



# ACER



European Union Agency for the Cooperation  
of Energy Regulators

# Highlights from gas balancing indicators

Gas year 2022-2023

22 July 2024

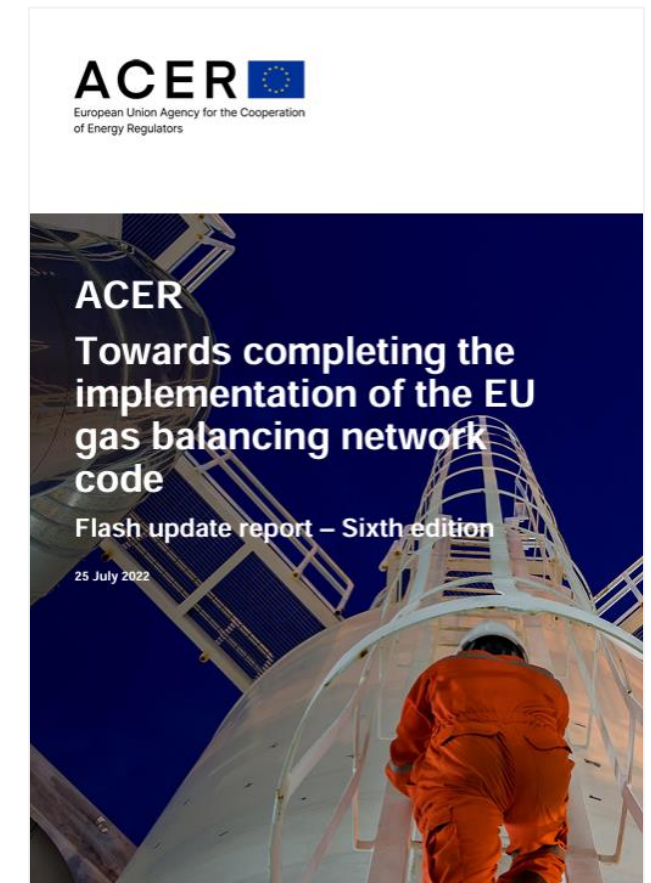
# 1. Introduction

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*ACER tasks and scope of 2024 work*

- The Gas Balancing Network code promotes market-based balancing rules to financially incentivise network users to balance their positions with short-term products. In doing so, balancing rules contribute to the creation and development of short-term gas wholesale markets in the EU. Moreover, balancing activity moderately influences short-term hub price formation and short-term cross-border capacity use.
- ACER has been tasked to monitor the effective implementation and effects of the Gas Balancing Network Code<sup>1</sup>. To that end, it has been sharing its findings in dedicated [Implementation Monitoring reports](#), which focus on key features of the balancing zones. Moreover, ACER has assessed the effects of the code as part of its [Market Monitoring Reporting](#) activities.
- Importantly, since 2022, ACER has made available on its website a [data dashboard](#) reporting relevant indicators to help understand balancing actions in each Member State.


Find more about ACER's balancing activities. 



1) COMMISSION REGULATION (EU) No 312/2014 of 26 March 2014 establishing a Network Code on Gas Balancing of Transmission Networks.

- In 2024, ACER has focused its balancing-related work on calculating and updating relevant balancing indicators for the gas year ('GY') 2022-2023 and making them available in its dedicated data dashboard.
- This presentation has been prepared to outline the highlights observed in the EU balancing systems in GY 2022-2023. It focuses on the comparison of indicators with the previous year and among national balancing zones.



[Access ACER's balancing data dashboard.](#) 

- To monitor the performances of the diverse balancing regimes, ACER has developed the **Balancing Analytical Framework ('BAF')**<sup>2</sup>, which provides a common framework to help assess and compare the different balancing zones across the European Union.
- The BAF quantitatively assesses the **role of the Transmission System Operator ('TSO')** in keeping the system balanced while also examining **Network Users' Imbalances** and **Neutrality Accounting**.
- The BAF has certain limitations in analytically capturing the **effectiveness of each balancing regime, based on the indicators** displayed on the dashboard. Consequently, this comparative analysis needs to be supplemented by a more detailed performance analysis at the national level. This involves contrasting several indicators within the national context and engaging with stakeholders as needed.
- The **data** for this analysis has been provided by ENTSOG and has been complemented and validated by the Agency with the help of the **National regulatory authorities ('NRA')**. The BAF indicators are assessed and updated annually and published on ACER's [gas balancing dashboard](#).

2) The BAF was introduced in ACER's Second Balancing Implementation Monitoring Report ([ACER Report on the implementation of the Balancing Network Code \(Second edition\) Volume I](#)).

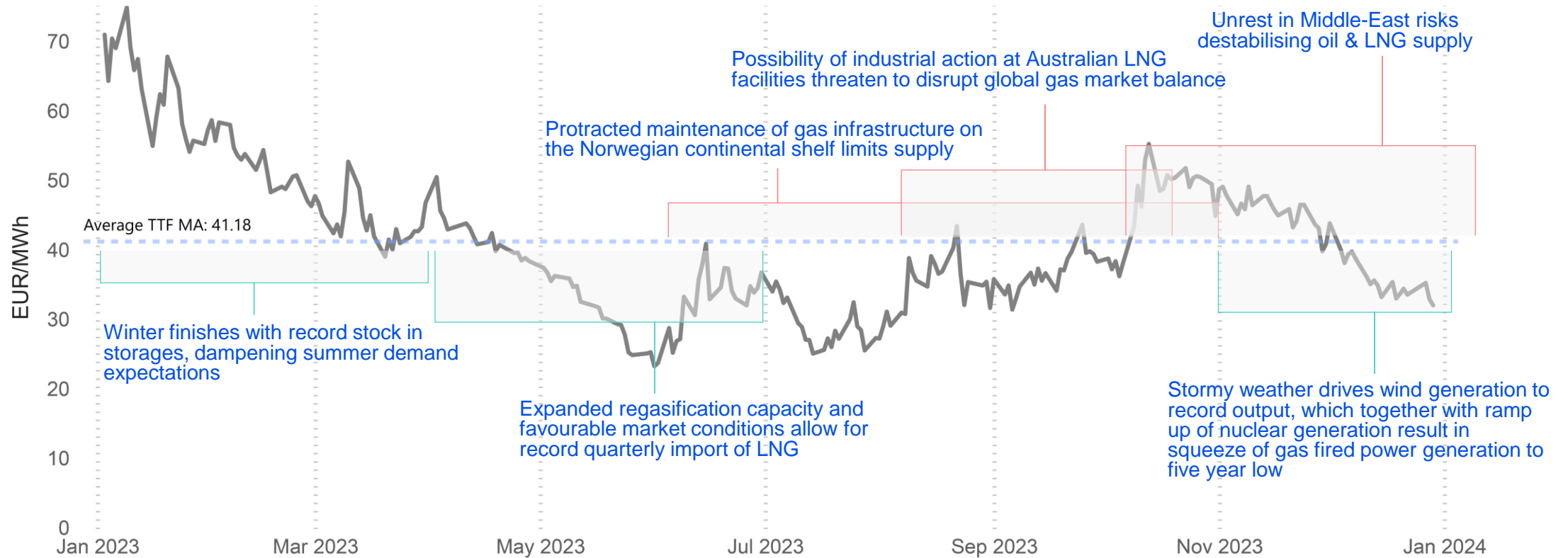
# 2. Wholesale market context

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*Insights into the gas markets dynamics in GY 2022-2023*

# Prices returned closer to historical levels, with stronger market fundamentals offsetting remaining geopolitical risks

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

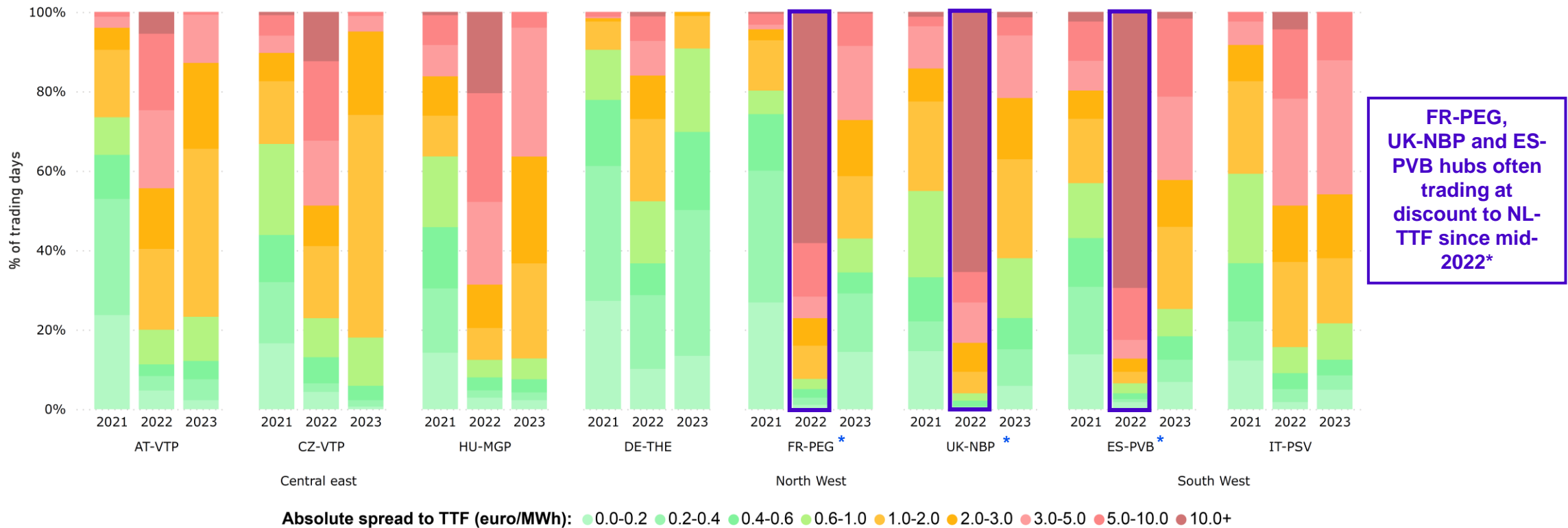


Low demand (including demand for electricity generation), solid gas storage levels at the end of winter, new LNG import capacity and stable gas supply (including of what has remained of Russian pipeline flows) were the main drivers of declining gas wholesale prices across the year.

Other events that risk gas supply were the strike at Australian LNG facilities, unrest in the Middle-East and outages of gas export infrastructure on the Norwegian continental shelf causing prices to rise in periods of 2023.

# Price convergence has improved but it has not reached previous levels

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



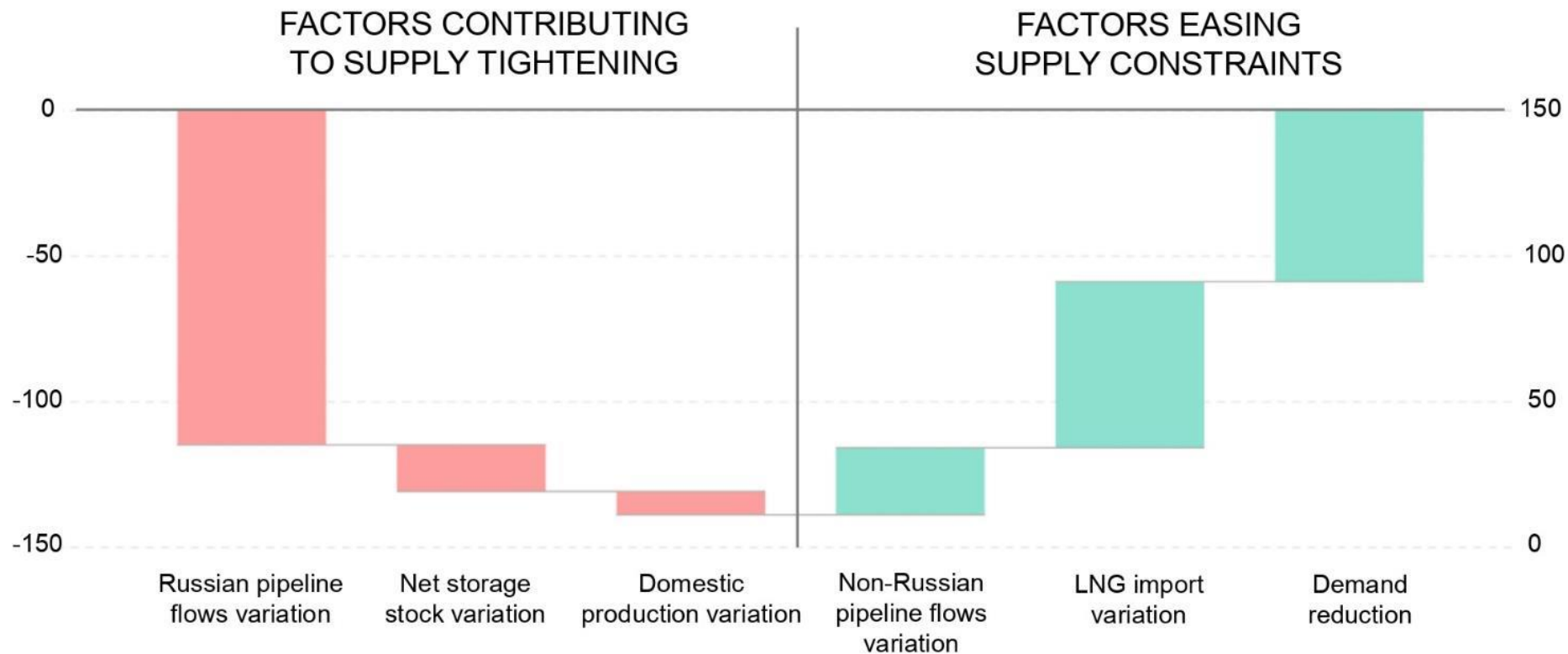
After a year of unprecedentedly high gas hubs' spreads, prices began converging again in 2023. New LNG import terminals and additional gas transportation capacity relieved physical network congestion that drove up price differentials in 2022 (being accompanied by a reconfiguration of gas flows on some borders after the stop of Russian pipeline flows). However, price convergence did not recover to levels seen previously.

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. The time span selected in this graph covers the period considered in the analysis of the balancing indicators in this presentation. (GY 2022-2023).



# The EU gas supply is gradually achieving a new equilibrium

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

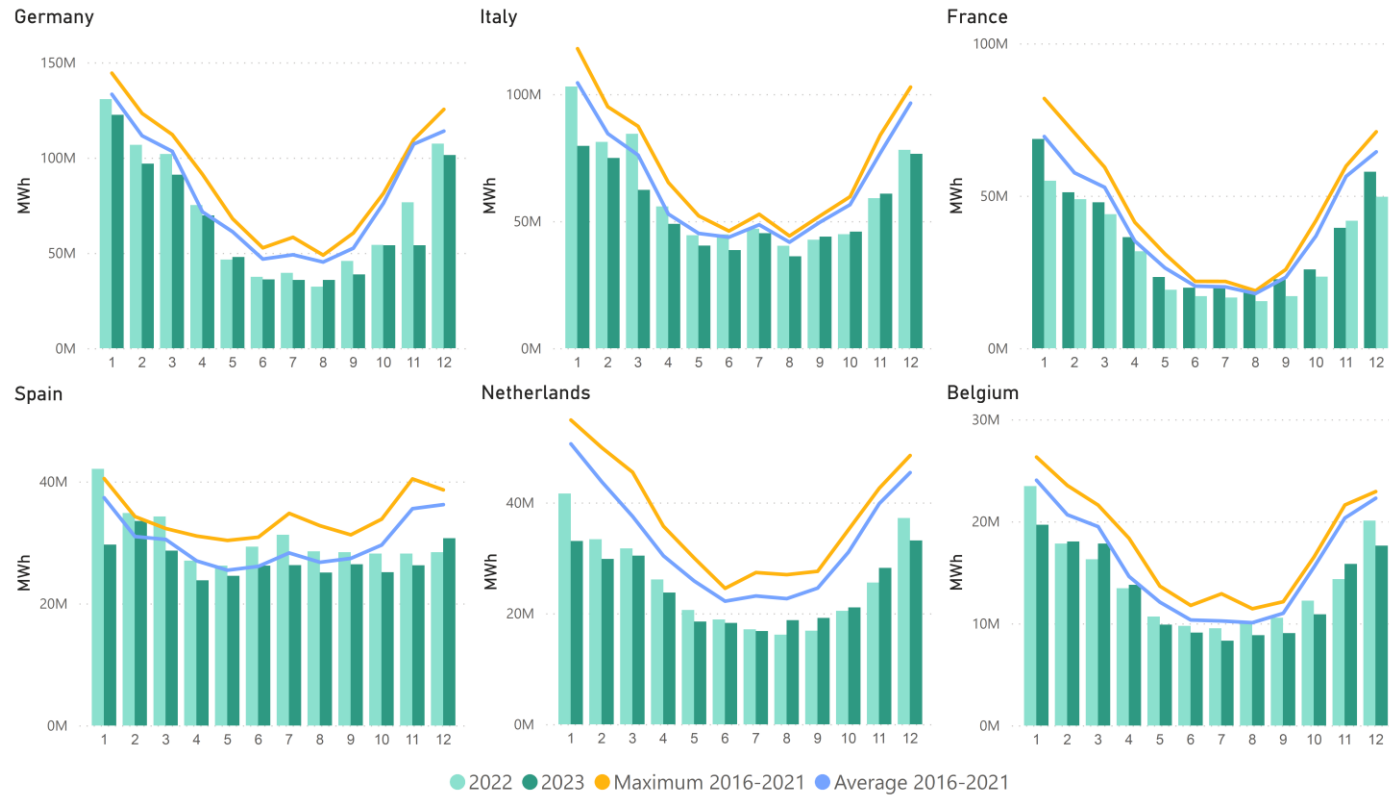


See expanded insights about the EU gas wholesale market developments in ACER's gas wholesale quarterly reports.

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. This has translated in lower prices, which are approaching 2021 levels.

# A lowering trend of gas consumption characterised 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>.


Source: ACER based on Eurostat.  
 Note: In comparison to the average of 2019-2021 the EU gas demand drop in 2023 reaches circa -20%.

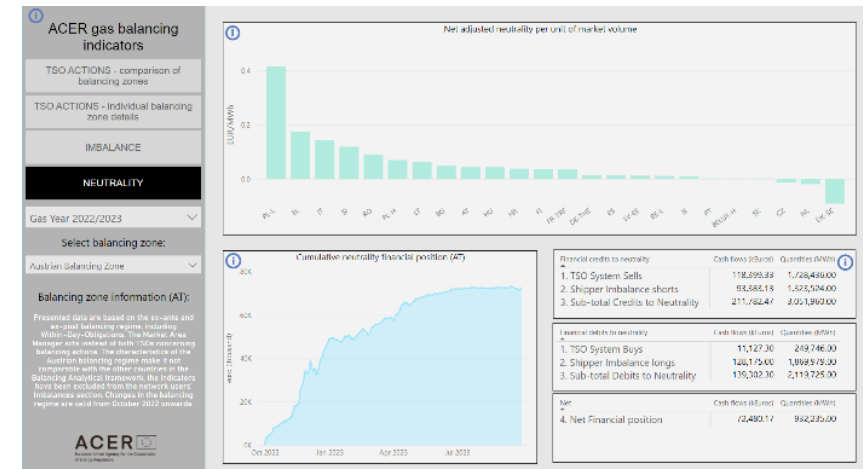
# 3. Introduction to ACER's Balancing Analytical Framework

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*Description and purpose of the relevant indicators assessed*

1. ACER monitors four indicators to assess **the residual role of the TSO**, describing the levels, the frequency, and the average price spreads concerning the **TSOs' buy and sell action**.
2. Three additional indicators describe the **network users' balancing activities**, looking at their imbalance quantities, the average imbalance prices and price spreads. They help to understand whether network users have sufficient incentives to balance their positions within the differently configured balancing regimes in the EU.
3. Finally, the **neutrality indicators**<sup>3</sup> - these are, **'net neutrality'** and **'net adjusted neutrality'** indicators - describe the net payments charged or credited to network users per unit of market volume. High values in these set of indicators may call for a closer national assessment.

Find more about these indicators in ACER's balancing data dashboard 



3) Please refer to ANNEX 3 of [ACER Report on the implementation of the Balancing Network Code \(Second edition\) Volume I](#) for more detailed information on the build-up of the neutrality account.

# Neutrality indicators are particularly relevant, as they inform about the actual cost of balancing

Example of the neutrality account in a balancing system, 2022-2023, MWh and EUR

	Quantities MWh	Cash flows kEUR	Relative share %
<b>Financial credits to neutrality</b>			
TSO system sells	1,590,179	79,220	19%
Network user imbalance shorts	6,767,107	353,362	81%
Sub-total	8,357,286	432,582	
<b>Financial debits to neutrality</b>			
TSO system buys	2,421,911	131,811	28%
Network user imbalance long	6,169,071	307,380	72%
Sub-total	8,590,982	439,191	
<b>Net</b>	-233,696	-6,609	
Net neutrality per unit of market volume		-0.02	EUR/MWh
Net adjusted neutrality per unit of market volume		0.01	EUR/MWh

- The **neutrality account is built-up** with the **neutrality indicators** included in the BAF. Those measure the traded volumes and prices associated with TSO balancing actions and the network users' net imbalance payments.
- The **neutrality account** is particularly relevant, as it serves as a starting point for analysing the resultant costs of a balancing regime. High or low net adjusted **neutrality rates require regulatory attention** and may call for a closer national assessment.
- It is to be noticed that not all relevant costs may be visible via neutrality accounting (for example, a tight management of physical flows may lead to extra costs for the network users, which cannot be measured via neutrality account).

# BAF indicators reflect both performance and the diversity of national balancing features

- The indicators' results shown in this presentation (see [sections 4.1 to 4.3](#)) aim at comparing the performance of the different national balancing systems. ACER emphasises that these results need however to be put into perspective, as:
  - the results of the indicators cannot be assessed without reference to the underlying national policy decisions that influence the design of the balancing regime;
  - certain indicator values might only raise concern when considered in the context of their interaction with others.
- Furthermore, the indicators are often affected by:
  - network topologies and physical capabilities;
  - the state of local short-term wholesale market development and availability of flexible gas resources;
  - the role assigned to TSOs or other relevant actors, as implemented in the national regulations.

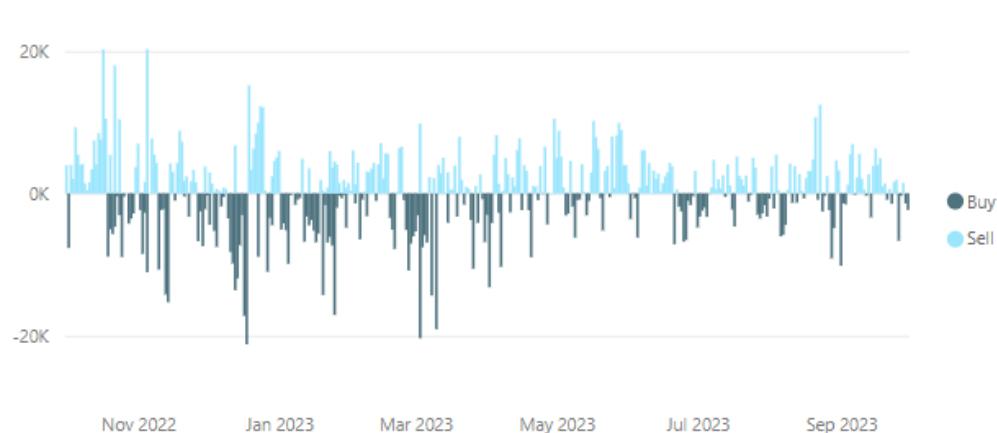
More examples on the next slide...

# Examples of aspects that can impact BAF indicators' results

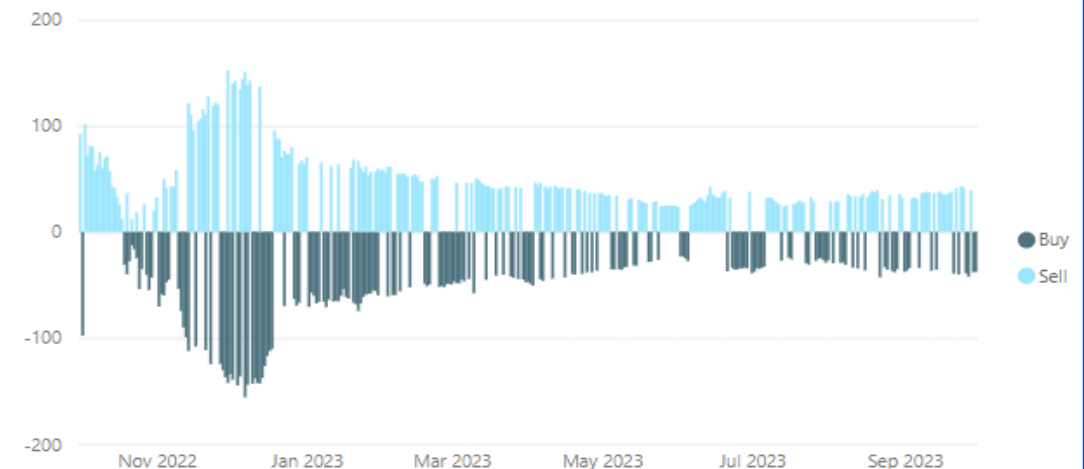
**Example 1. Commercial activity:** A lower number of TSO balancing actions (section 4.1) could intuitively suggest higher commercial activity by market participants in a national balancing system. However, residual TSO balancing can coexist with limited commercial activity if the system is balanced mainly using physical resources.

**Example 2. TSO actions and its variation impact the neutrality account:** TSOs balancing actions occurrence might vary across the year. As TSO selling activities generate a cashflow into neutrality (revenue), whilst TSO buying activities generate a cashflow out of neutrality (cost), a high variation in balancing actions prices, could have an impact on the build-up of the neutrality account. (The same logic applies to the variations observed in the network users' imbalances.)

**Volume of TSO balancing transactions (GY 2022-2023)**



**Average price of TSO balancing transactions (GY 2022-2023)**



# 4. Highlights: gas balancing indicators

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*Observations from the indicators and the comparison of the national balancing zones year-on-year*



# 4.1 TSOs' balancing actions

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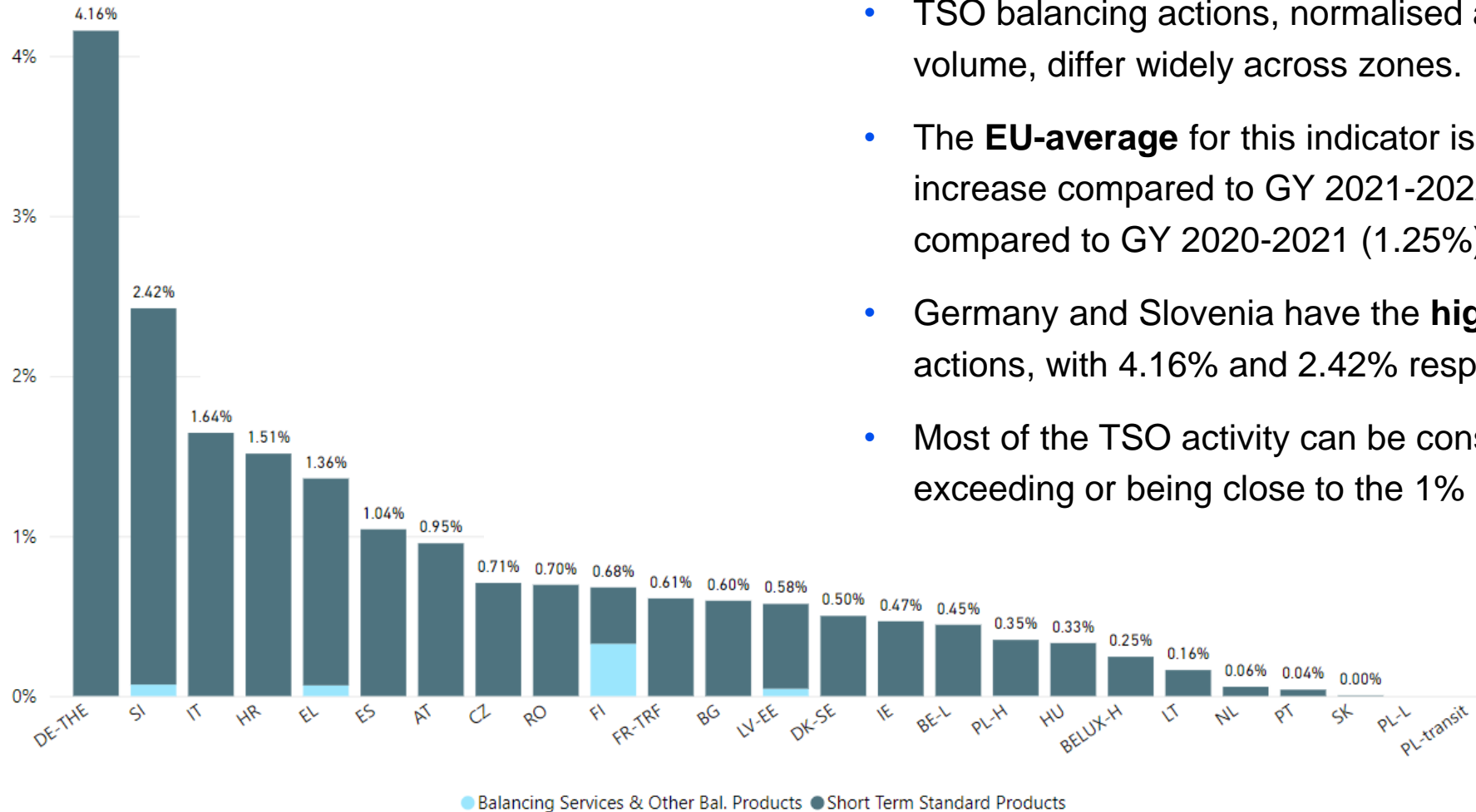
*Overview of results of TSO actions in the Gas Year 2022-2023 and relative year-on-year changes*

## Relevance/purpose of indicators on TSO balancing actions

- Provide a measure of the extent to which a TSO can be considered residual.  
A “low” level (< 1%) might be considered as residual (depending on the balancing regime design), but the ‘low’ levels may not always coincide with well-functioning balancing regimes.
- TSOs' balancing actions contribute to the build-up of the neutrality account.

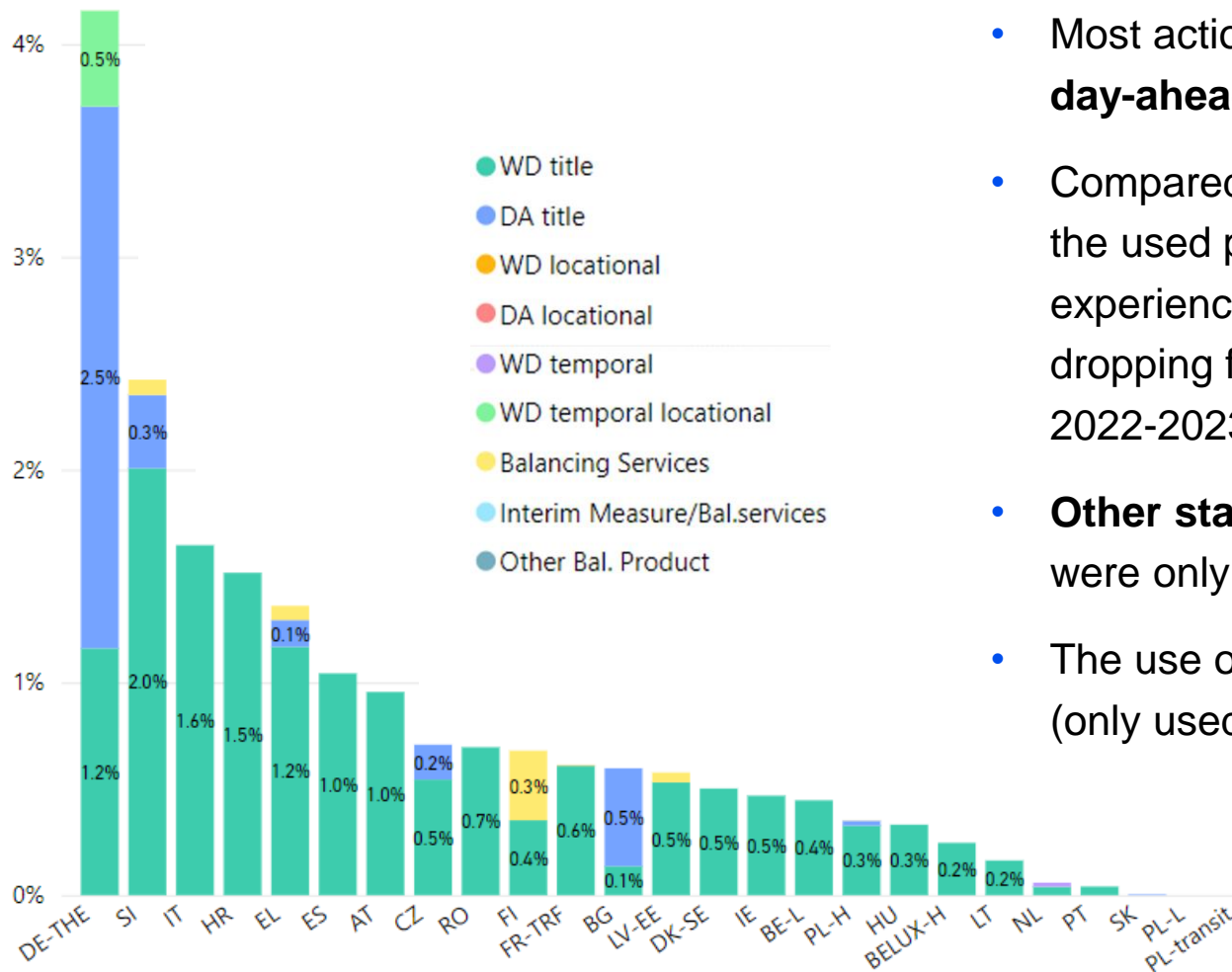
The definition of each Balancing Analytical Framework indicator can be found in ACER's Second Balancing Implementation Monitoring Report ([ACER Report on the implementation of the Balancing Network Code \(Second edition\) Volume I](#)) and in the [User Manual](#) of the gas balancing monitoring dashboard.

# Total TSO balancing actions quantities as a share of market volumes



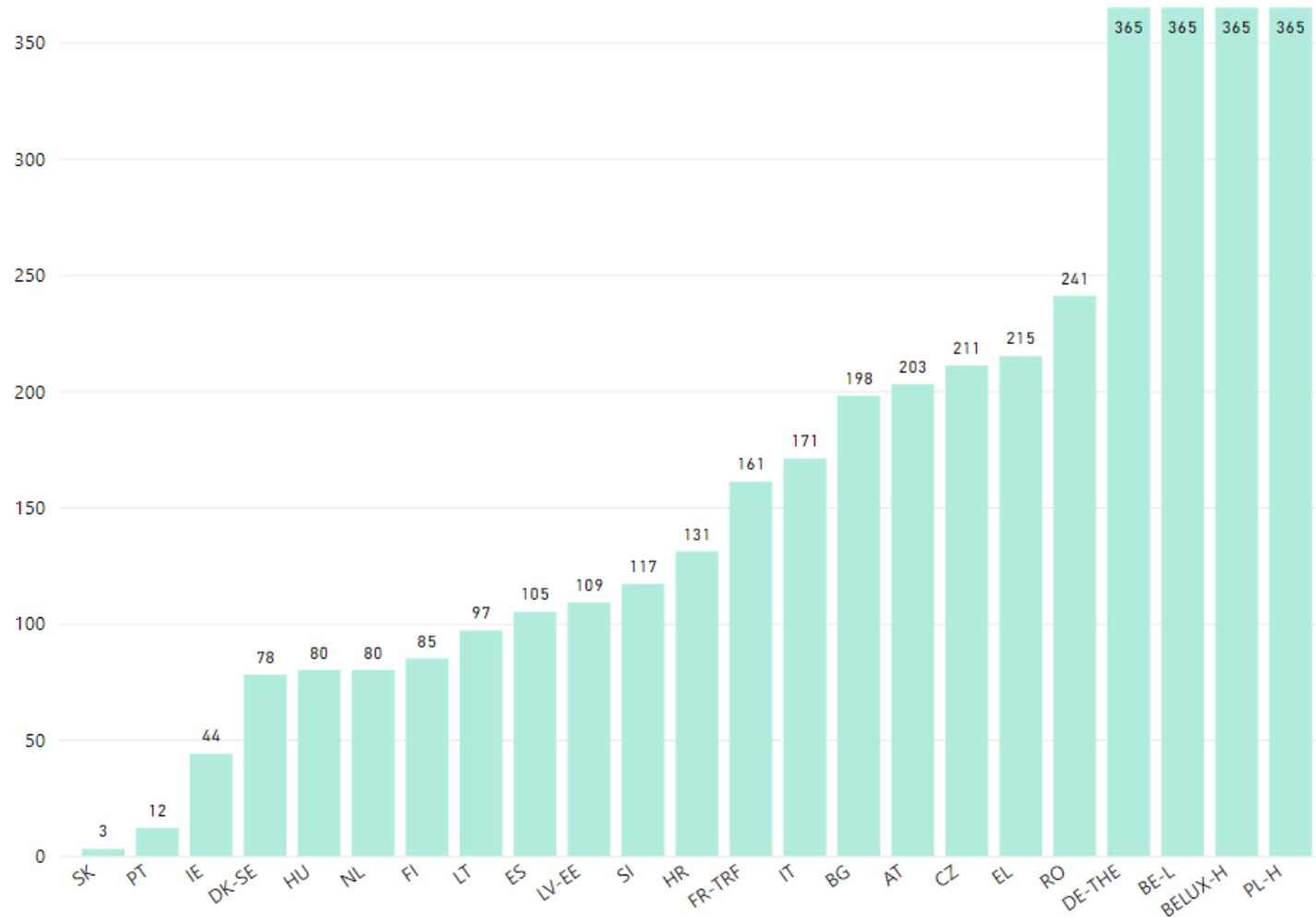
- TSO balancing actions, normalised as share of the market volume, differ widely across zones.
- The **EU-average** for this indicator is 1.19%, and shows an increase compared to GY 2021-2022 (1.12%) and a decrease compared to GY 2020-2021 (1.25%).
- Germany and Slovenia have the **highest share** of balancing actions, with 4.16% and 2.42% respectively.
- Most of the TSO activity can be considered **residual** as not exceeding or being close to the 1% market share threshold.

# The products used for TSO balancing



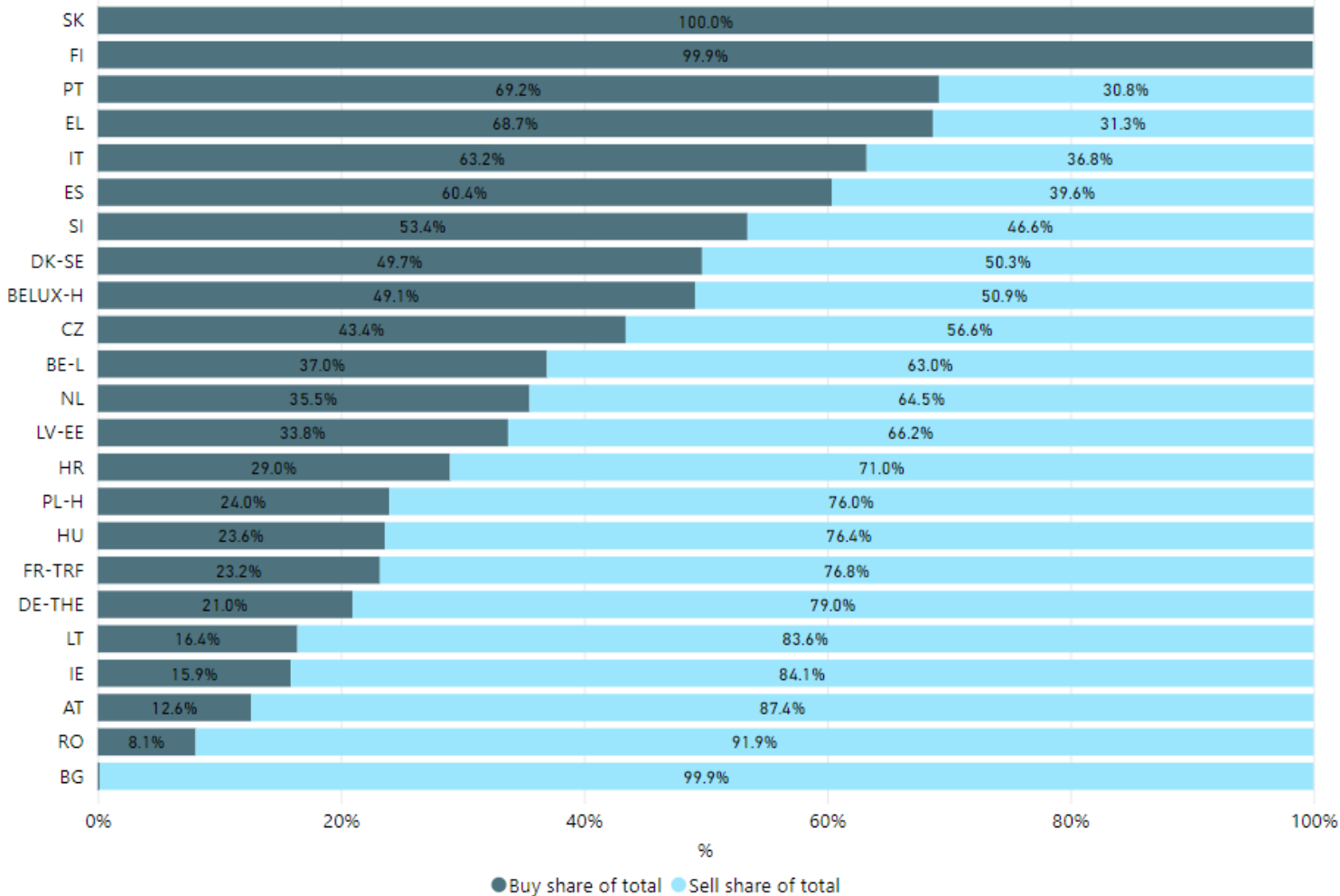
- Most actions are taken by **within-day title** products, followed by **day-ahead title** products.
- Compared to GY 2021-2022, there is no significant change in the used product types, except for Finland. Notably, Finland experienced the largest **decrease** in **balancing actions**, dropping from 4.41% in GY 2021-2022 to just 0.68% in GY 2022-2023.
- **Other standardised short-term products** than **title products** were only used in DE-THE, FR-TRF and NL.
- The use of **balancing services** remained at a residual level (only used in DE-THE, SI, EL, FI, LV-EE and PL-H).

# Number of days when balancing actions took place



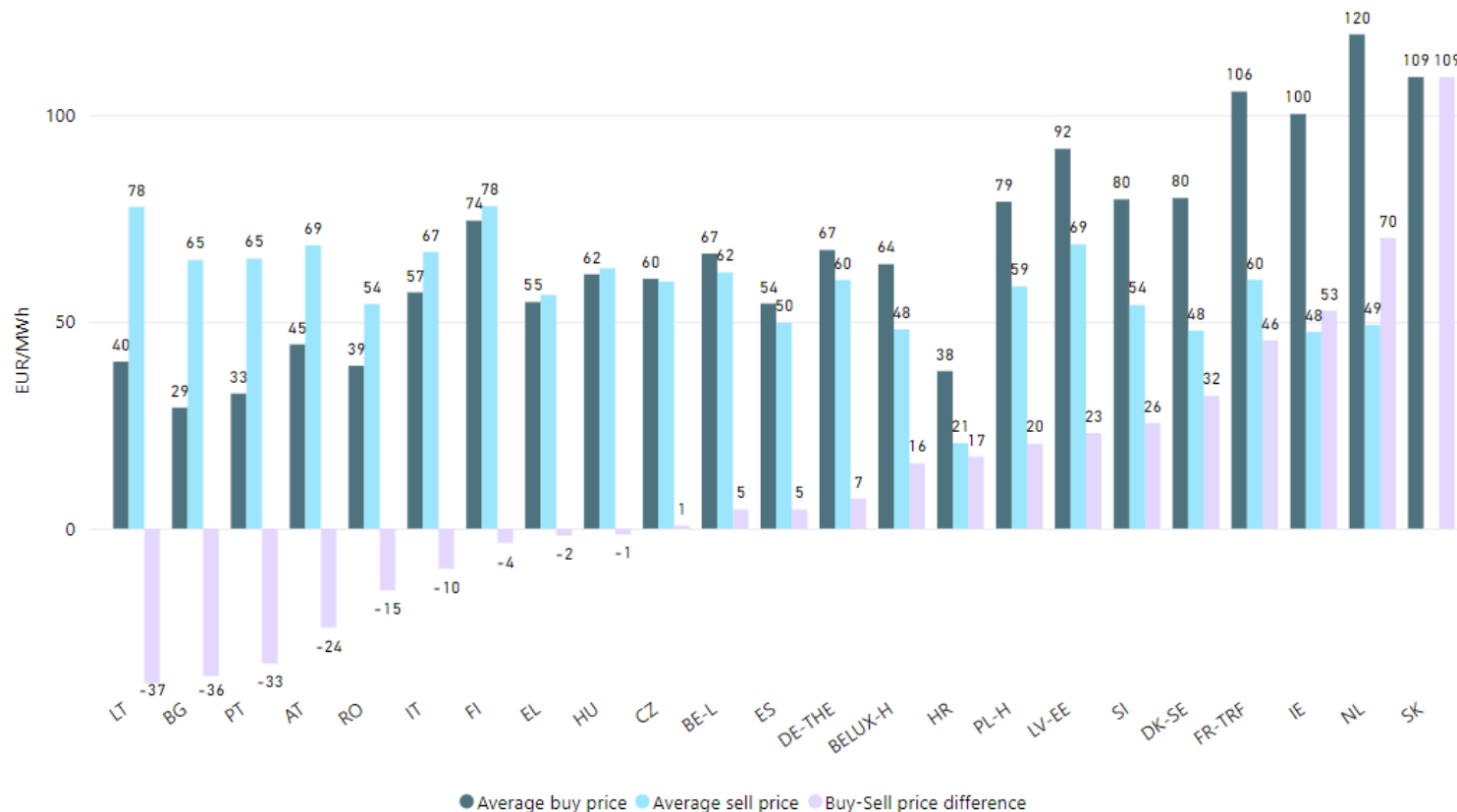
- Different balancing regimes designs may result in different frequencies of balancing actions (measured in number of days) .
- The **total sum** of days with balancing actions was 3,801 in GY 2022-2023, representing a **13% decrease** compared to the 4,385 days in GY 2021-2022.
- Four zones (DE-THE, BE-L, BELUX-H, and PL-H) experienced balancing actions on a **daily basis**. In contrast, markets like Spain and Denmark-Sweden took actions moderately on 105 and 78 days respectively.
- The most **notable reduction** in balancing days occurred in **Finland**, with a decrease of 156 days, followed by the **Czech Republic**, which saw a reduction of 107 days compared to GY 2021-2022.

# TSO split between buy and sell actions



- Most zones show an asymmetry in the buy and sell actions of TSOs, but four balancing zones show reasonable symmetry (in the range of 45-55%).
- Comparing GY 2022-2023 with GY 2021-2022, there is a significant **increase** in the average use of **TSO sell actions**, rising from 58% to 68%. This rise continues the upward trend observed since GY 2020-2021 (48%).
- Regimes with extreme asymmetries should investigate the reasons behind this outcome and assess whether this might imply some dysfunctionality regarding the incentives of network users to act.

# Average buy & sell prices of TSO balancing actions



- Despite a **decrease in prices** of up to **50%** compared to the previous GY, the TSO's balancing prices remained more than double to the levels observed two years before.
- The **highest average buy price** (120 EUR/MWh) can be observed in the Netherlands. The **highest average sell price** can be observed in Lithuania (78 EUR/MWh).
- A reduced difference between average buy and sell price often points to the existence of more liquid trading markets/platforms in the different zones, and the ease for network users to more easily balance themselves.

# 4.2 Network users' imbalances

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*Overview of results of imbalance positions in the Gas Year 2022-2023 and relative year-on-year changes*



## Relevance/purpose of indicators on network users' imbalance

- Provides a measure of how well the network users balance themselves.
- Broader market context may impact the possibility of network users to successfully being balanced; and relates to their ability to access information or flexible gas sources to balance themselves.
- Network Users' Imbalances also contribute to the build-up of the neutrality account.

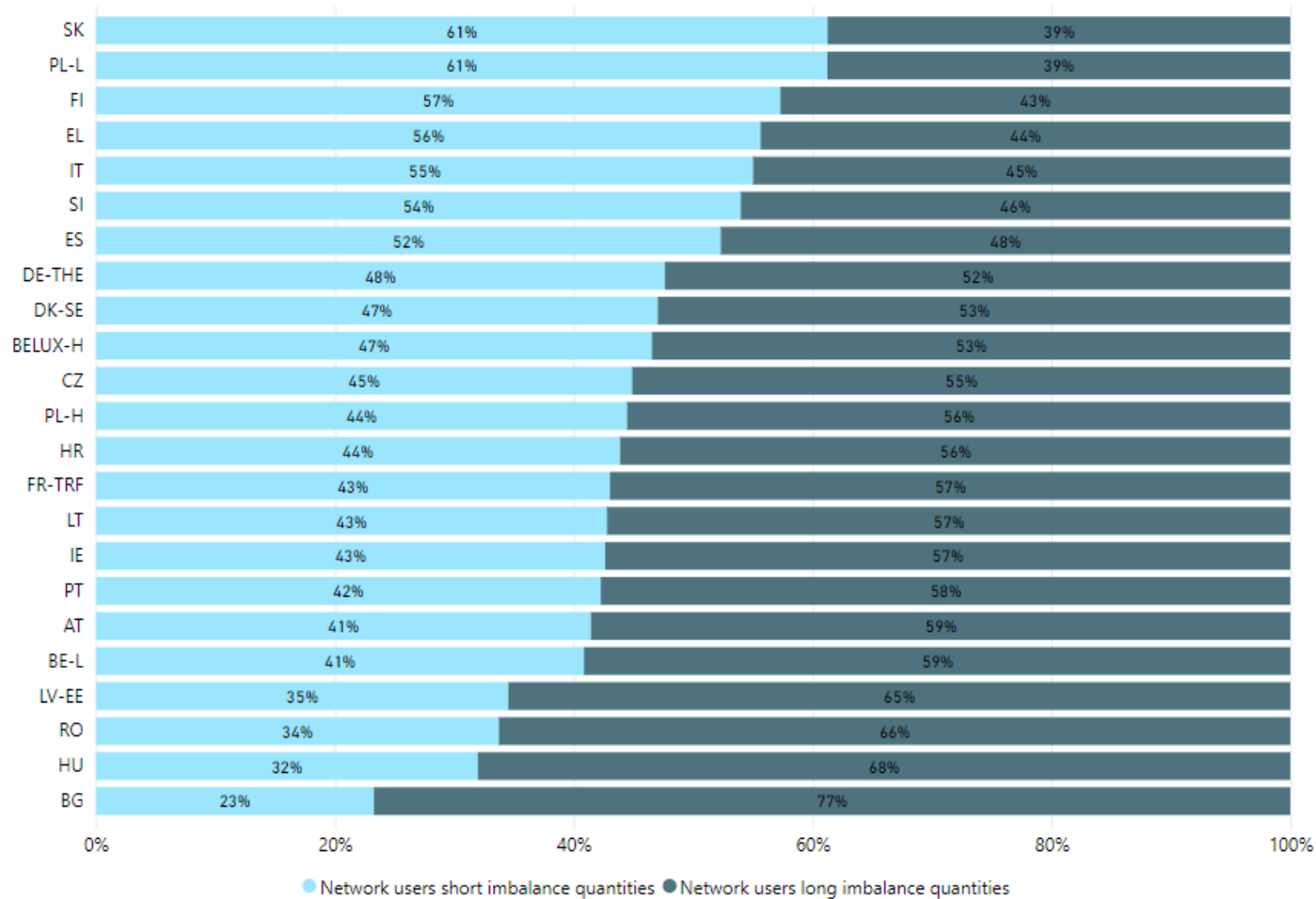
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# Total imbalance quantities as a share of market values



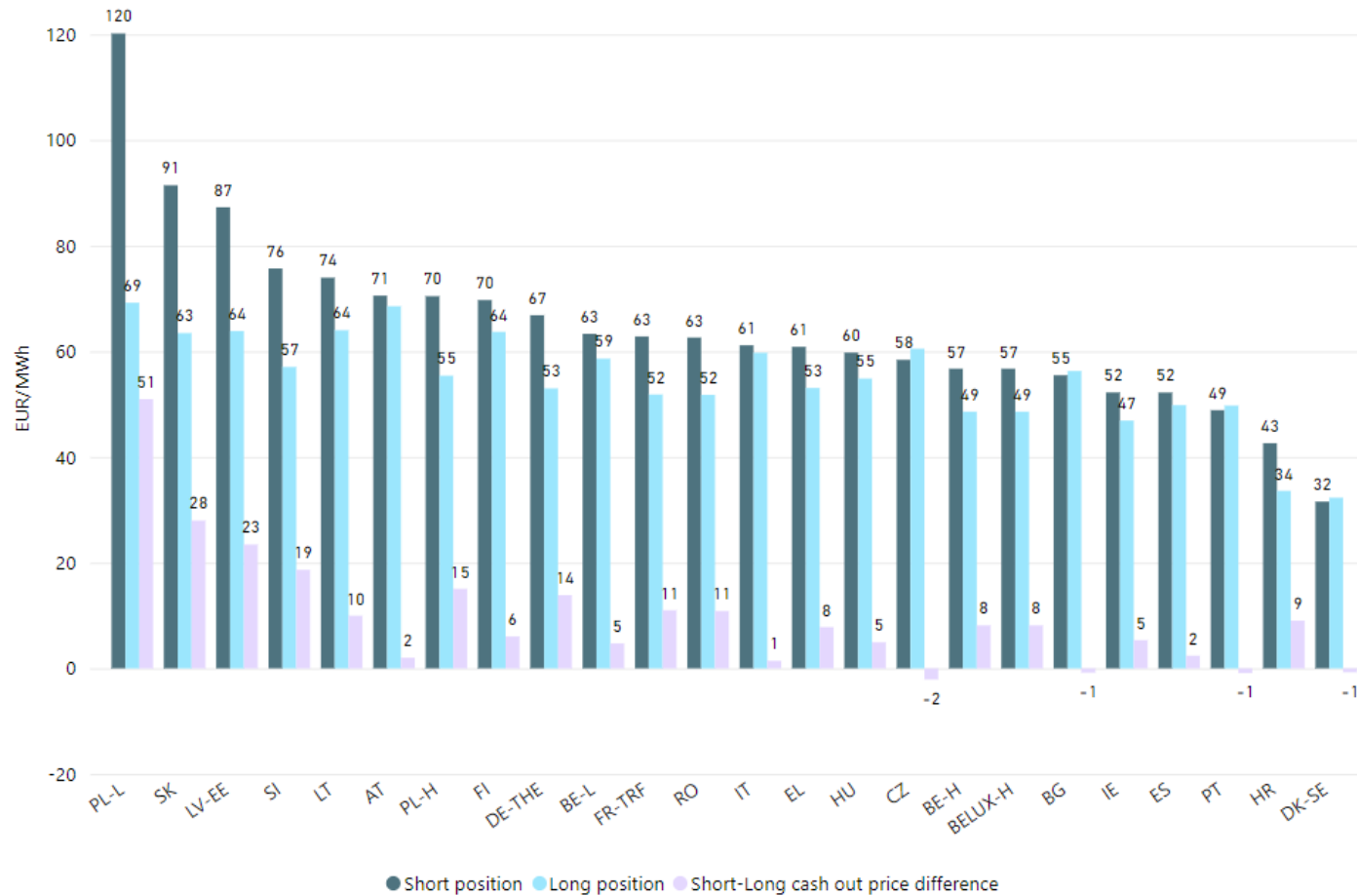
- The **average total imbalance quantities** as a share of market volumes has slightly **increased** to 2.33% in GY 2022-2023, compared to 1.99% in GY 2021-2022.
- Italy has **the highest imbalance quantities**, at 9.85%, almost twice as much as Denmark-Sweden (5.26%) the next balancing zone in line. In both zones the values declined compared to the previous GY. Outliers in the imbalance quantities indicator may point to limited trading opportunities and may require further scrutiny.
- Imbalance quantities as a share of market values increased significantly in IT, HR, SI, EL in comparison to GY 2021-2022 and decreased in DK-SE, FI in comparison to GY 2021-2022.

# Network users' short & long imbalance quantities as a share of total imbalance cash-out



- Most zones show a slight asymmetry between network users' short and long imbalance quantities.
- The **average network users' imbalance long positions** have **decreased** from 52% to 50% compared to the previous gas year.
- The **asymmetry of short and long imbalance quantities** has shifted generally closer to a 50:50 split-compared to the GY 2021-2022 with seven balancing zones within the 45-55% symmetry range.
- The relation between TSO actions and network users' Imbalance may provide additional insights.

# Average imbalance cash out prices



- **Average short and long imbalance cash-out prices decreased** by up to 50% compared to the previous gas year. This trend is comparable to that observed in the wholesale market.
- Unlike the previous gas year, when average long cash-out prices were generally above 100 EUR/MWh, this gas year has seen lower price levels.
- The price differences are moderate in 7 balancing zones, and such differentials assist reaching lower neutrality costs. High differences may require a closer assessment, while acknowledging that some constraints might have been triggered by the energy crisis.

# 4.3 Neutrality

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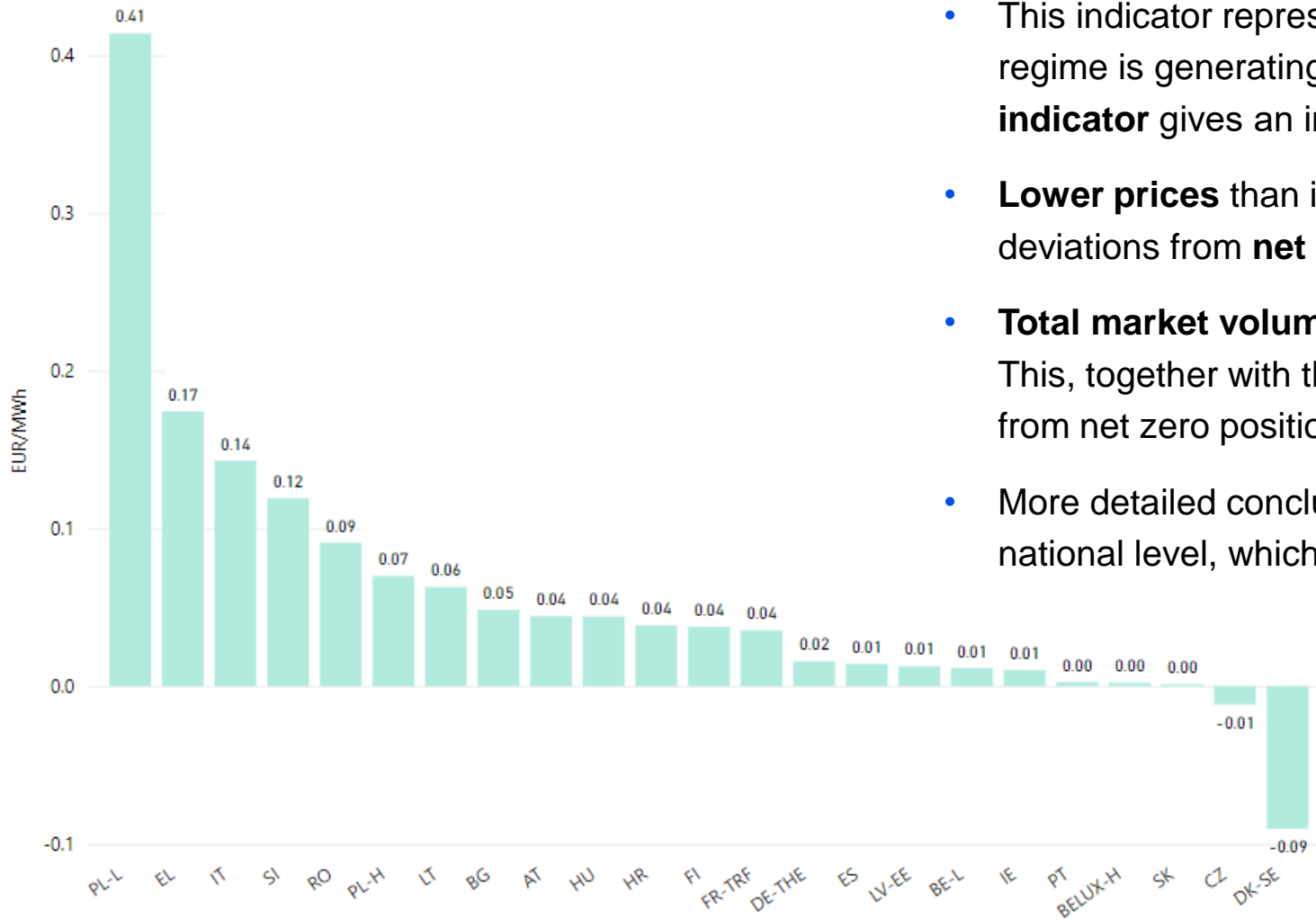
*Overview of results of neutrality positions in the Gas Year 2022-2023 and relative year-on-year changes*

## Relevance/purpose of indicators on neutrality

- This indicator facilitates the understanding of the underlying cost/revenue generated by the functioning of the balancing regime.
  - A net positive value indicates that neutrality has generated a cash surplus that should then lead to a refund, or credit, to be attributed to network users.
  - Where the net value is negative, it implies a cost to be recovered via an attribution to network users.

The definition of each Balancing Analytical Framework indicator can be found in ACER's Second Balancing Implementation Monitoring Report ([ACER Report on the implementation of the Balancing Network Code \(Second edition\) Volume I](#)) and in the [User Manual](#) of the gas balancing monitoring dashboard.

# Net adjusted neutrality per unit of market volumes



- This indicator represents whether the operation of the balancing regime is generating a **surplus** or a **deficit**. The **size of the indicator** gives an insight on the balancing regime's performance.
- **Lower prices** than in GY 2021-2022 have contributed to smaller deviations from **net zero positions**.
- **Total market volumes** have stabilised since GY 2021-2022. This, together with the lower prices, resulted in smaller deviations from net zero positions compared to the previous GY.
- More detailed conclusions require further investigation at the national level, which is not in scope of this analysis.

# 5. Conclusions and recommendations

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1. Balancing prices (both for TSOs and network users' activity) have substantially decreased compared to the previous GY 2021-2022, aligning with the trend observed in wholesale gas markets. Overall, as the EU gas market conditions gradually adapted to a more favourable new supply & demand equilibrium across 2023, the national balancing systems managed to adjust and stabilise.
2. In that respect, the overall decreasing prices have resulted in lower net neutrality positions, which constitutes a positive market development.
3. Interestingly, TSO balancing actions, as a share of total market volumes, remained stable compared to the pre-crisis period. However, most systems saw an increase in TSO sell actions year-on-year, suggesting the need for further investigations at the national level to assess potential security of supply implications.

- The Agency continuously promotes the application and comprehensive assessment of the indicators that comprise the Balancing Analytical Framework, as they help evaluate the performance of national balancing regimes. The Agency believes that such performance reviews assist policymakers in further refining their existing regimes.
- The Agency recommends that NRAs periodically review the performance of their balancing regimes and assess whether changing circumstances might necessitate a design revision. Generally, NRAs should ensure that the incentives for commercial balancing are adequate and explore enhancements to information systems to facilitate network users' participation. Furthermore, they should particularly reflect on the cost-effectiveness of balancing regimes, taking neutrality indicators into consideration.
- In case of review, public consultations are recommended to collect market participants' preferences, while regional cooperation can help to identify broader optimisation potential and best practices.



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