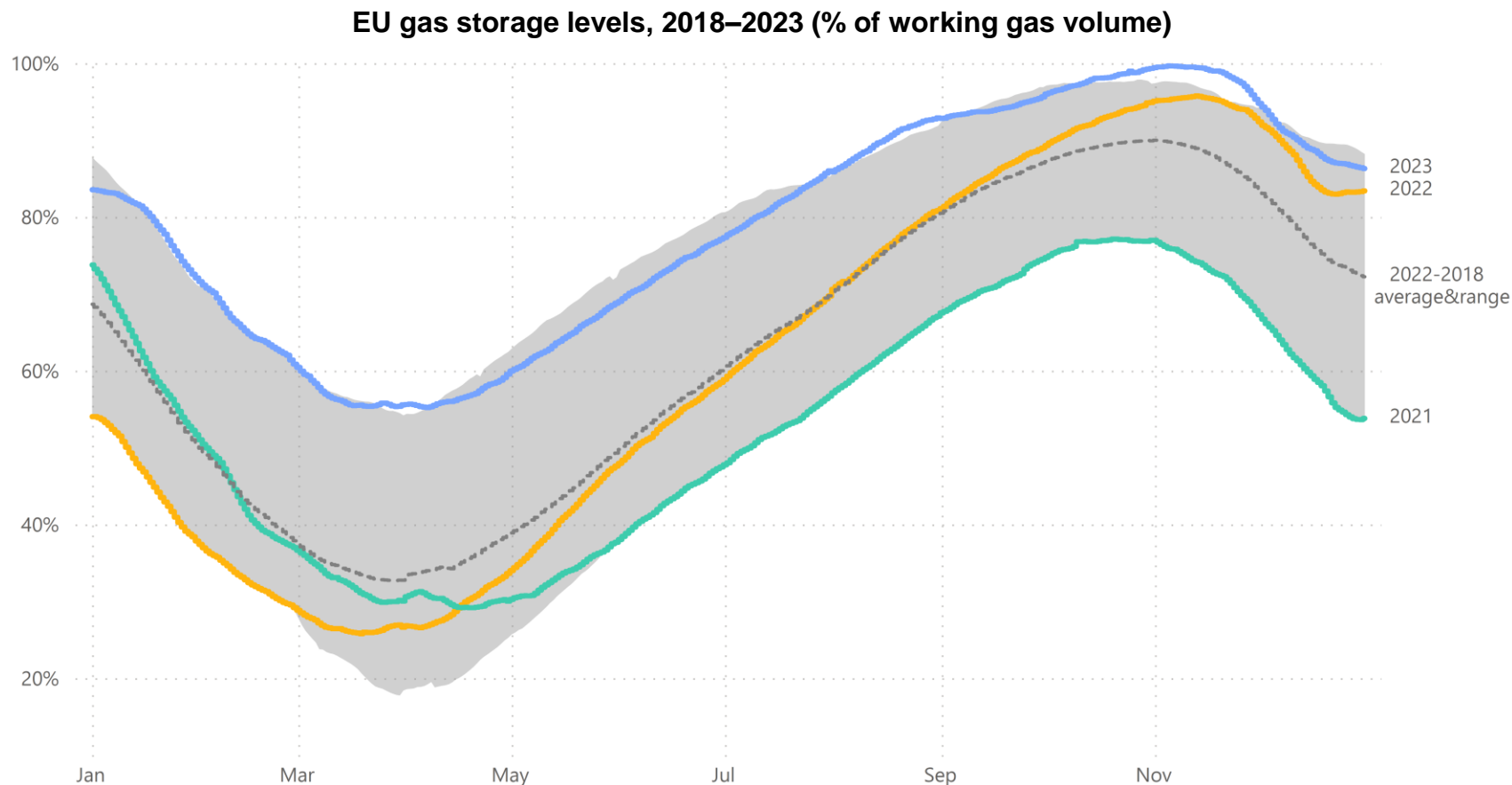
# Recovery of industrial gas consumption lagged fall of prices

Relative German industrial gas consumption (left axis) and German gas wholesale price (right axis), 2022–2023 (MWh)



European industrial gas consumption recovered from the lows recorded in the fourth quarter of 2022. However, demand remained below historical averages, even as wholesale gas prices declined. A combination of a stagnant economic activity, energy efficiency investments, electrification, relocation or closure of the most price sensitive industries and conclusion of some gas contracts before prices started to decline are all likely contributors to this outcome.

## 2023 started and finished with close-to-record levels of gas in storage



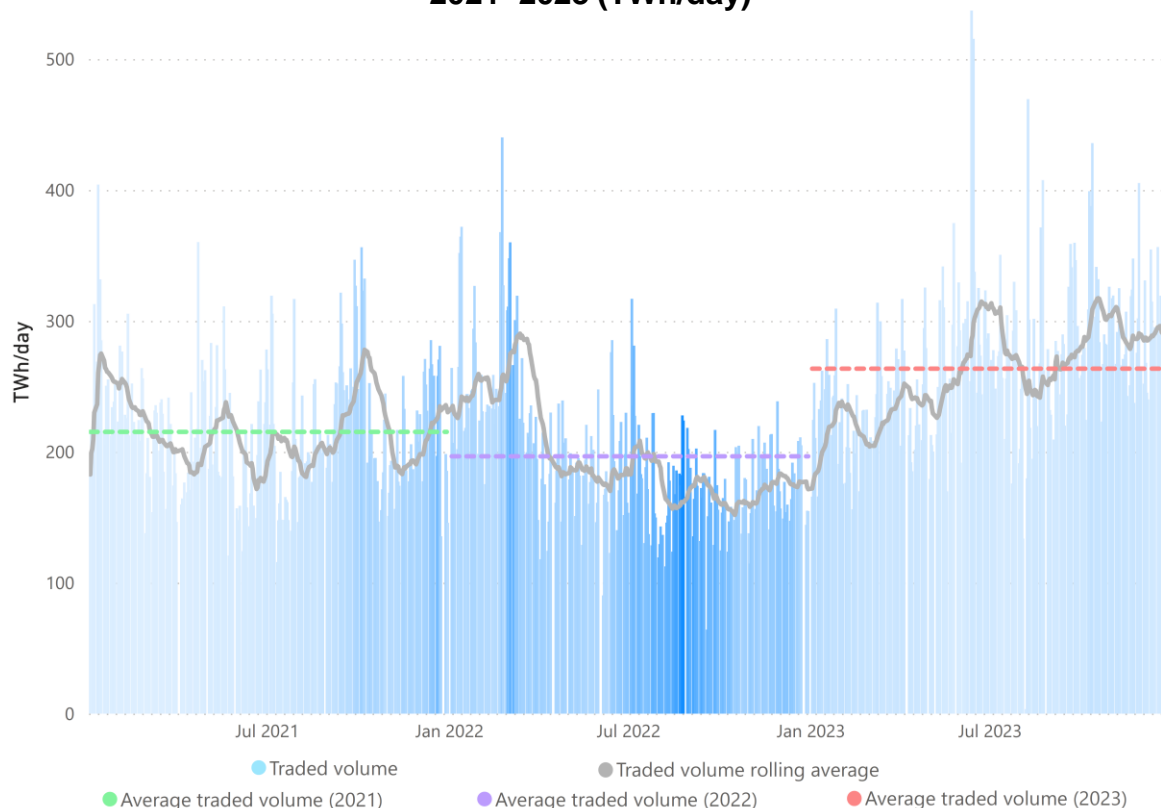
Above average gas storage stocks at the start of the year helped to dispel concerns about possible gas shortages in the first quarter of 2023. Furthermore, a relatively modest depletion of stocks during winter months required significantly less injections than in 2022 to fill storages back to EU mandated levels. Finally, throughout the summer injection season there was a strong market signal to store gas, contributing to stocks reaching nominal capacity in November.

Source: ACER based on Gas Infrastructure Europe data.

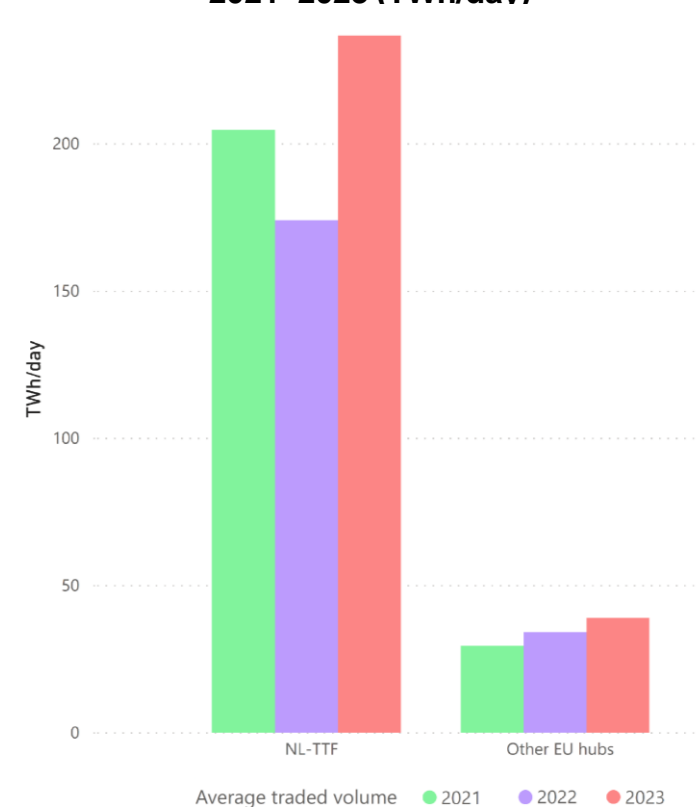
Note: The EU adopted the Gas Storage Regulation (Regulation (EU) 2022/1032) in June 2022 (amending the Security of Supply Regulation (Regulation (EU) 2017/1938)) mandating Member States to fill storage facilities to at least 80% of their capacity by 1 November 2022, and up to 90% by 1 November in subsequent years until 2025.

# Recovering trading activity highlights benefits of favourable policies

**Exchange and brokered trading volumes at EU VTPs,  
2021–2023 (TWh/day)**



**TTF and other EU VTPs traded volumes comparison,  
2021–2023 (TWh/day)**



Gas trading activity increased in 2023 in comparison to 2022. Growth was concentrated at the Dutch Title Transfer Facility.

The rise is associated with a more stable demand-supply outlook and a more favourable gas trading environment (e.g. lower relative and absolute margin requirements). Greater liquidity at gas hubs results in a more competitive and resilient EU gas market.

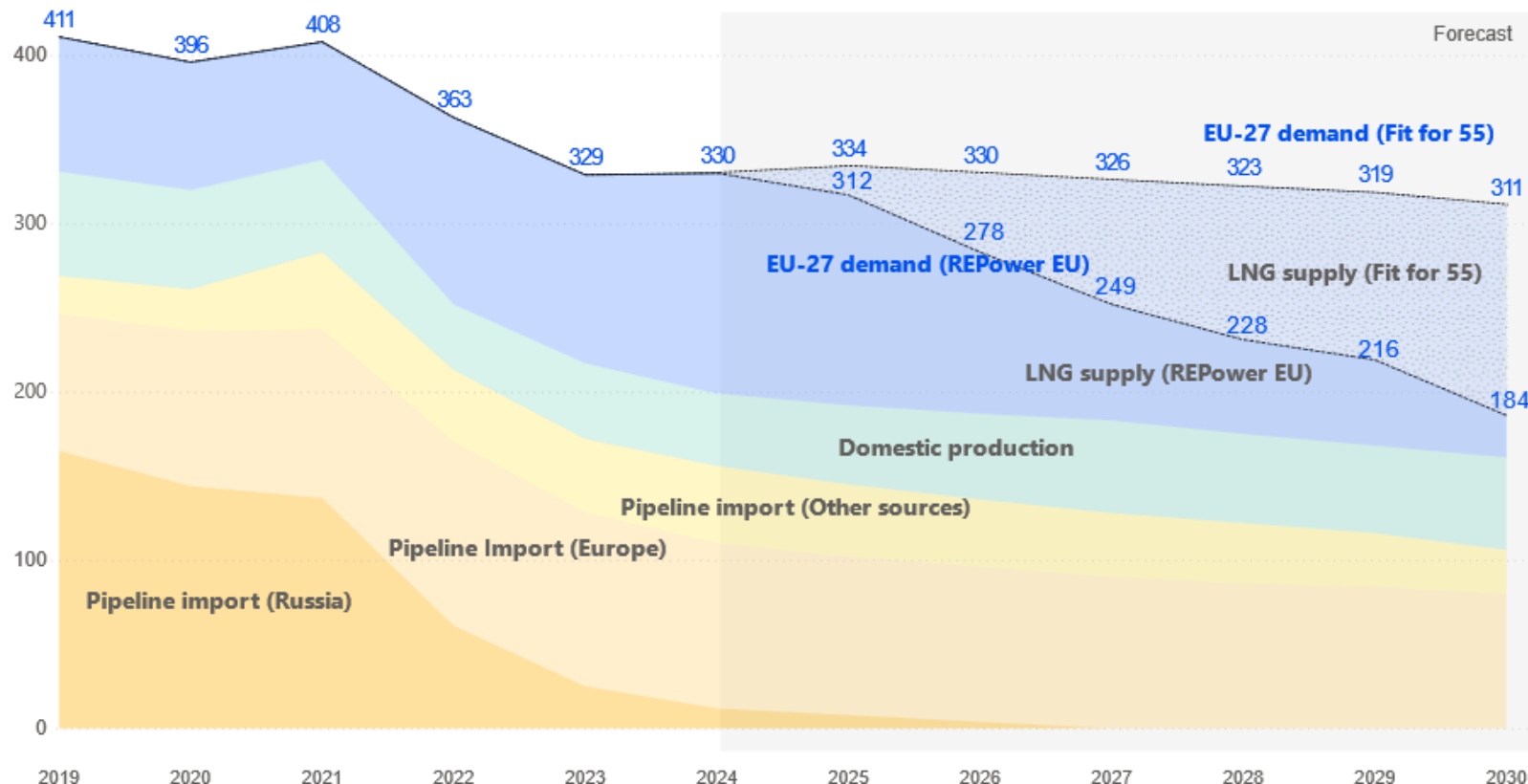
Decision-makers should consider measures that promote standard trading and reduce uncertainty.

# Select emerging EU gas market challenges

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# Future EU LNG supply needs will hinge on attained reductions in demand

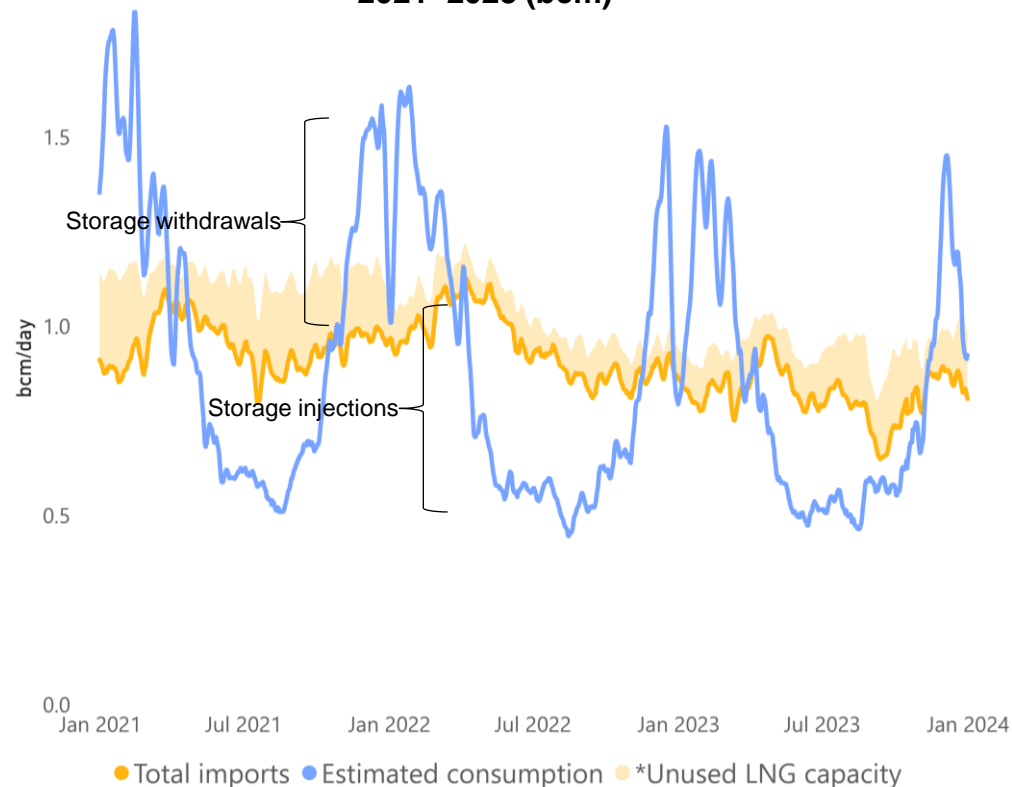
EU gas supply outlook and assessed LNG supply needs relative to FitFor 55 and RePowerEU demand scenarios – 2030 – bcm



LNG supply is expected to provide most of the flexibility to accommodate to the gradually decreasing EU gas demand, while pipeline supplies are expected to remain relatively stable although under a slight declining trend. Flexibility in long-term LNG contracts is hence essential for mitigating demand reduction risks.

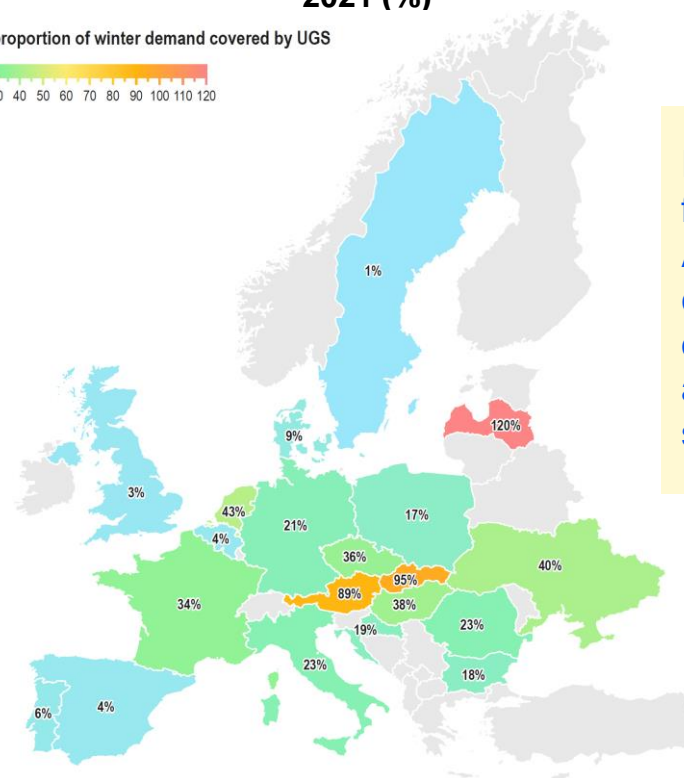
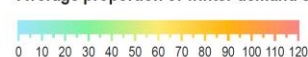
## Gas storages will remain a pillar of energy system flexibility and security of supply

EU gas consumption, total imports and \*unused LNG capacity,  
2021–2023 (bcm)



Share of winter demand covered by storage withdrawals,  
2021 (%)

Average proportion of winter demand covered by UGS



Read about the findings of the ACER-CEER consultancy studies on the impact of EU and national gas storage regulations



Even as the decarbonisation and the electrification of the energy system progress, alternatives to gas storage for the provision of seasonal flexibility have yet to mature and scale. Therefore, in terms of security of supply — and consequently market stability — gas storages play an invaluable role in Europe. The energy crisis showed that gas storage missteps can be extremely costly, highlighting the importance of coordinated, efficient storage regulatory frameworks.



## Persisting EU gas price differentials carry implications

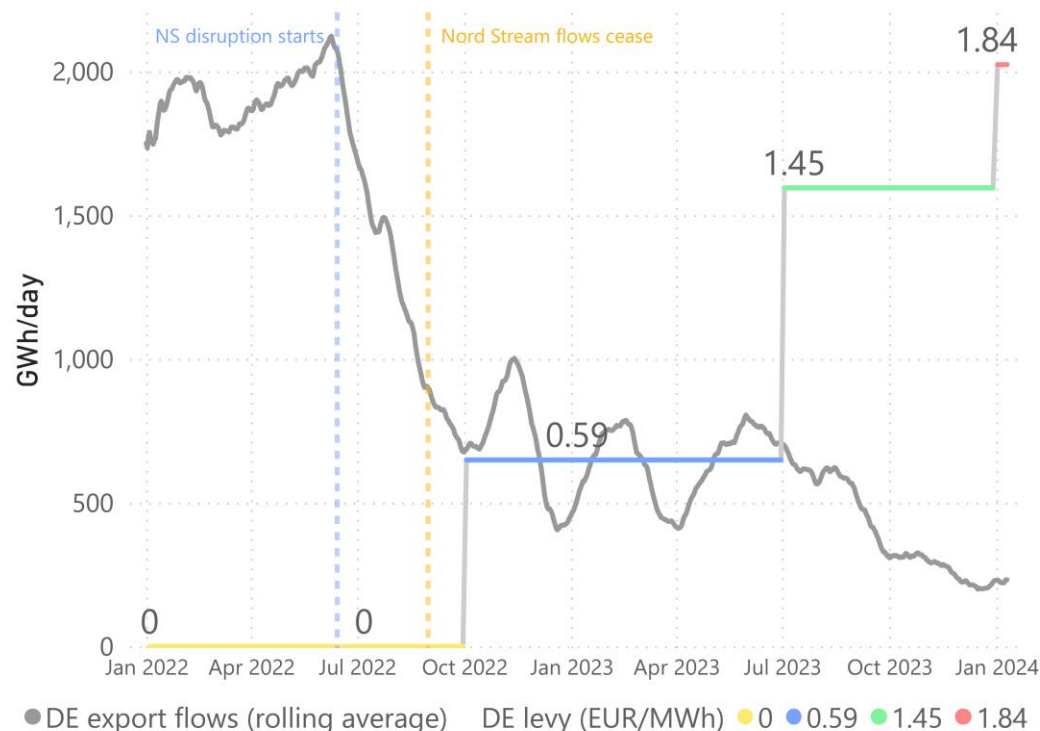
Overview of natural gas price international benchmarks, February 2024 (dollar/mmbtu)



If Europe wants to effectively address the implications of global gas price differentials not least vis-à-vis North America, attention shifts to other EU advantage factors, such as enhanced market integration and resources sharing<sup>1</sup>.

This is given continuous subsidisation of energy input factors is likely to prove fiscally extremely challenging. This challenge is compounded by the fact that gas still covers circa twice the energy needs met by electricity across the EU, at lower nominal energy price and transport costs.

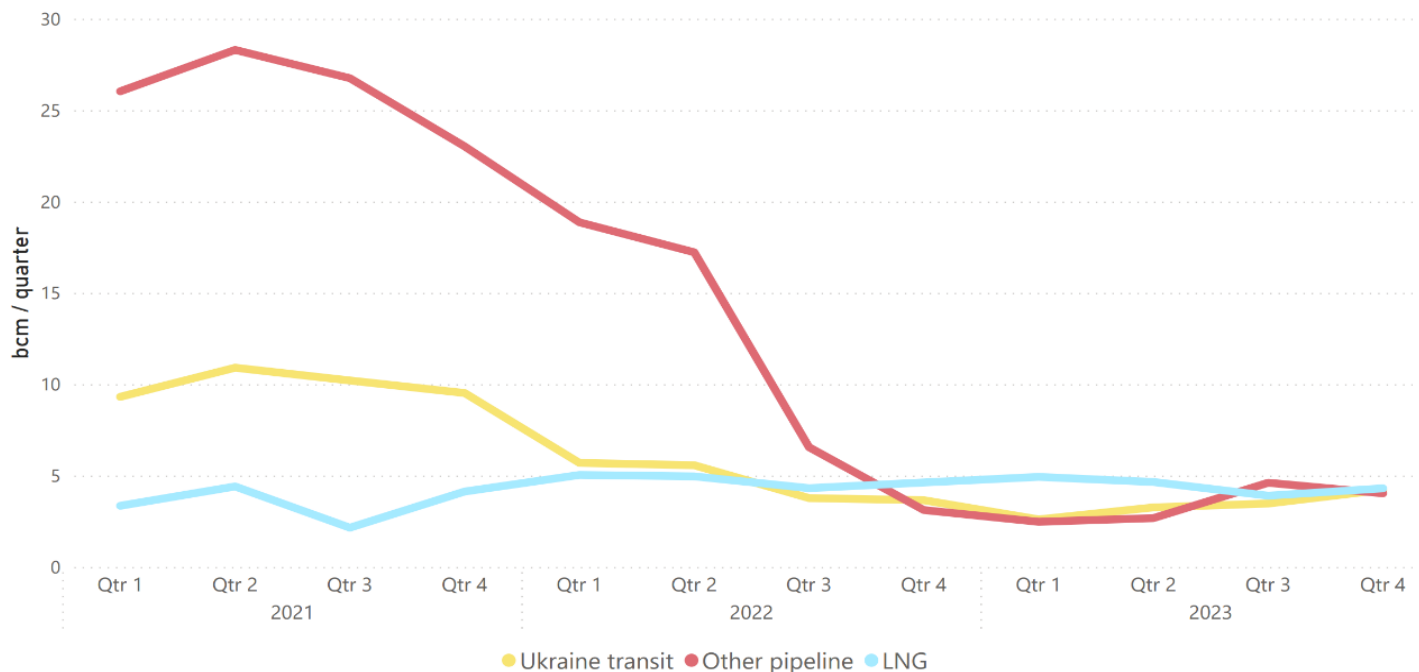
## German exports flows (aggregate) and gas storage levy evolution, July 2022–January 2024 (GWh/day and EUR/MWh)



The increased EU reliance on LNG will prompt adjustments in cross-border flows, underscoring the need to promote seamless transmission. However, some recently introduced uncoordinated national measures that increase the cost of gas cross-border trade risk disrupting smooth gas flows. These give rise to concerns about certain gas market fragmentation and hub price convergence being hampered. More coordinated approaches hence need to be promoted.

# Ukraine gas transits' expiry carries some consequences

Overview of Russian pipeline and liquified gas supplies to the EU, 2021–2023 (bcm/quarter)



The Ukraine-Russia gas transit agreement is due to expire at the end of 2024, and Ukrainian authorities have referred that they won't renew it. In 2023, both Ukraine and TurkStream transits delivered each around 14 bcm, while Russian LNG deliveries accounted to circa 20 bcm (a large part, intended for reloads<sup>1</sup>). EU Member States are implementing contingency plans to manage potential supply disruptions<sup>2</sup>. Furthermore, Ukraine faces implications if the cessation of Russian transit flows impedes its capacity to procure gas from neighbouring EU Member States through virtual flows. This could impact the use of Ukraine's extensive storage facilities<sup>3</sup>. This scenario makes even more pressing the need of coordinated measures not to rise transport costs and endanger transit flows.

Source: ACER calculations based on European Network of Transmission System Operators data.

Note 1: A substantial part of Russian LNG deliveries to the EU is then reloaded to non-EU countries (30 to 35%, in accordance with some educated guesses).

Note 2: e.g., Slovakia and Austria would be most affected. In Austria suppliers need to demonstrate a gradually increasing share of non-Russian gas. That can be done by procuring it via the AggregateEU joint purchasing platform, as an example.

Note 3: Under the current arrangements, some of the transit volumes to EU companies were injected into storage. If there is no transit, all gas would be physically imported from neighbouring EU countries into Ukraine.

# Conclusion

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Quarterly Gas reports



Electricity and gas  
markets dashboards



April: Analysis of the  
European LNG market



March: Key electricity and  
gas wholesale developments

**In 2023, the EU gas system consolidated the notable changes** initiated in 2022 to reduce reliance on Russian supply through increased LNG imports and demand reduction.

**However, these changes bring new challenges and implications for the future**, such as the need to safeguard competition as the EU reliance on LNG heightens, and possibly some amplified volatility until new global LNG production stabilizes prices. Additionally, the surge in LNG supply has led to flow reconfigurations, which are at risk of being affected by uncoordinated national measures rising cross-border transportation costs. Amidst these changes, the market is evolving to incorporate larger volumes of decarbonized gases, while overall remaining to ensure EU's seasonal energy supply through vast storage capacities.

**ACER's recent efforts** focus on addressing these challenges, with priorities including LNG market monitoring and its impacts on competition and hydrogen market framework enhancement. ACER plans to provide detailed overviews of EU energy market performance in 2023 and 2024, publishing various quarterly reports that highlight the need for adapting to build resilience and enhancing integration to navigate future challenges



September: Energy  
retail monitoring



October: Security of  
electricity supply report



October: Progress of  
EU electricity wholesale  
market integration



November: Analysis of the  
European hydrogen market



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