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European Union Agency for the Cooperation of Energy Regulators

Key developments in European gas wholesale markets

2024 Market Monitoring Report

22 October 2024

Report in PowerPoint format

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About this report

The report provides an overview of **EU wholesale gas markets trends in the third quarter of 2024**.

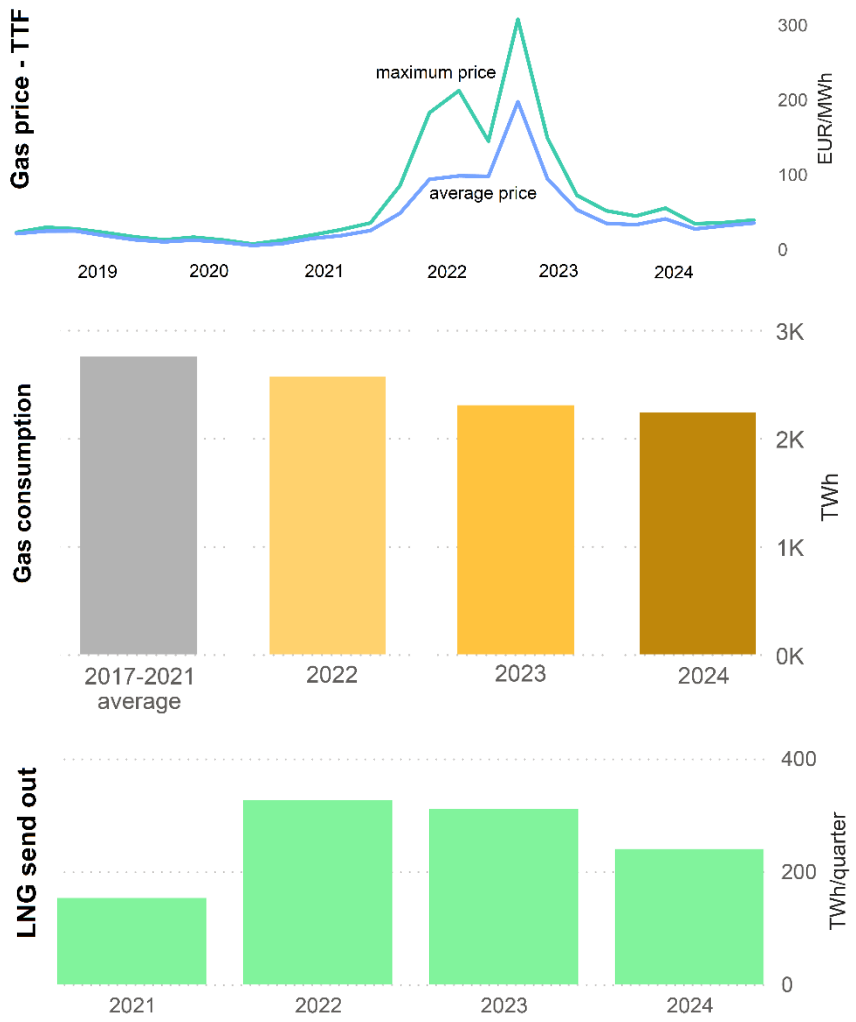
Specifically, it addresses:

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

It also includes considerations about the evolution of gas transmission tariffs and their effects on wholesale price formation.

Explore the market monitoring section of the ACER website for additional information about European energy markets.

Key numbers of EU gas wholesale markets in Q3 2024



33.5 EUR/MWh: Average TTF price in Q2&Q3 of 2024

While prices have increased since the start of the year, they have been lower, on average, then in 2023. Price volatility has noticeably moderated.

-69 TWh: Gas consumption decreased year-to-date* compared to 2023[1]

Lower gas burn for power generation and stagnant household demand more than outweighed the minor increase in industrial gas demand in 2024 so far.

94%: Gas storages were almost full at the end of Q3

Despite slow injections in Q3, storages were above the 90% November target several weeks ahead of the deadline boosting security of supply and helping stabilise prices.

-23%: Decrease of LNG imports in Q3 of 2024 compared to 2023

As demand from other LNG importing regions increased, an otherwise balanced European gas market saw EU buyers shy away from competing for higher priced spot cargoes. Deliveries are expected to increase with the onset of peak gas consumption season.

Source: ACER based on ICIS, Gas Infrastructure Europe (GIE) and Eurostat data.
Note 1: All comparisons against 2023 relate to the same period referred for 2024. *January to August period.
LNG stands for liquified natural gas. TTF stands for Title Transfer Facility, the virtual gas trading point in the Netherlands used as benchmark for EU natural gas prices.

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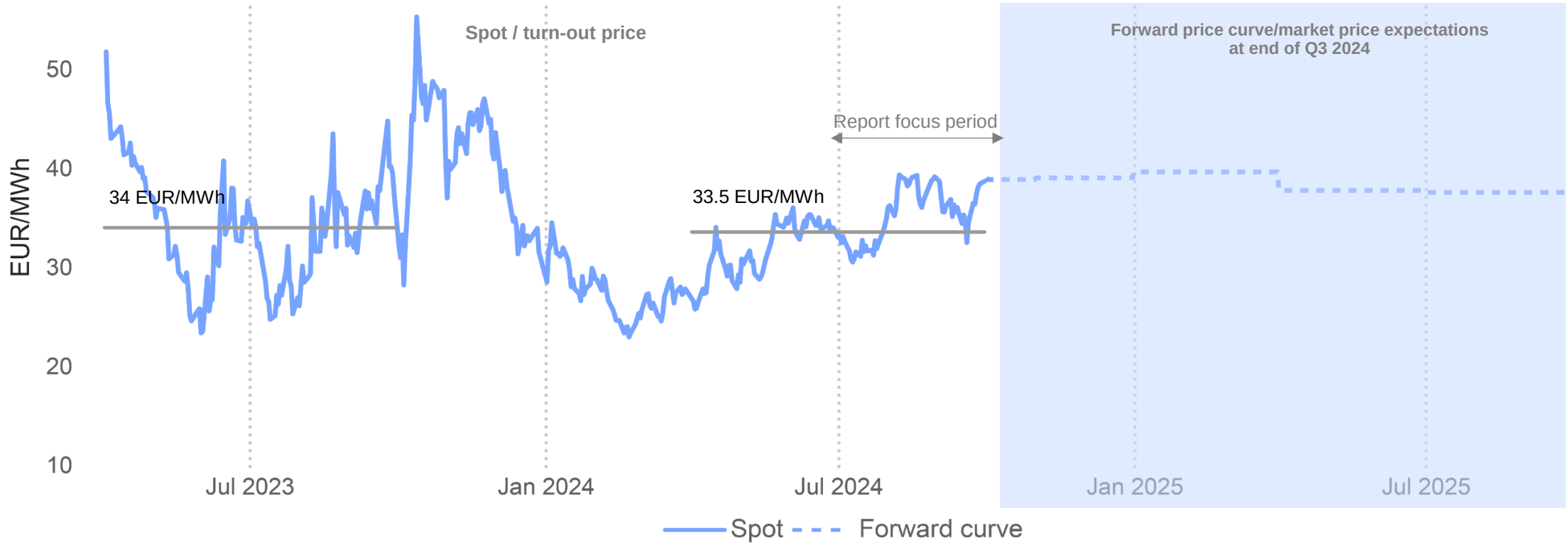
Gas wholesale markets in the third quarter of 2024

Prices, hub convergence, and trading activity

Prices rose, but were lower and less volatile than last year

Natural gas price turn-out (TTF day-ahead) and market price expectation (TTF basket of forward products), April 2023-October 2025 (EUR/MWh)

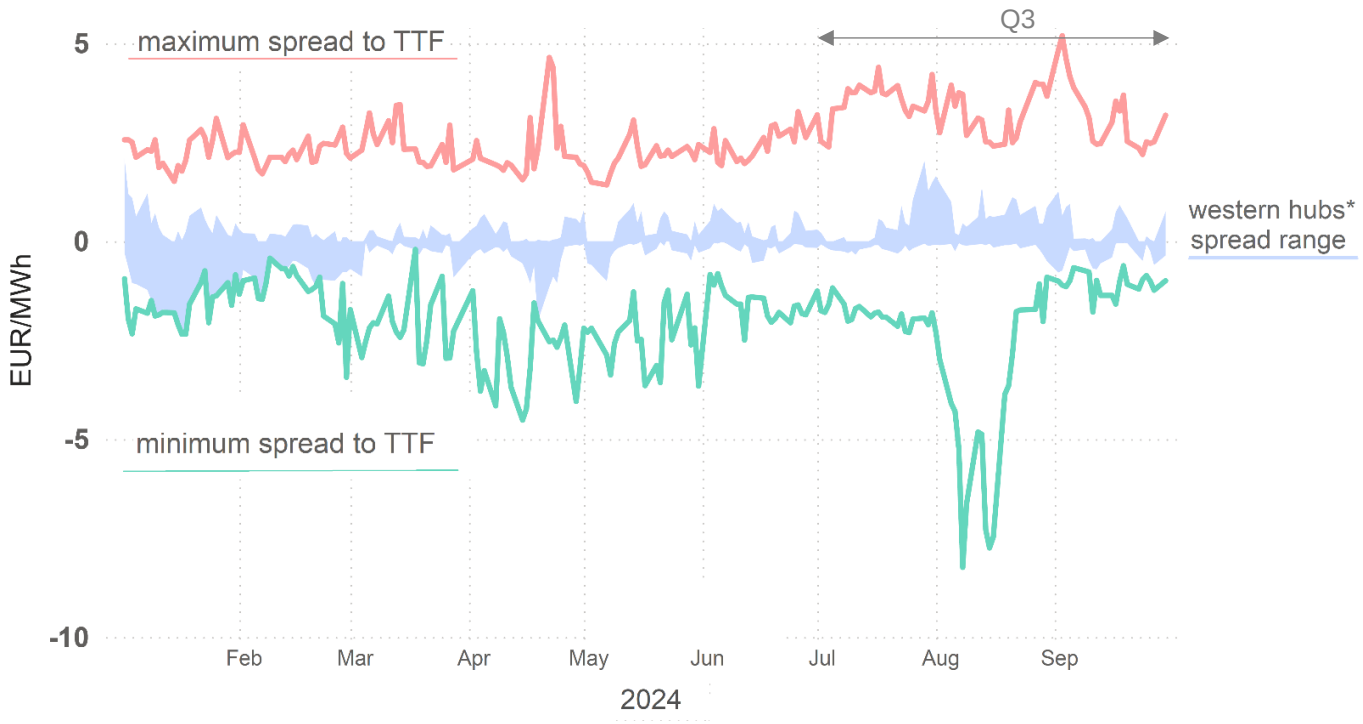


Gas prices increased over the second and third quarter of 2024 but remained marginally lower and considerably less volatile than last year. Greater availability of Norwegian supply, a comfortable storage position and continued tepid European demand acted as counterweights to a tighter global LNG market due to rising global gas demand, geopolitical tensions and the growing precariousness of residual imports of Russian gas transited via Ukraine.

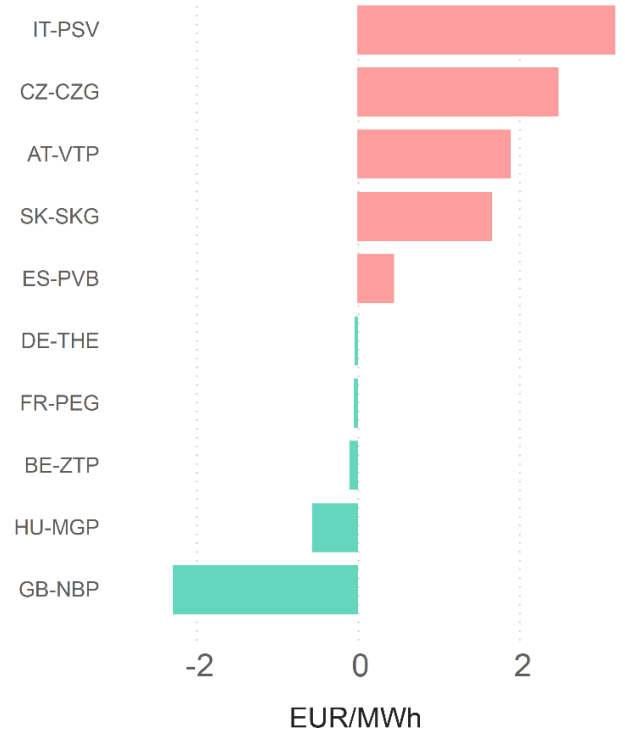
Source: ACER based on ICIS.
Note: LNG stands for liquified natural gas. TTF stands for Title Transfer Facility, the virtual gas trading point in the Netherlands used as benchmark for EU natural gas prices.

Prices were uniform across most but not all EU gas hubs

Range between hubs with cheapest and most expensive spot price, January-October 2024 (EUR/MWh)



Average spread to TTF, Q3 2024 (EUR/MWh)



Similar fundamentals, good interconnectivity and low variable costs of cross border trade contributed to price convergence at western European gas hubs over the third quarter of 2024. In contrast, those markets where gas transported through Germany plays an important role in price formation experienced divergence as the German storage levy increased.
Strong supply to and limited export capacity pushed Hungarian prices to the lowest amongst the assessed EU hubs.

Source: ACER based on ICIS.
Note: LNG stands for liquified natural gas. The listed hubs correspond to Austria, Belgium, Czech Republic, France, Germany, Hungary, Italy, Slovakia, Spain and United Kingdom Virtual Trading points.

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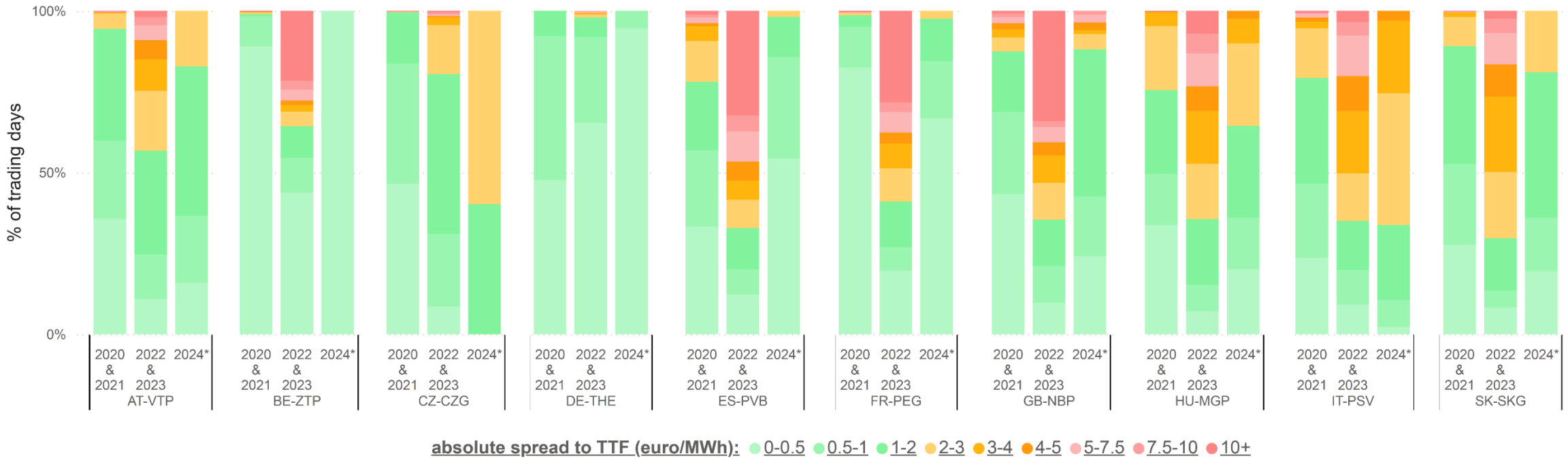
Additional transportation costs may be hindering integration

Natural gas price hub convergence, 2020-Q3 2024 (% of trading days with spreads in the price range (selected hubs vs TTF, day-ahead contract))

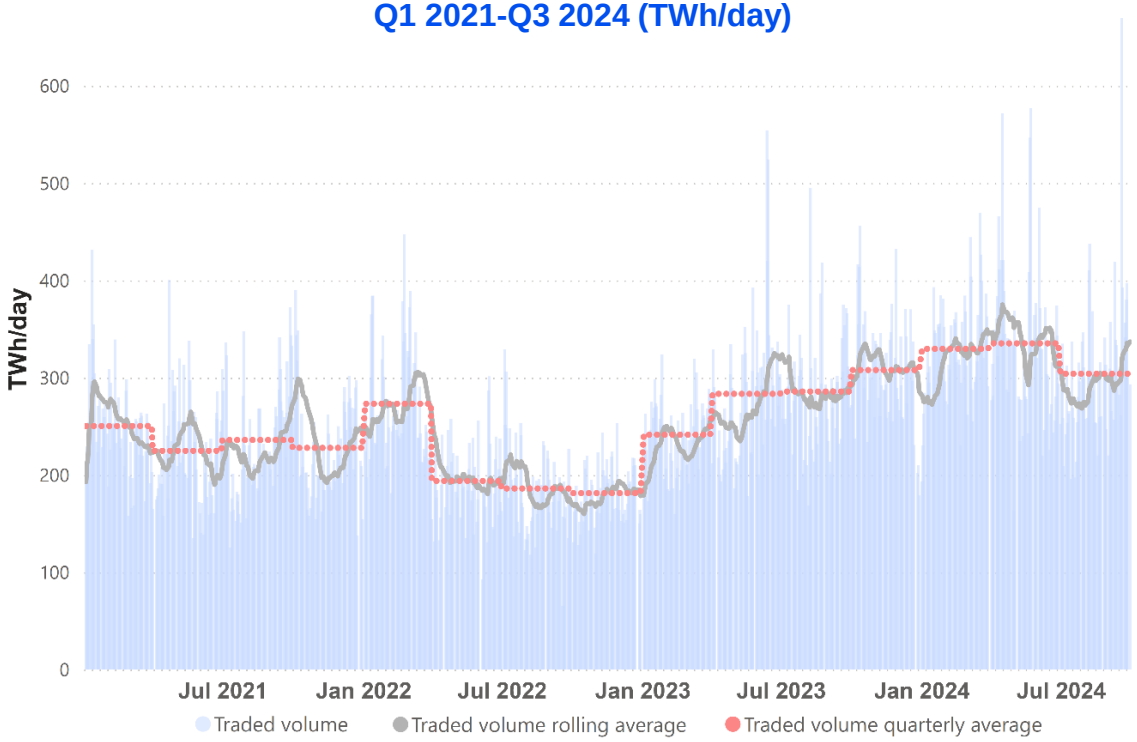


The convergence of hub prices has improved since the peak of the 2022 energy crisis, but market integration has not yet returned to pre-crisis levels among all EU markets. While price formation in gas markets results from the interplay of various demand and supply drivers, on average, higher premiums are observed in 2024 in markets that have seen additional transportation charges introduced on their important supply routes.

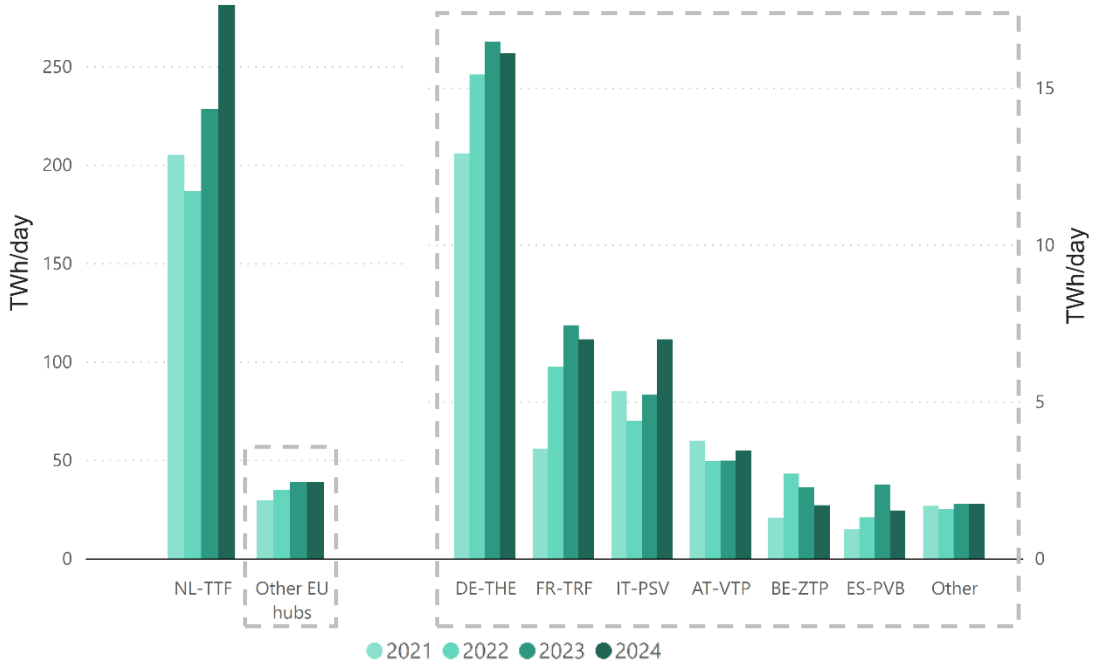
Source: ACER based on ICIS. Note: The analysis highlights absolute hub price spread differences but does not specify which hub is at a premium or discount. Historically, the NL-TTF hub has typically set the lowest price reference. However, since mid-2022, LNG reliant and less congested hubs such as FR-PEG or SP-PVB have often quoted at a (relevant) discount. This shift accounts for the relative increase in 'red price ranges' in the graph, while indicating that French or Spanish hub prices were often at a discount.

Trading activity saw first quarter-on-quarter fall since 2022

Trading volumes at EU VTPs, Q1 2021-Q3 2024 (TWh/day)



TTF and other EU VTPs traded volumes comparison, Q1-Q3 2021-2024 (TWh/day)



Liquid trading hubs allow market participants to effectively manage price risks associated with gas supply making them a key component of the EU gas market. Gas trading activity grew strongly in the first half of 2024, with most of the increase related to products for delivery at the Dutch TTF. In Q3 volumes were up year-on-year but the trend of quarter-on-quarter growth has been interrupted. EU gas markets' liquidity is at healthy levels and has improved since the peak of the energy crisis on measures such as bid-ask spread while energy exchanges are reporting record open interest.

Source: ACER based on REMIT.
Note: The analysis considers volumes traded via exchanges or brokers. TTF stands for Title Transfer Facility, the virtual gas trading point in the Netherlands. VTPs stands for Virtual Trading Points. The bid–ask spread is the difference between the prices quoted for sale and purchase for a contract. Open interest refers to the total number of outstanding derivative contracts that have not been settled.

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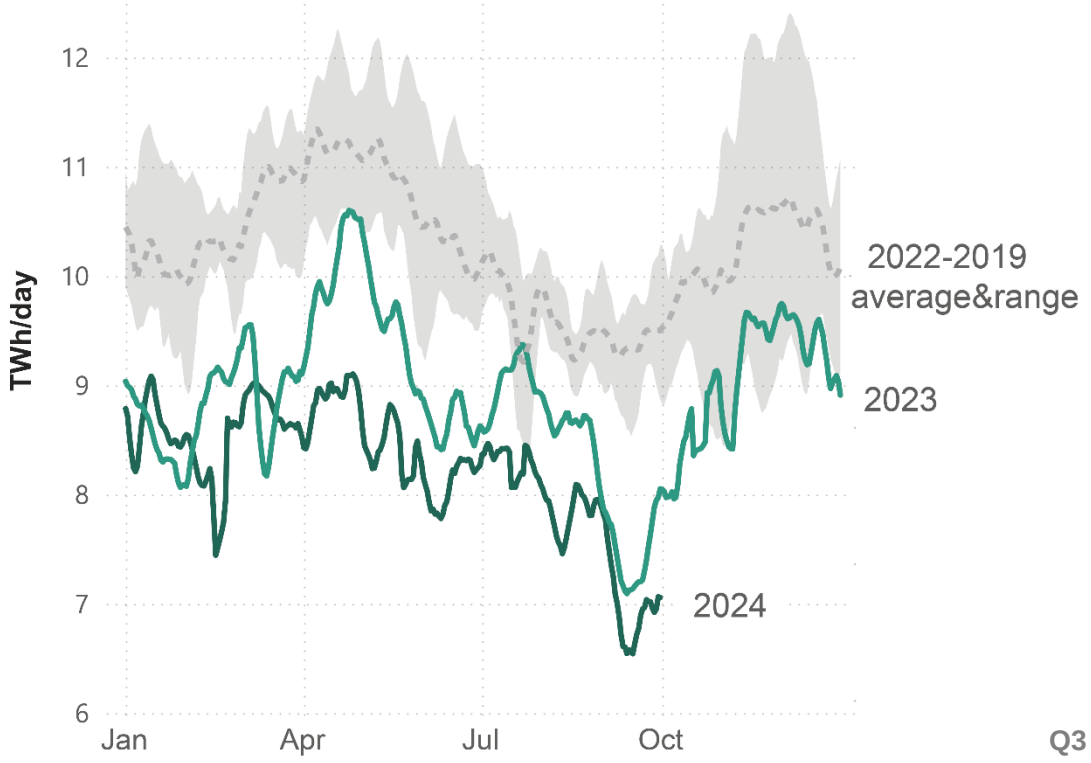
Gas fundamentals in the third quarter of 2024

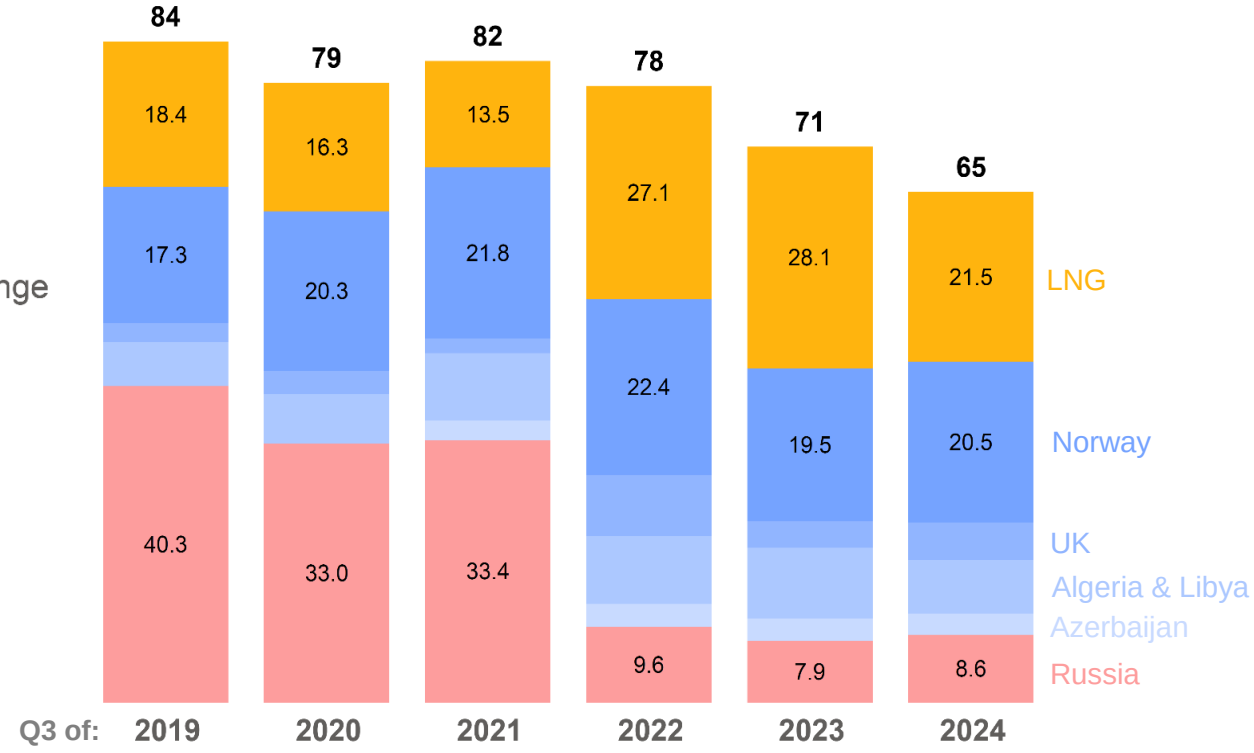
Supply, demand, and LNG

EU gas imports continued to fall in Q3

EU pipeline and LNG import flows, 2019-2024 (TWh/day)



EU gas imports per source, Q3 2019-2024 (bcm)

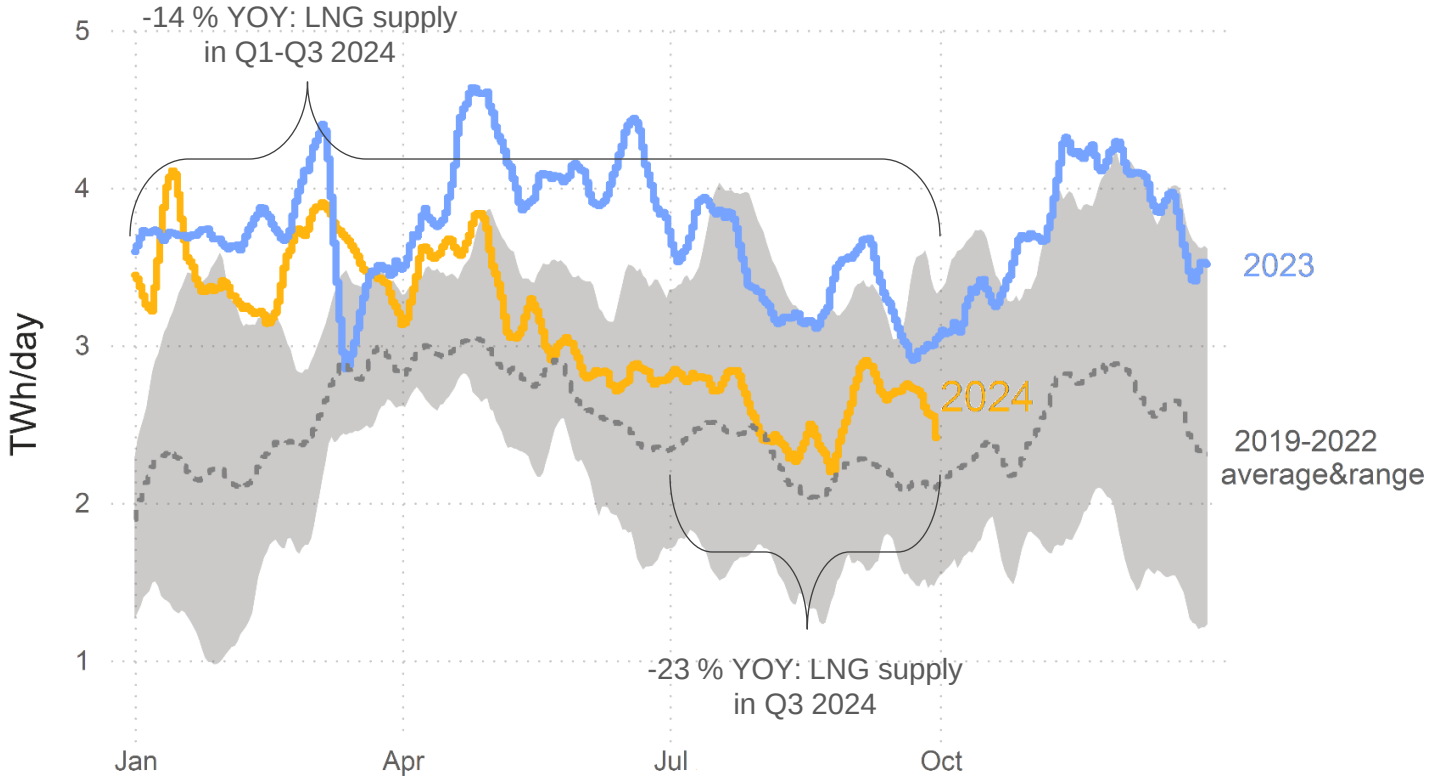


A lighter program of gas infrastructure maintenance on the Norwegian continental shelf boosted supply from Norway (including via the UK) compared with the third quarter of 2023. Russian flows transported via Turkey (TurkStream) and Ukraine also increased marginally year-on-year. However, a substantial reduction in LNG imports – an ongoing trend since Q2 2024 – meant that overall gas imports decreased year on year.

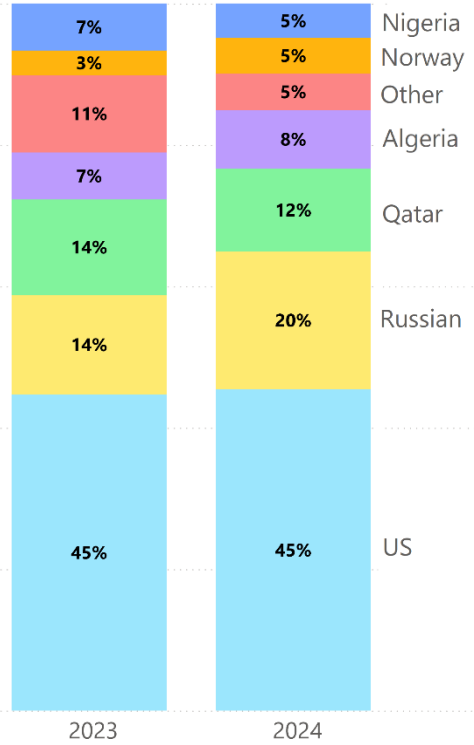
Source: ACER based on Gas Infrastructure Europe and European Network of Transmission System Operators Gas transparency platform data.
Note: Values in the figure 'EU gas imports' are seven day rolling averages.

LNG arrivals lifted at end of quarter but trailed behind 2023

EU LNG send-out, 2019-2024 (TWh/day)



Origin of EU LNG imports and share of total, Q1 – Q3, 2023-2024 (%)

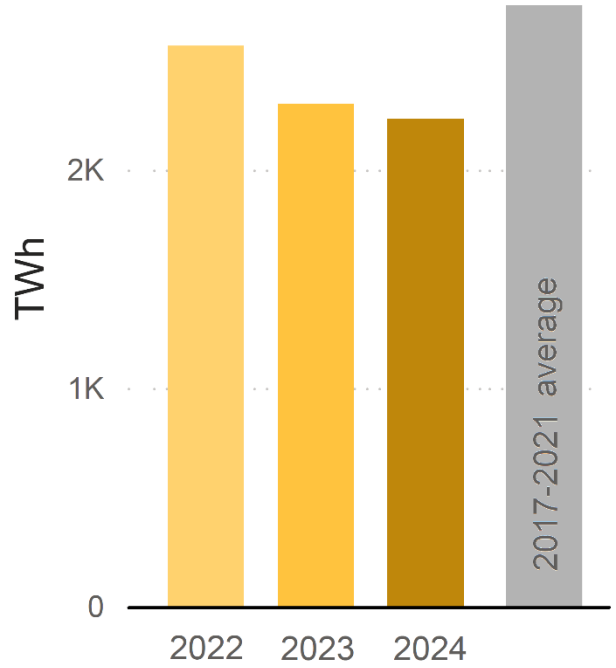


EU LNG imports registered the lowest quarter since Q4 2021, despite improved production of the super chilled fuel (up 3% globally compared to Q3 2023). The EU share of the global LNG import market shrank to 18% from 24% in Q3 2023. While demand from other LNG importing regions increased, an otherwise balanced European gas market saw EU buyers shy away from competing for higher priced spot cargoes.

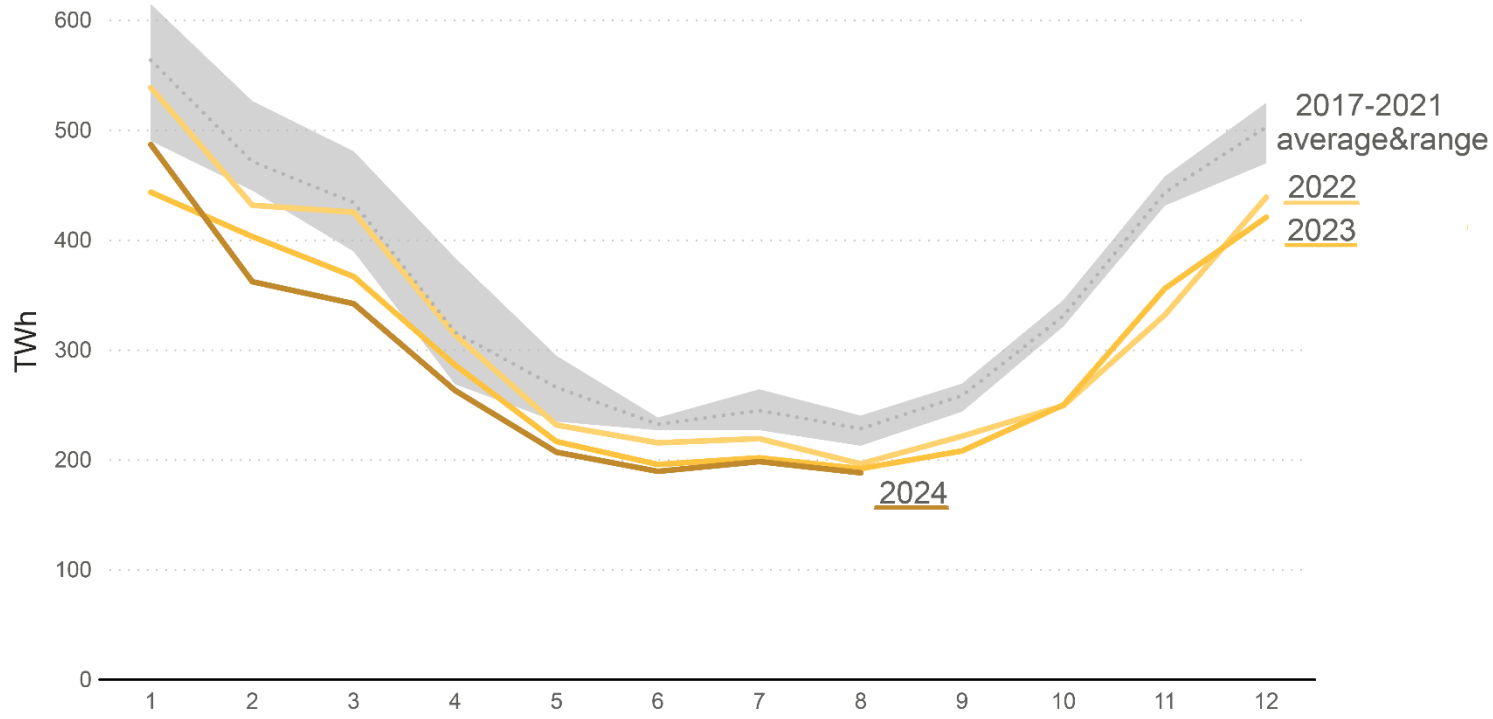
Source: ACER based on Gas Infrastructure Europe transparency platform and Platts data.
Notes: Values in the figure 'EU LNG send-out' are seven day rolling averages. Values in the figure 'Origin of EU LNG imports and share of total' refer to gross imports, a significant volume of LNG originating from Russia is re-exported from the EU to other markets.

The decline of EU gas consumption moderated in Q3

EU gas consumption, January-August, 2017- 2024 (TWh)



EU gas consumption, January 2017-August 2024 (TWh)

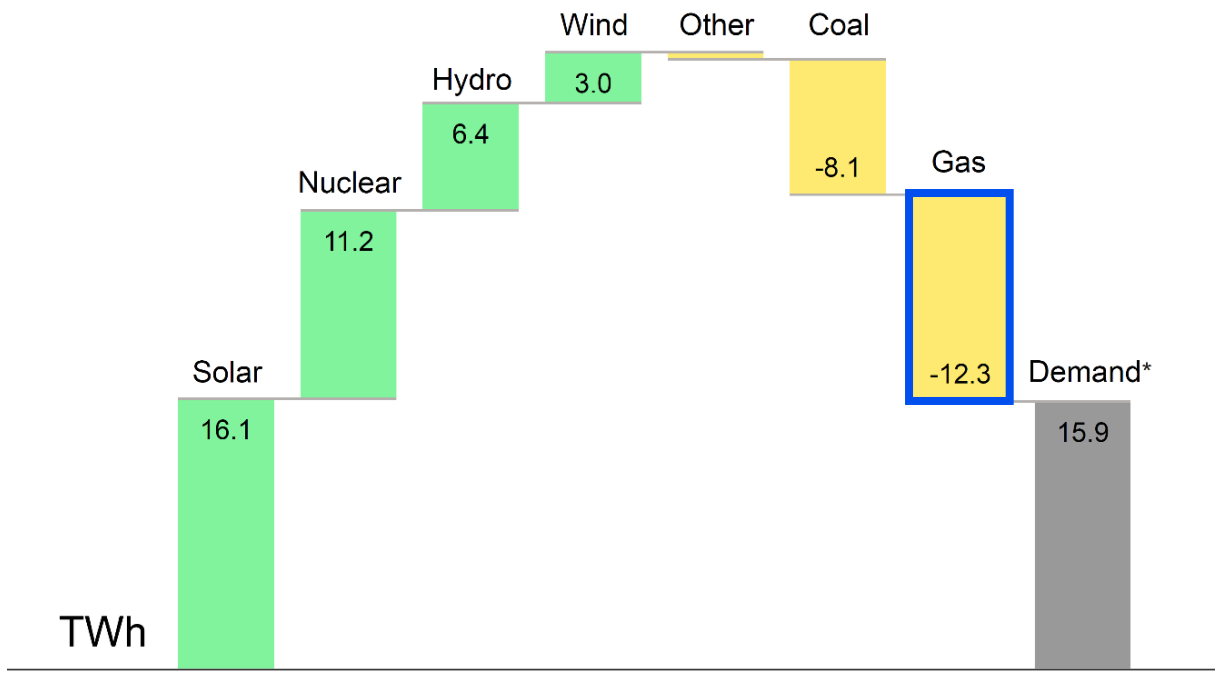


Gas consumption decreased marginally (est. -69 TWh) from January to August compared with the same period in 2023. Lower gas burn for power generation and stagnant household demand more than outweighed the minor increase in industrial gas demand (est. +9 TWh in Q3*). Demand from all three segments of gas consumers remained far below the pre-crisis norm at the EU aggregate level.

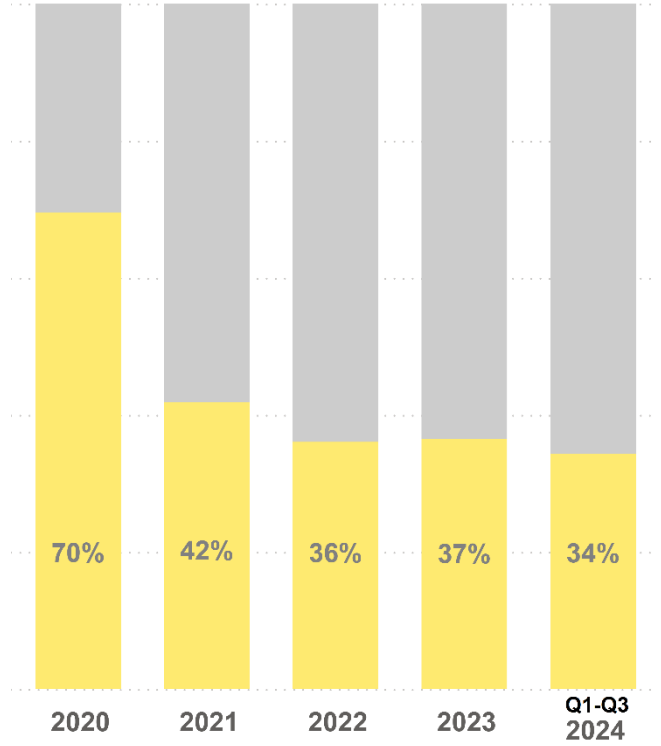
Source: ACER based on Eurostat, ENTSOG, ENTSOE and Trading Hub Europe data.
Note*: Estimated change in industrial gas consumption based on data for Germany, France, Italy, Belgium and the Netherlands.

Trend of renewables displacing gas generation continued

Year-on-year change for main electricity generation technologies, Q3 2024 (TWh)



Percentage of hours when electricity day-ahead prices were above costs of producing electricity from gas on average in the EU-27, Q1-Q3 2020-2024 (%)



Compared with the same period last year, gas-fired power generation in the EU declined by 12 TWh in the third quarter of 2024. Increased renewables' output limited the opportunities for conventional power plants (gas and coal) to run profitably. This resulted in reduced carbon emissions, loosened the EU gas demand-supply balance and reduced the role of gas as the marginal price setter in electricity markets.

Source: ACER calculations based on European Network of Transmission System Operators for Electricity (ENTSO-E) data.
Note: Hydro does not include hydro-pumped storage. Hydro-pumped storage, biomass and other generation sources were accounted for separately, under the category 'Other'.
'Demand' combines consumption and net imports from countries outside the EU.

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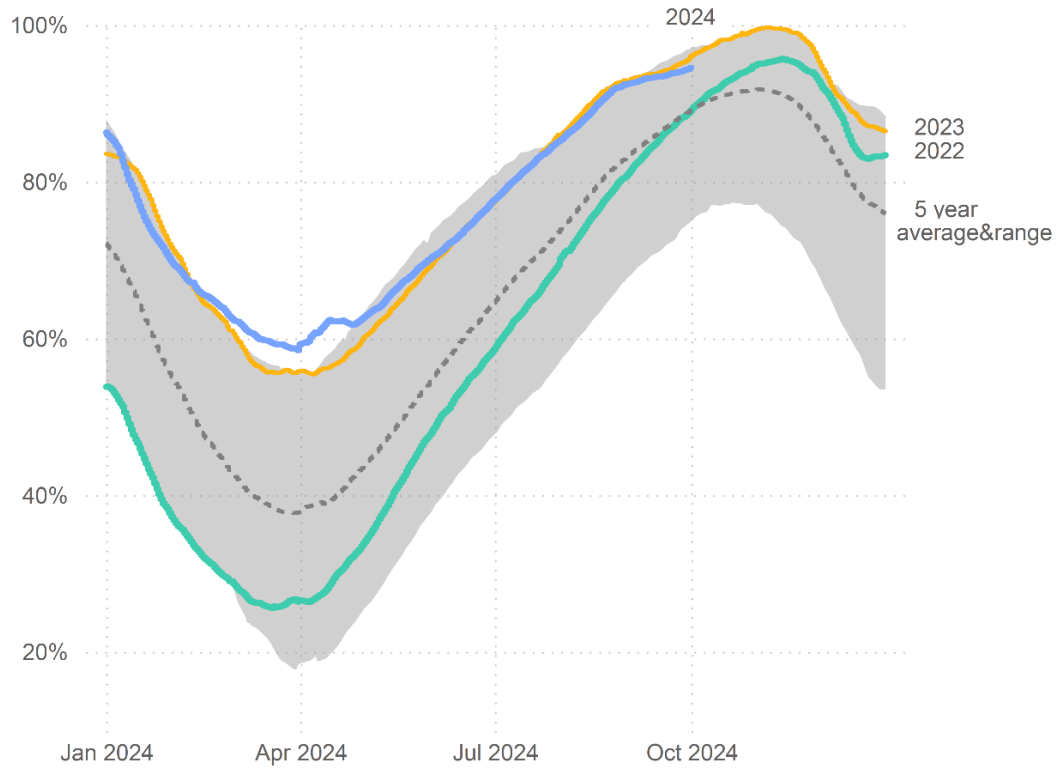
Infrastructure developments in the third quarter of 2024

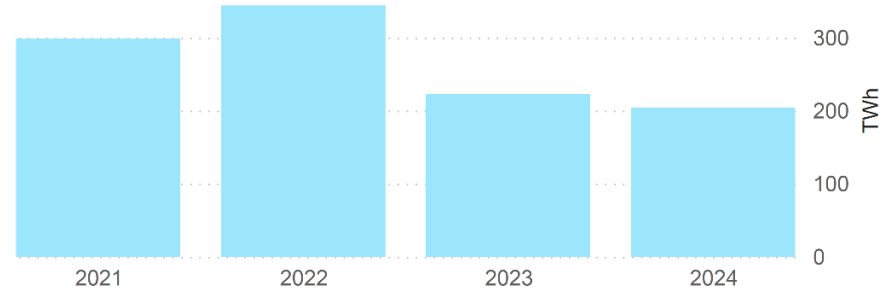
Utilisation of storage, LNG and transmission network

Modest injections were sufficient to fill up storages

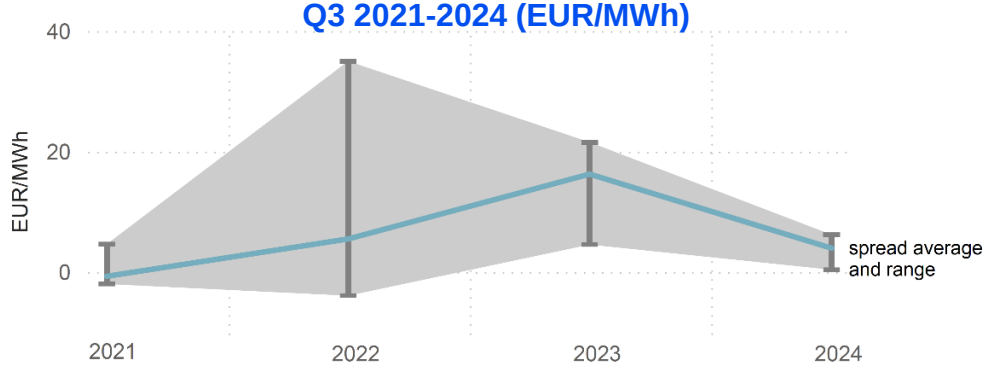
EU gas storage levels, 2018-2024 (% of working gas volume)



EU gas storage injections, Q3 2021-2024 (TWh)



Season ahead (winter) – day ahead (summer) time spread, Q3 2021-2024 (EUR/MWh)

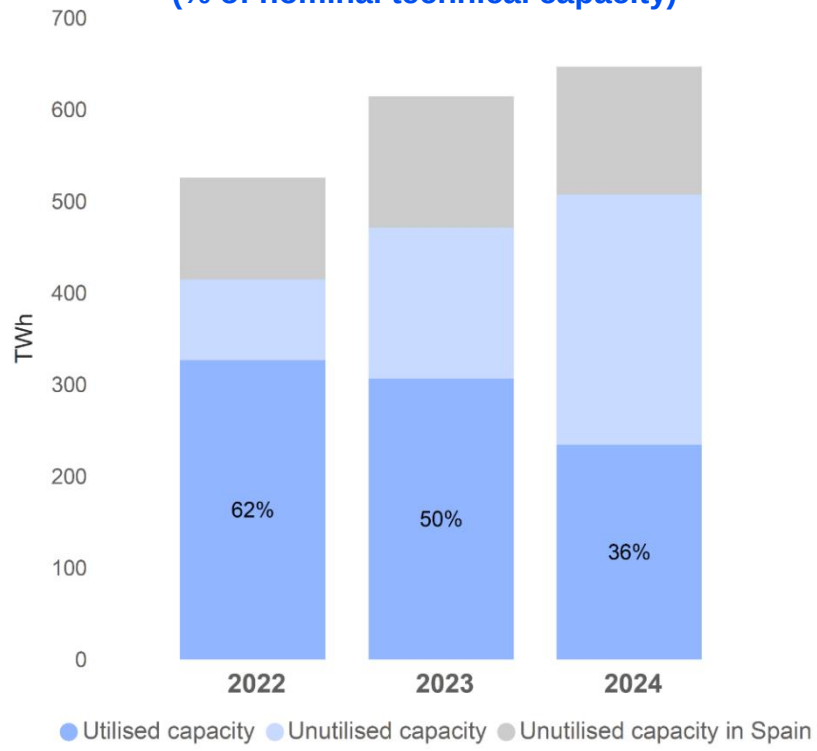


Underground storages were close to nominal capacity as gas summer finished. Injections over the quarter summed to 204 TWh – marginally lower compared with the same period in 2023 and considerably less than those in 2022. The market signal to store gas (i.e. the summer-winter spread) was positive, consistent but not particularly strong over the quarter.
In addition to market signals, the EU storage regulation[1] plays an important role in ensuring adequate storage fulness.

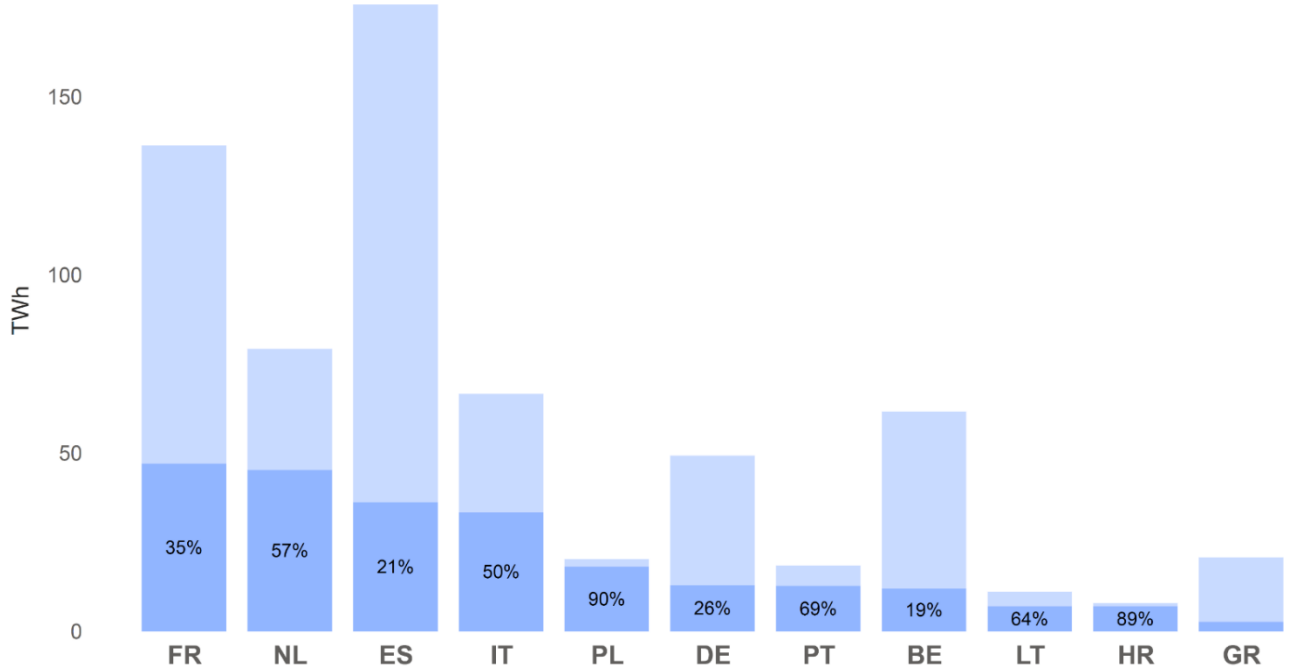
Source: ACER based on Gas Infrastructure Europe data and ICIS.
Note 1: The EU adopted the Gas Storage Regulation (Regulation (EU) 2022/1032) in June 2022 mandating Member States to fill storage facilities to at least 80% of their capacity by 1 November 2022, and up to 90% by 1 November in subsequent years. Storage filling targets for 2024 are set in Regulation (EU) 2023/2633:

Spare terminal capacity increased as LNG imports fell

Utilisation of LNG terminals in the EU, Q1-Q3 2023-2024 (% of nominal technical capacity)



Utilisation of LNG terminals per Member State, Q1-Q3 2024 (% of nominal technical capacity)

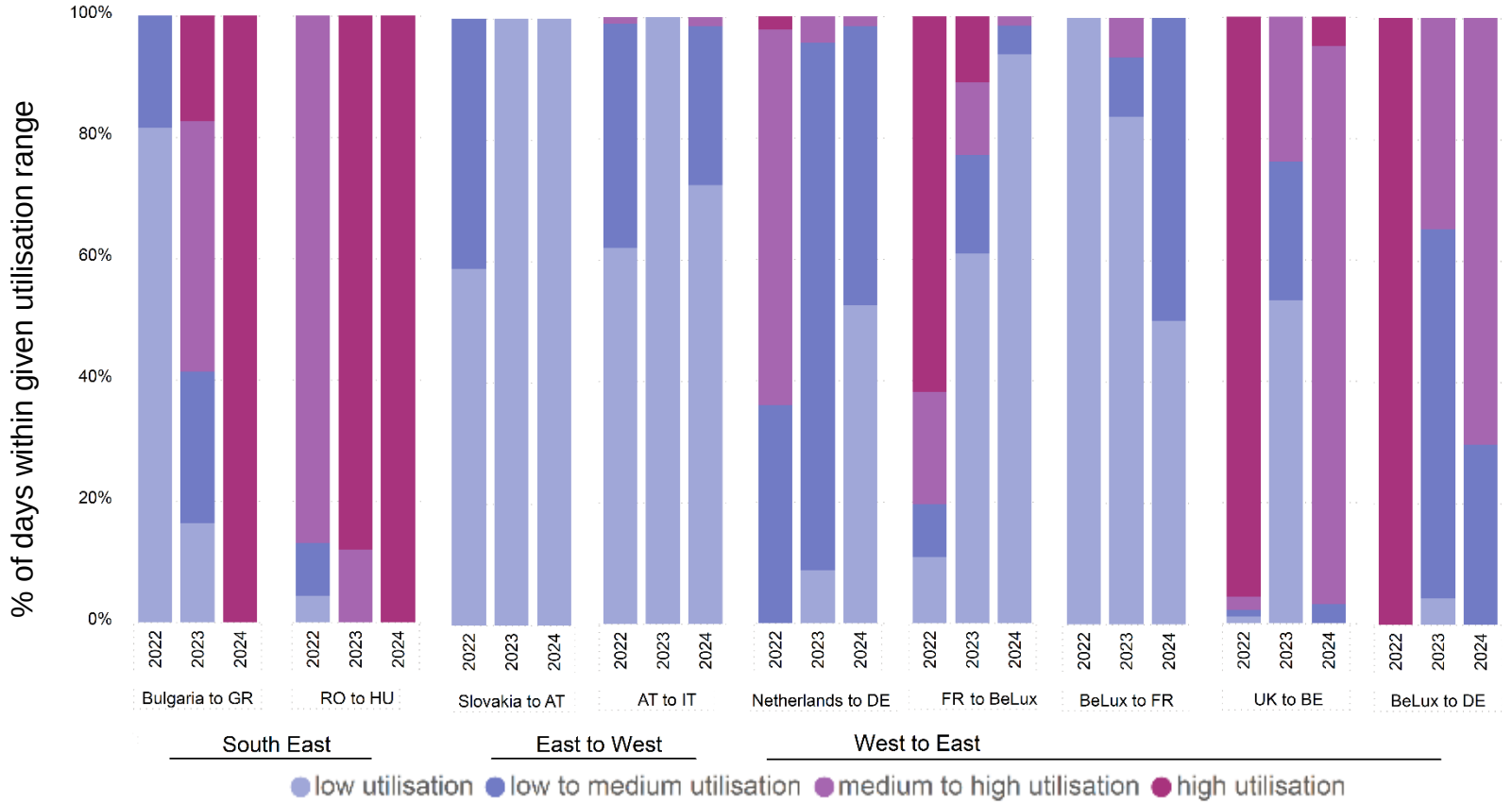


European LNG terminals saw their highest historical utilisation[1] less than two year ago (i.e., in Q4 of 2022), but additional terminal capacity coupled with lower demand saw Q3 2024 pass with substantial spare LNG capacity. Questions around EU LNG capacity saturation notwithstanding, spare LNG capacity is one of the key flexibility resources for managing the gas supply-demand balance both seasonally (e.g., in Greece[2]) and structurally (e.g., any additional decline of Russian pipeline supply will largely be substituted by LNG).

Source: ACER based on Gas Infrastructure Europe data and ICIS LNG Edge.
Note 1: Utilisation calculated as ratio between technical nominal capacity and send-out volumes. See expanded considerations on the subject in ACER's LNG Market Monitoring Report (April 2024).
Note 2: In some gas markets (e.g., Spain, Greece) that lack sufficient other gas supply flexibility (UGS, interconnector capacity), LNG terminals are dimensioned to meet peak winter demand.

Congestion shifted from west to south-east in Q3

Utilization of gas interconnectors – selected borders, Q3 2022-2024



Infrastructure enhancement (e.g., new LNG terminals) and lower gas demand in Q3 were reflected in easing of congestion at interconnectors between West and Central Europe (e.g., Netherlands to Germany). High gas supply to South-Eastern Europe – a trend already observed in the first half of 2024 – continued in Q3. This resulted in congestion at several interconnectors in the region.

Source: ACER congestion analysis based on data provided by ENTSOG.
Note: low utilisation = 0-25%; low to medium utilisation = 25-50%; medium to high utilisation = 50-75%; high utilisation = 75-100%.

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In focus: transport tariffs evolution and their impact on price formation

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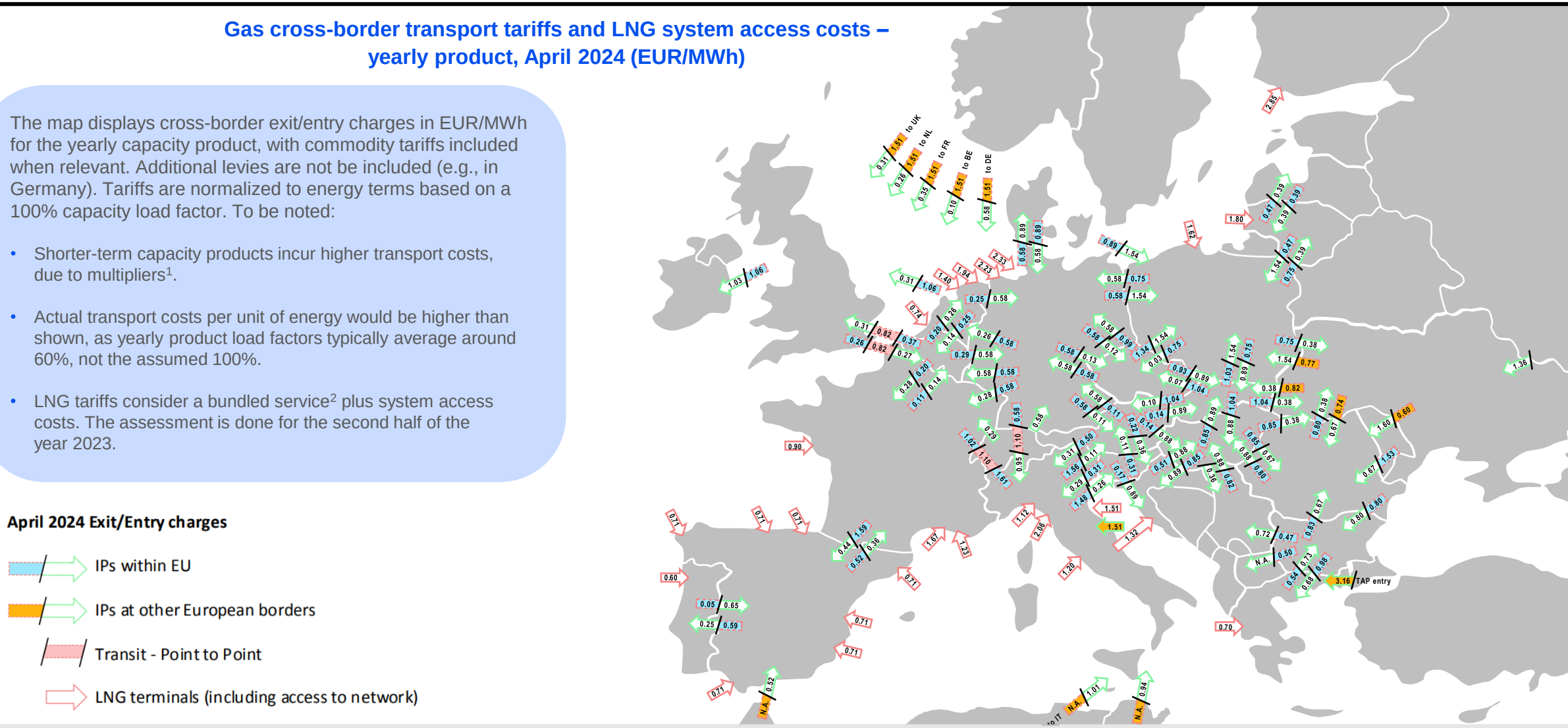
EU cross-border tariff levels vary per border and product

Gas cross-border transport tariffs and LNG system access costs – yearly product, April 2024 (EUR/MWh)

The map displays cross-border exit/entry charges in EUR/MWh for the yearly capacity product, with commodity tariffs included when relevant. Additional levies are not be included (e.g., in Germany). Tariffs are normalized to energy terms based on a 100% capacity load factor. To be noted:

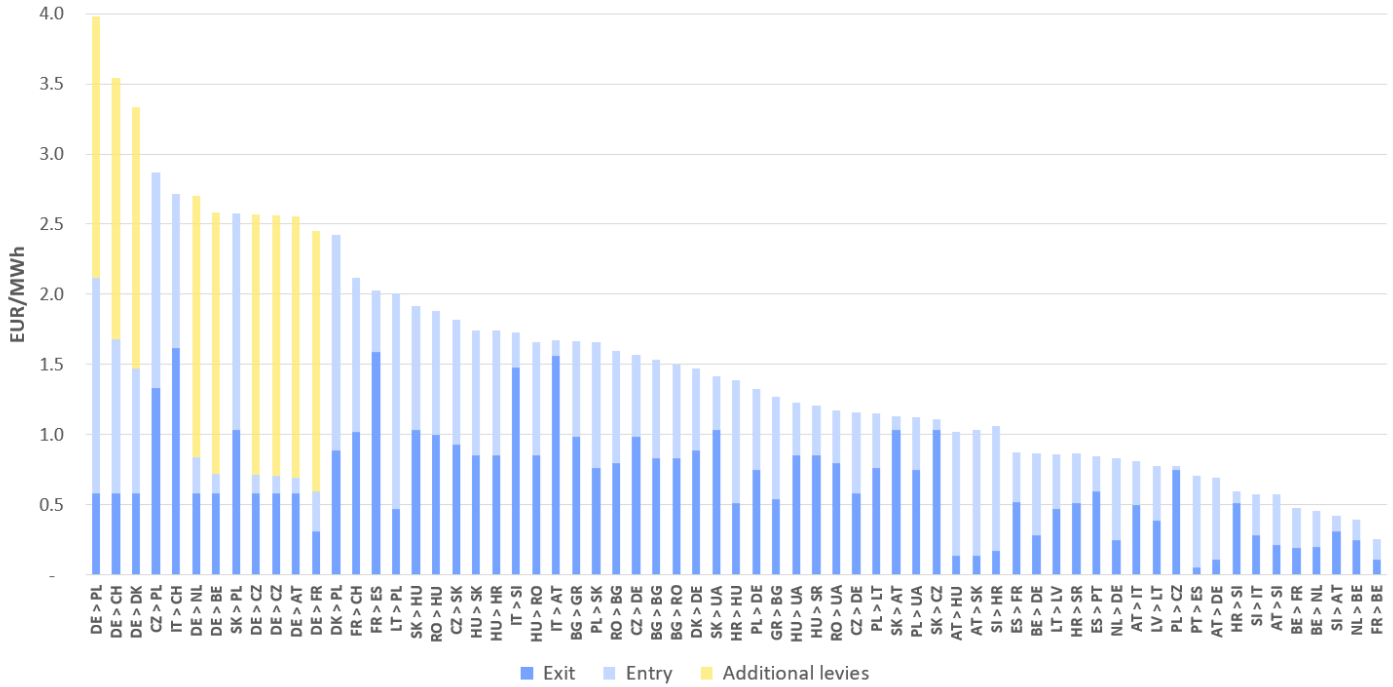
- Shorter-term capacity products incur higher transport costs, due to multipliers[1].
- Actual transport costs per unit of energy would be higher than shown, as yearly product load factors typically average around 60%, not the assumed 100%.
- LNG tariffs consider a bundled service[2] plus system access costs. The assessment is done for the second half of the year 2023.



Source: ACER calculations based on European Network of Transmission System Operators Gas (ENTSOG) and individual Transmission System Operators (TSO) data.
Note 1: In accordance with ENTSOG's tariff monitoring report 2024, more than half EU systems had daily tariff multipliers equal or above 1.5. Note 2 LNG tariffs assessment considers LNG with an energy content of 1000 GWh to be offloaded, stored, regasified and injected into the system over a period of 15 days. When relevant, the size of the cargoes considered is 140.000 m3.

Variety in cross-border tariffs stems from multiple factors

Overview of gas cross-border transport costs at selected borders – yearly product*, April 2024 (EUR/MWh)



Those factors include:

I. The allowed or target revenue of the TSO, shaped by infrastructure costs and their depreciation periods.

II. The level of capacity bookings, influenced by demand and gas transit needs as well as by shippers' booking strategies.

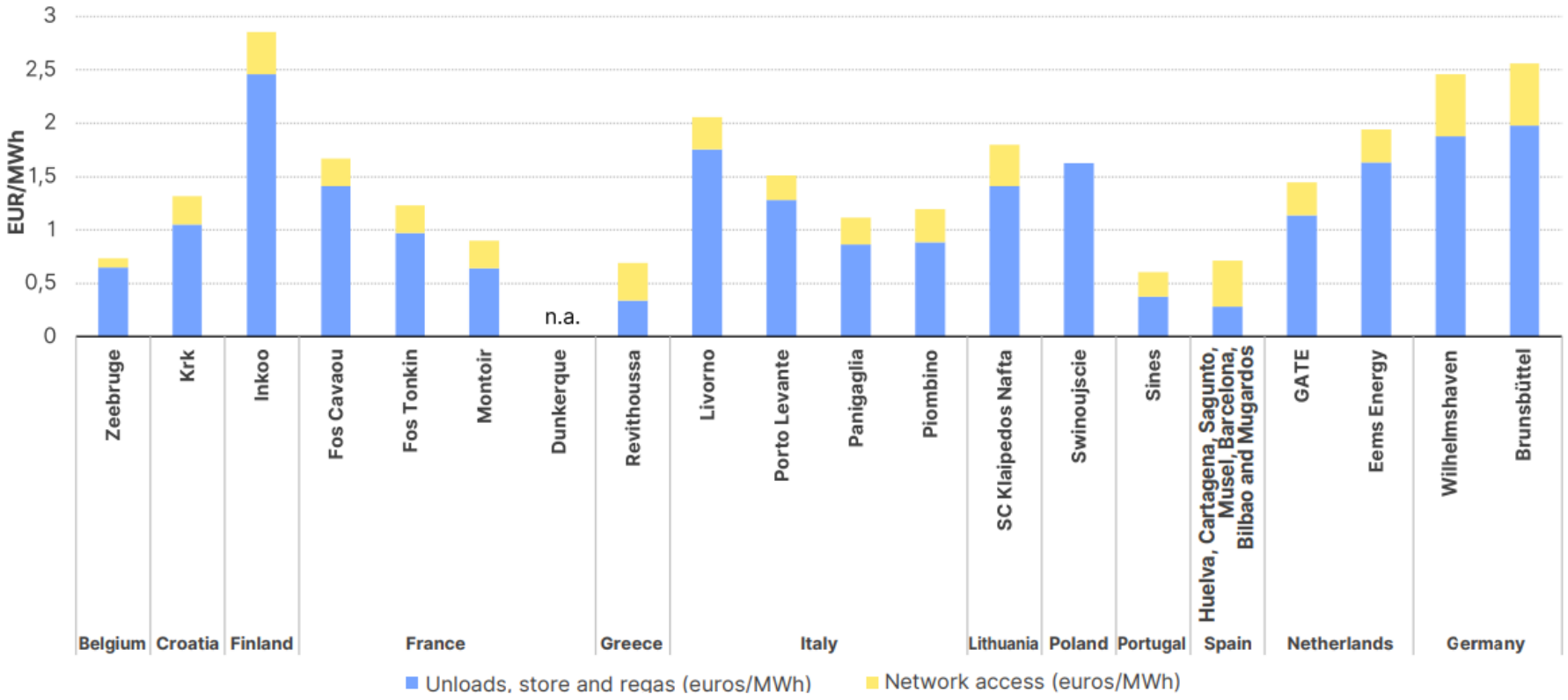
III. The applied reference price methodology, including elements such as the entry/exit split, capacity products' multipliers or potential tariff adjustments.

IV. The network topography and the geographical position of the market.

Source: ACER calculations based on European Network of Transmission System Operators data.
Note: See clarifications about tariff calculation on slide 19.

LNG terminal and network accessing costs differ

Overview of EU LNG terminal and network accessing tariffs, April 2024 (EUR/MWh)



In the integrated EU market, where LNG infrastructure can provide access to broad regional areas, competition among LNG terminals is influenced by tariff levels. Lower tariffs can potentially attract more cargoes and increase utilisation rates. Therefore, terminals' tariffs should reflect costs to ensure fair competition. Certain reductions in the tariff to access the network may be permissible yet, if they demonstrably enhance the security of supply, benefiting the overall energy system.

Source: ACER calculations based on GIE ALSI LNG transparency platformand European Network of Transmission System Operators data. When regulated reserve tariffs not available, information refers to concluded allocation processes. Note: The assessment specifically examines those costs using the tariffs for a bundled service, encompassing unloading, storage, and regasification services.
The assessment is done for the second half of the year 2023 and considers LNG with an energy content of 1000 GWh to be offloaded, stored, regasified and injected into the system over a period of 15 days.
The comparison considers for both LNG and system access tariffs annual contracts, normalized with a 100% load factor. When relevant, the size of the cargoes considered is 140.000 m3.

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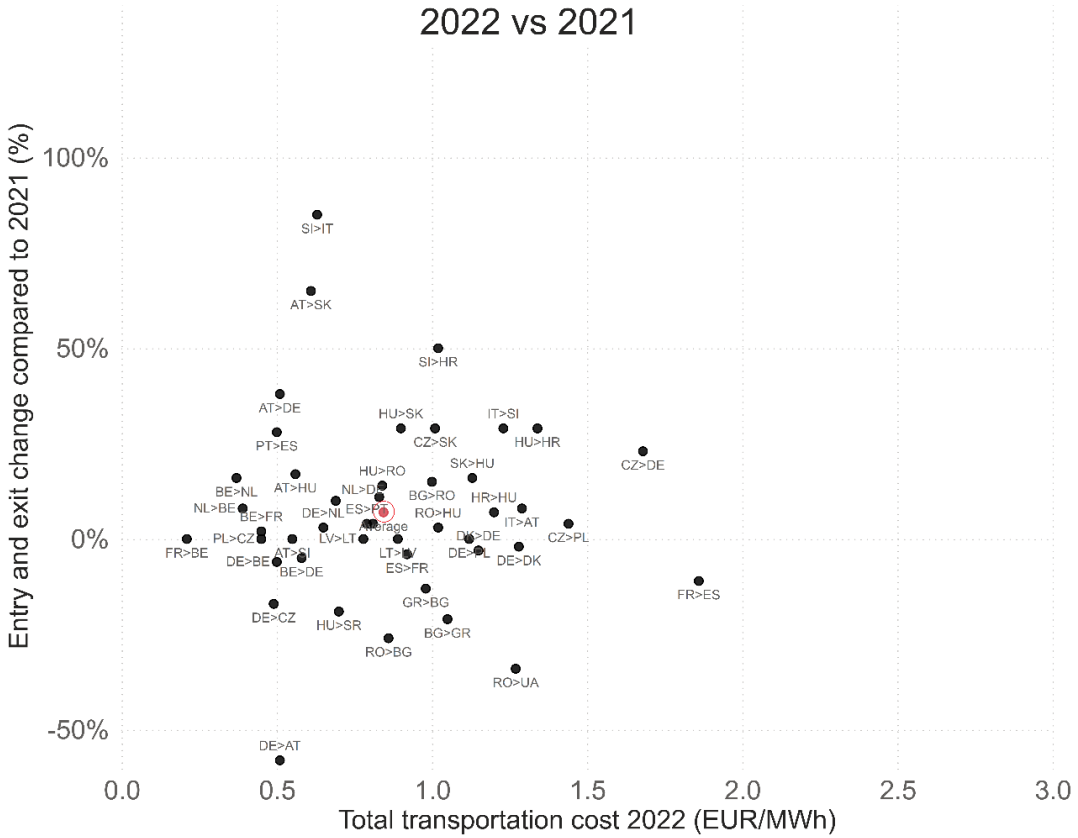
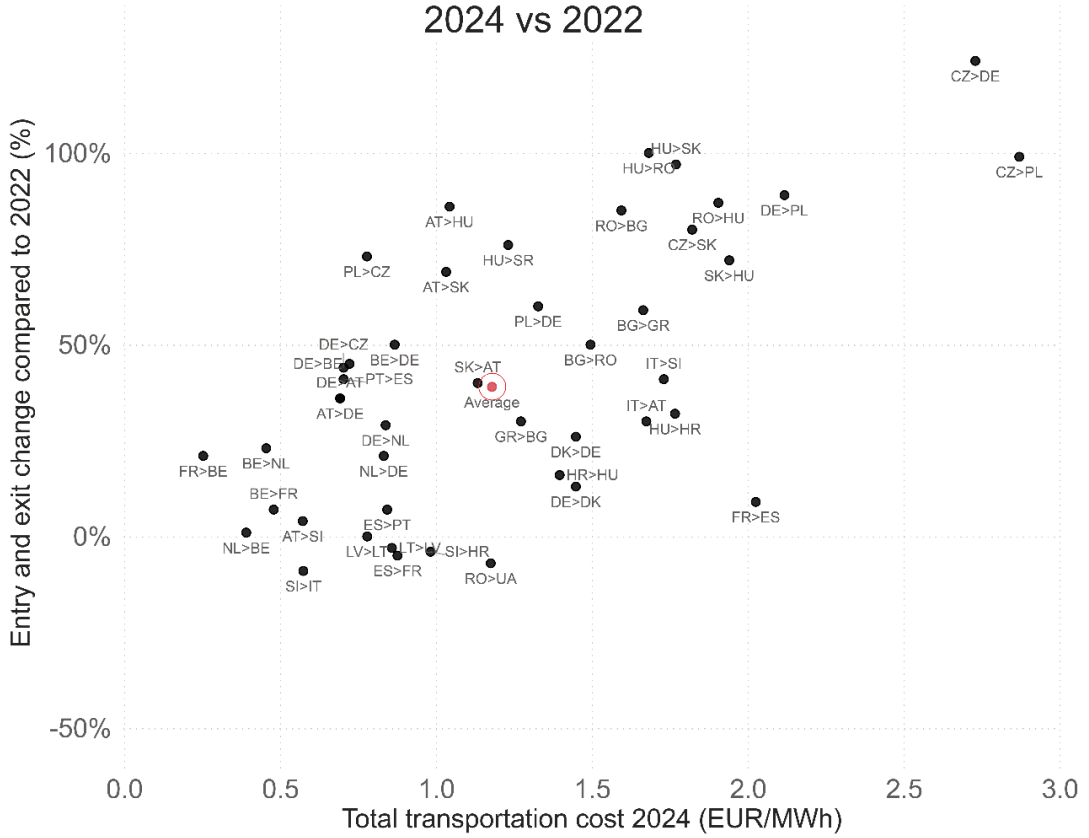
Notable tariff rises are observed in the last couple of years

Relative change in yearly gas cross-border transport costs for selected gas supply routes – delta (%)





EU cross-border transport costs have risen by circa 40% since 2021 on average, double the rate[1] of inflation. Various of the recently updated tariff methodologies will result in further tariff increases, while overall, several factors may[2] continue driving this upward trend.

Source: ACER calculations based on European Network of Transmission System Operators Gas data. The relative change refers to the sum of entry and exit reserve price tariffs, excluding potential additional charges and levies (e.g., in Germany). Note 1: 2022 vs 2021 average increase lagged behind inflation, which may indicate also a certain catching up. Note 2: Other factors may offset the trend though. Chiefly, in many EU gas systems amortisation is well advanced, and if investments remain modest, this could mitigate the upward pressure on tariffs in the coming years.

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Various factors contribute to the upward tariff trend

I. Substantial drop in EU demand, falling by more than 25% since 2021 to date, leading to lesser cross-border gas flows.

II. Connected to that, gradual expiration of capacity contracts not being renewed in full (special relevance in various systems carries the discontinuation of Russian transit flows. Conversely, in other selected systems bookings rose instead, to accommodate the changes in flow direction). Shifting booking strategies giving more prominence to shorter-term products can also play a role[1].

III. Moderate increase in allowed revenues, driven by selected new-investments to diversify supply away from Russia and by a rising inflation.

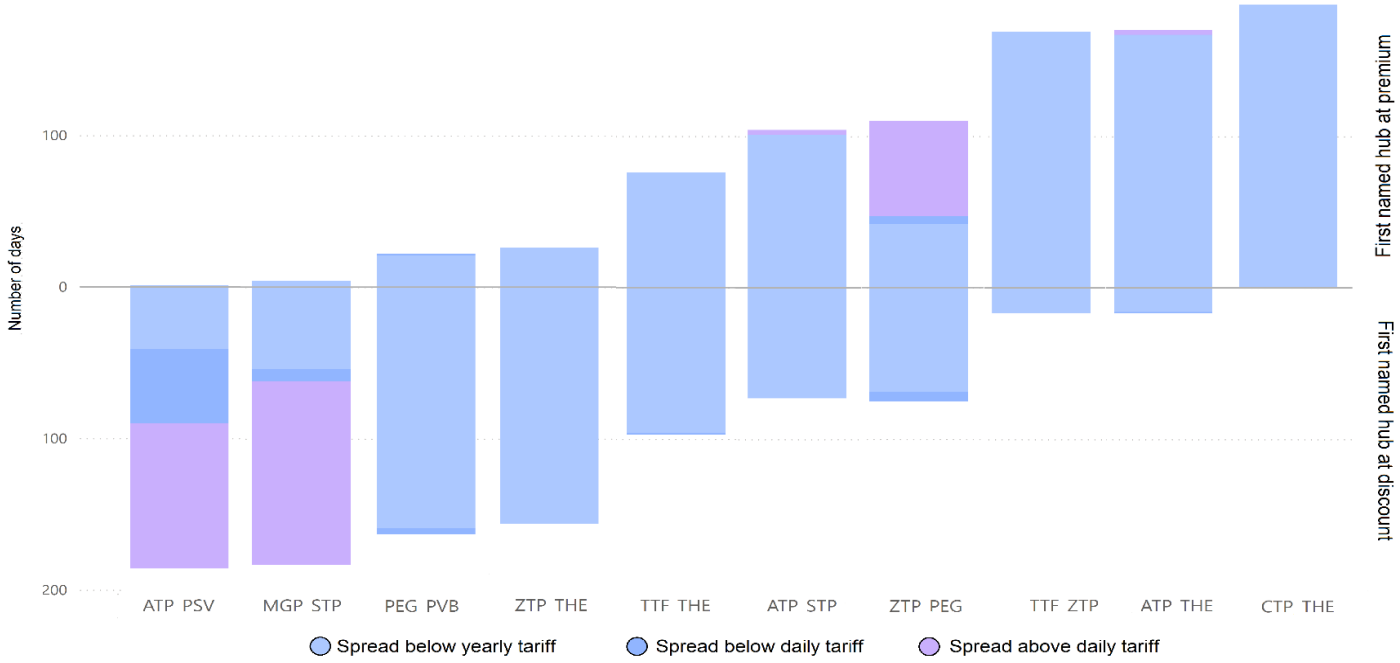
IV. Accelerating revenue recovery in selected systems, in anticipation of a potentially steeper decline in demand.

V. Addition of non-tariff costs such as levies and charges in selected systems. Plus, discounts in the network access tariffs from selected LNG or storage facilities, transferred into interconnection points[2].

Note 1: Short-term tariffs are typically higher than annual tariffs as short-term products account for tariff multipliers above 1. In accordance with ENTSOG's tariff implementation report, the average EU daily tariff multiplier was 1.73 in 2022. Cheaper tariffs at long-term capacity products are aimed to incentive longer booking to secure revenue recovery, yet higher short-term multipliers can impact price spreads upwards and can carry multiplicative effects. Note 2: In accordance with ENTSOG tariff monitoring report 2024, 7 systems granted a 100% discount in storages entry and exit fees, while 10 systems grant partial or even full discounts to LNG entries.

Despite upward pressures, hub price spreads stay below tariffs

Day-ahead price spreads relative to reserve daily and yearly transportation tariffs for a selection of neighbouring EU hubs, 2024 (% of trading days within given price spread range)



Observations for 2024 indicate that spot price spreads between most EU hub pairs remain generally below both daily and annual transport tariffs. This suggests that the increasing transport costs are not entirely hindering price convergence. Trading at short-run-marginal-cost (for those participants with sunk capacity), variety in supply portfolios and their optimisation, financial arbitrages or marginal pricing aspects overall impact individual hubs' price formation and limit the direct additive influence of tariffs over spreads.

Source: ACER calculations based on ENTSOG TP and ICIS.

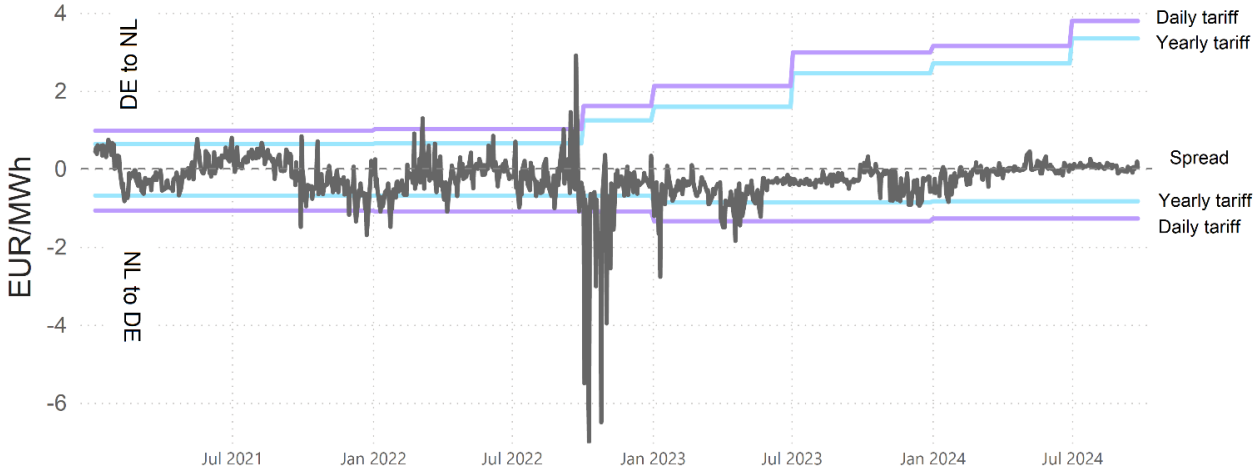
As tariffs influence, but are not the sole driver of spreads

Overall, hub spreads have somewhat increased relative to pre-crisis levels due to shifting flows and higher congestion in some areas. Rising transport costs are partly contributing as well. This has resulted in greater instances of hub price spreads above daily capacity tariffs than in the past. However, as discussed, most often spreads still fall below tariffs due to combined and multifaceted aspects.

A hub price spread above the tariff in the same timeframe represents a market arbitrage opportunity that would trigger shippers' interest to book transportation capacity. Spreads largely exceeding transportation tariffs reveal scarcity of transportation capacity due to either physical or contractual congestion, as it was the case in 2022.

Day-ahead price spreads evolution relative to reserve daily tariffs – average of 10 EU hubs (% of trading days)

Day-ahead price spreads relative to reserve daily and yearly transportation tariffs between Netherlands and Germany, January 2022-October 2024 (EUR/MWh)



Source: ACER calculations based on ENTSOG TP and ICIS.

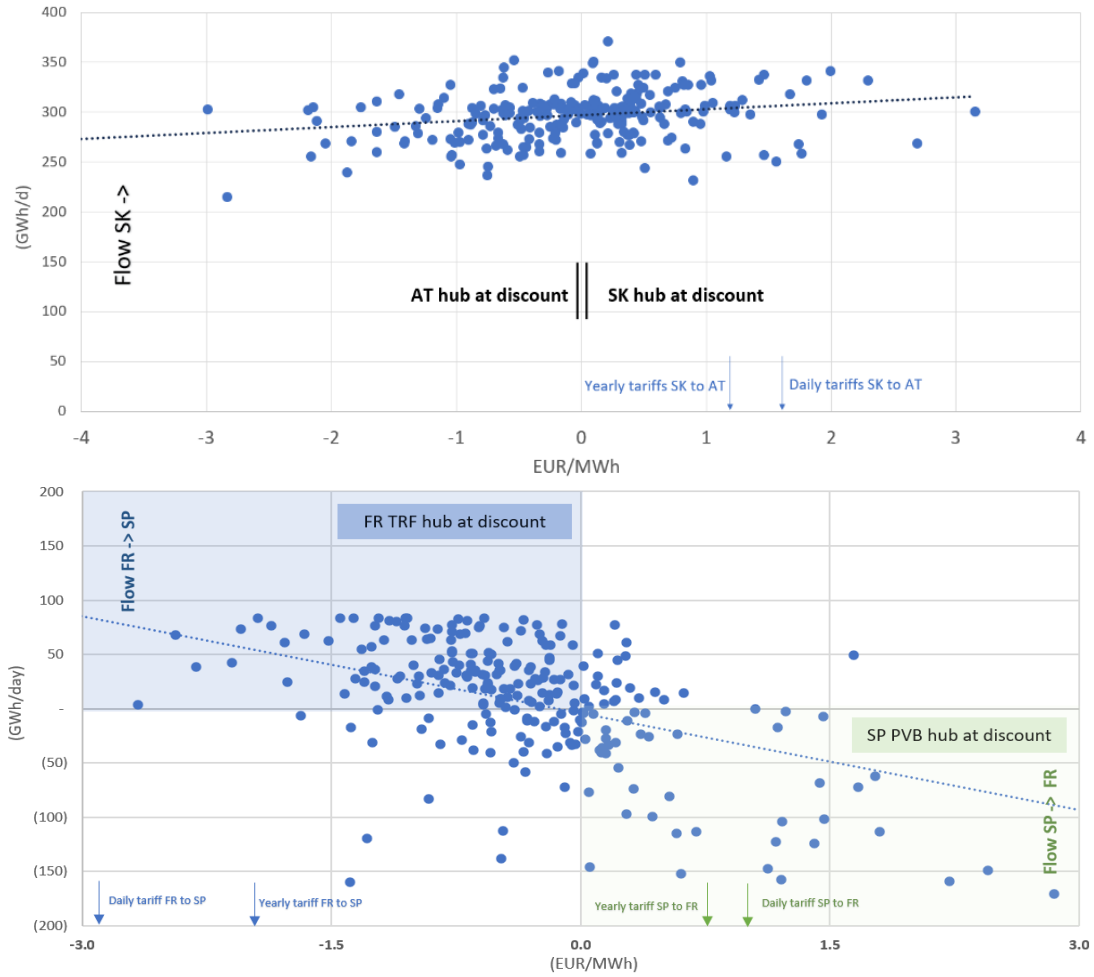
Tariffs and spreads influence flows, but aren't the only factors

Daily and yearly tariffs, daily hub spreads and net renominations at Baumgarten (SK-AT) and VIP PIRINEOS (FR-SP) Interconnection Points (IPs), October 2023-October 2024

The impact of tariff levels over spreads, and then that of spreads on flows, tends to depend on the role of the interconnector:

1. Limited flow responsiveness to hub spreads and tariffs tends also to derive from the EU networks' design, the geographical location of the hubs and prevailing long-term contracts. For example, large transit flows in a dominant direction irrespective of the hub-spreads are needed to flow gas from external producers and entry points to EU consumers.

2. In other instances, net flows have a higher tendency to change direction in accordance with hub spreads, while flown volumes tend to be higher whenever spreads exceed transportation costs.

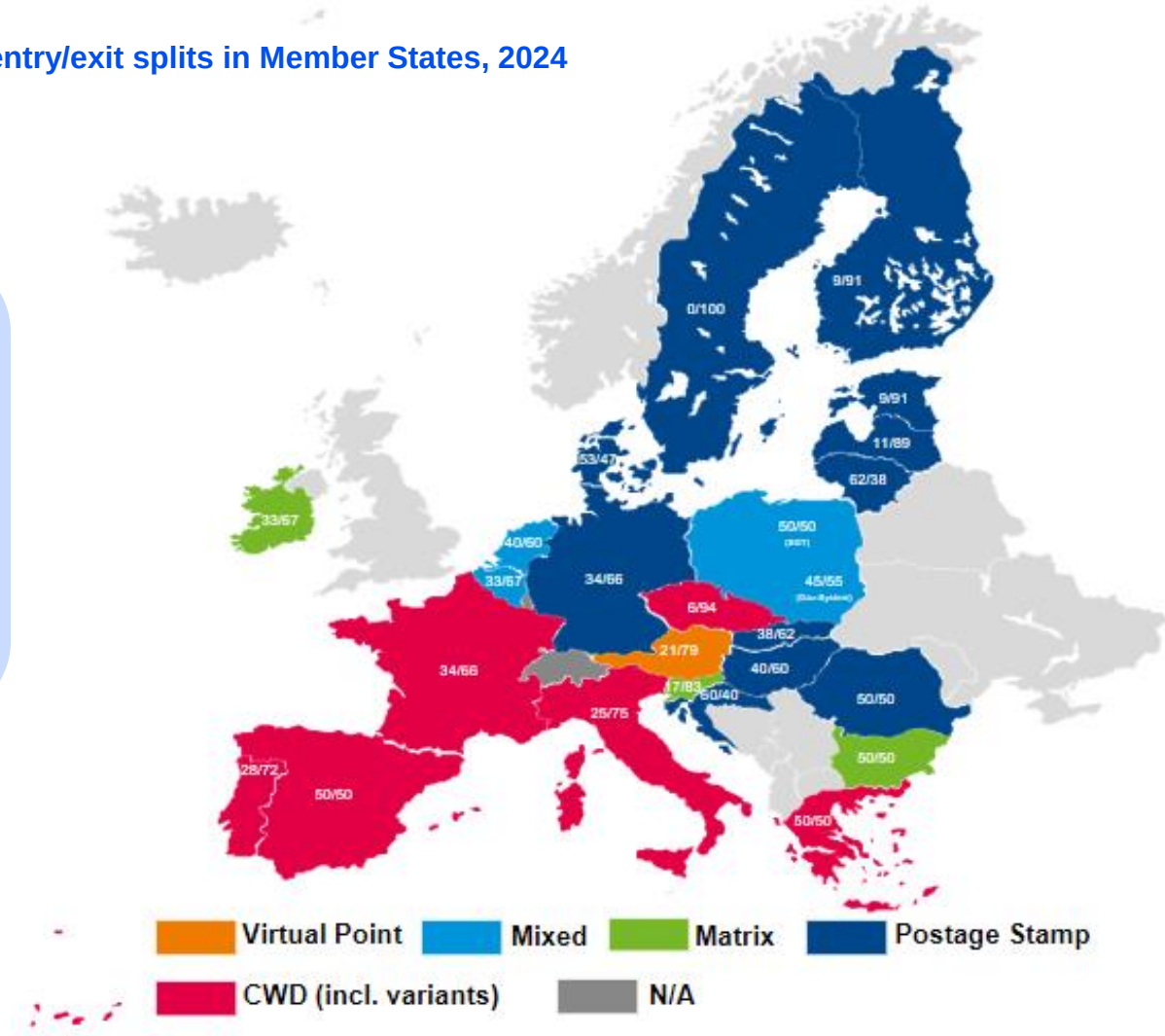


Source: ACER calculations based on ENTSOG TP and ICIS.

Tariff fairness is essential for the integrity of EU gas market

Gas transportation tariffs will play an increasingly significant role in the functioning of the EU internal gas market in the coming years, supporting or hindering gas supplies from specific sources, whilst likely accounting for a larger relative share of final consumers' bills. While various allocation practices and adjustments are permissible within the framework set by the Transmission Tariff Network Code, it is essential that tariffs adhere to the principles of cost-reflectivity and avoid cross-subsidiation. In this regard, recent tariff increases can be consistent with cost-reflectivity, and hence such increases do not require interventions.

Tariff methodologies and entry/exit splits in Member States, 2024



Note: Mixed cases in countries such as the Netherlands, Belgium, and Poland involve interconnectors or transit pipelines that operate under different methodologies compared to those governing the national Transmission System Operator.

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Future tariff levels will be influenced by contrasting factors

Going forward, gas tariff evolution will be affected by different drivers, chiefly demand evolution, assets depreciation and decarbonisation ambitions:

I. Amid declining final consumption and ongoing decarbonisation efforts, the use of gas networks is expected to further decrease, which may increase tariffs due to lower network utilization. The drop in capacity use is today marked at transmission level, amid declining gas-fired power generation, but is likely to be stronger in the distribution network if households' heating needs significantly electrify.

II. However, in many EU gas systems infrastructure amortisation is well advanced, and if investments remain modest, focusing on optimizing existing resources before making new investments, that could help mitigate upward pressure on tariffs in the coming years.

III. Two key factors in the decarbonisation context are the extent of infrastructure decommissioning that may be viable and the criteria for repurposing existing gas network assets to support the emerging hydrogen market. Those factors will also impact actual gas tariffs evolution.

IV. Finally, the combination of lower but changing flow volumes and the need to ensure sufficient capacity for daily peak and overall supply security prompts careful consideration of the most efficient models for distributing capacity/commodity tariff payments.

Gas markets adapting to a changing landscape

Recent publications:

Analysis of the European LNG market

Energy retail monitoring

Capacities for cross-zonal electricity trade

In the third quarter of 2024, European gas markets continued to overall adjust to the new market landscape shaped by reduced Russian flows, increased reliance on LNG, direction-shifting flows, and falling demand. Since mid-summer 2024, opposing drivers have balanced each other, yet leading to some price volatility and higher prices in comparison to preceding months. Increased Norwegian supply, strong storage levels, and weak European demand have helped stabilize the market, counterweighting most of the price pressures stemming from a tighter global LNG market, the uncertainty of Russian gas transits via Ukraine and rising geopolitical tensions.

In parallel, rising transport costs – and outcome of the lower demand and lesser capacity bookings, but also higher inflation and additional levies in certain systems – are contributing to pushing hub price spreads up, affecting price convergence. Yet, hub spreads still tend to typically fall below total transport cost, as price formation is the result of combined drivers. Going forward, future tariff levels will be influenced by demand evolution, by assets depreciation and by decarbonisation ambitions.

ACER will continue to closely monitor the European gas market trends. The next update on the combined European gas and electricity wholesale markets in the year 2024 will be published in February 2025.

Upcoming publications:

Security of EU electricity supply
November

EU electricity wholesale market integration
October

Hydrogen market monitoring
November

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