AURORA ENERGY RESEARCH

Turning the valve: Outlook for Russian gas transit via Ukraine

Prepared by GLO Research

November 2024

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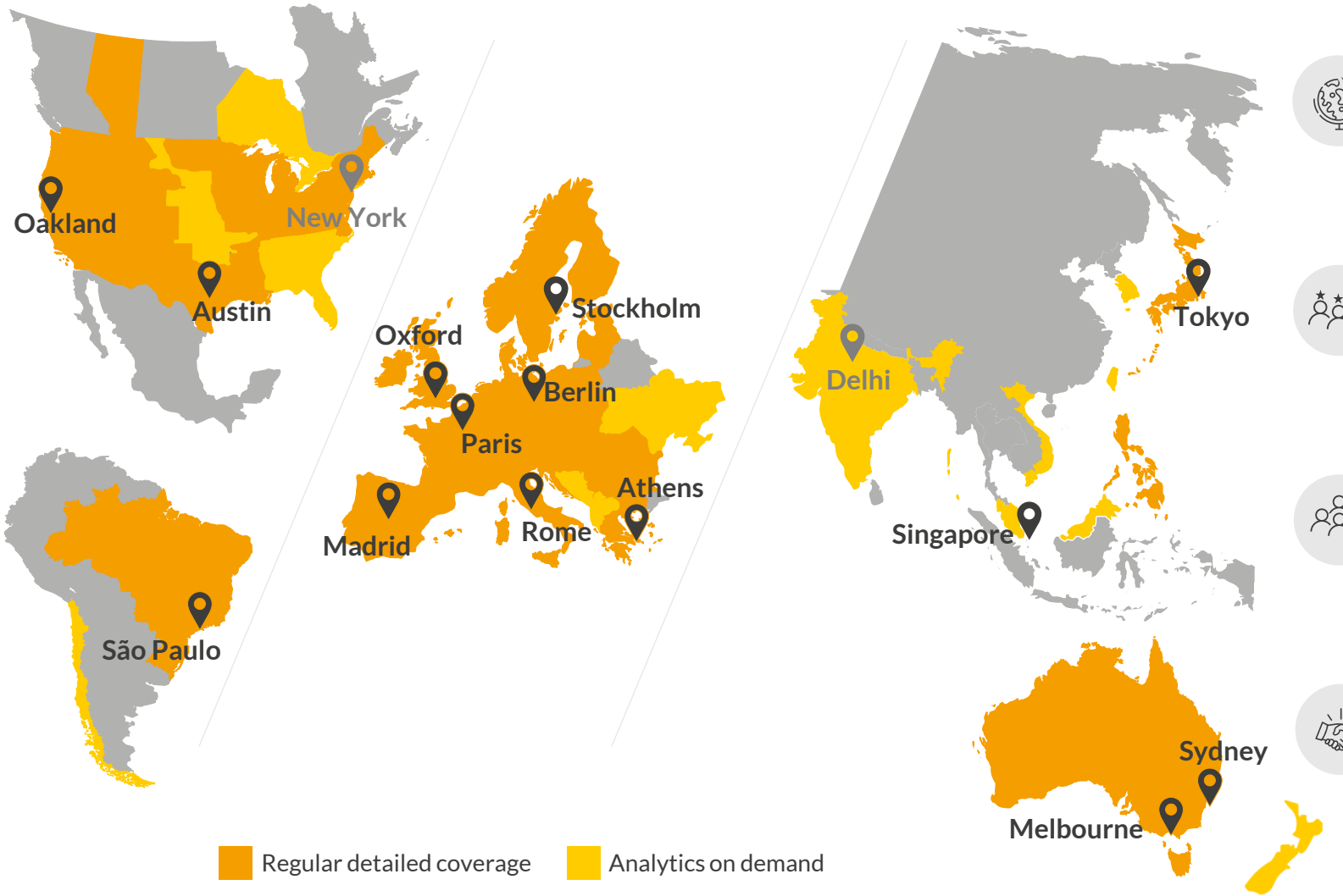

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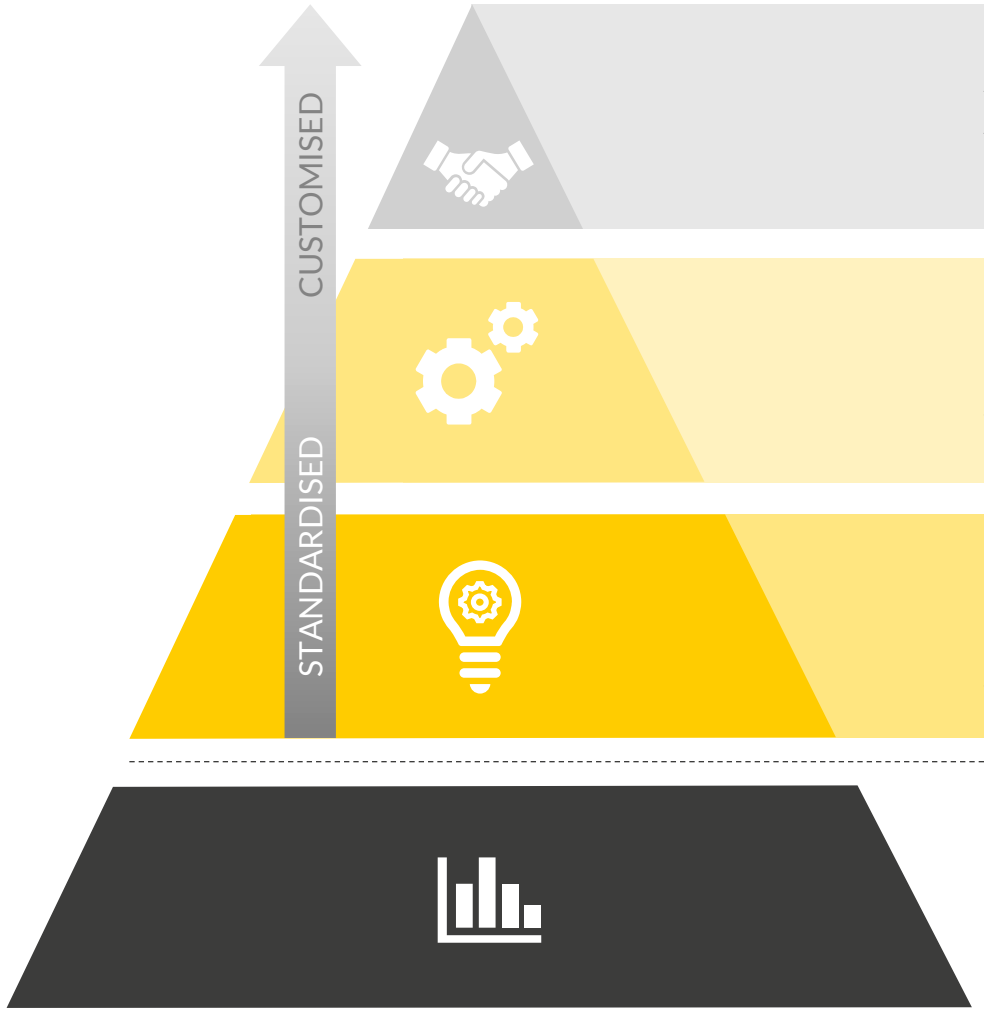

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Source: Aurora Energy Research

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Agenda

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I. Overview of Russian gas flows into Europe and Ukraine transit agreement

II. Impact on the European supply balance compared to Aurora Central

III. Knock-on effects around the world

Poll 1:

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In your view, will an agreement be reached on Ukraine natural gas transit?

% of answers	
8%	A. Agreement will be renewed under current terms
45%	B. Agreement reached that allows for daily bookings, but no long-term contract
14%	C. No agreement, all gas flows stop forever
33%	D. No agreement for now, but gas flows restart after the war in Ukraine ends

Once the EU's largest supplier, Russian pipeline gas now accounts for only 8% of imports — a dramatic shift from nearly 50% in 2019

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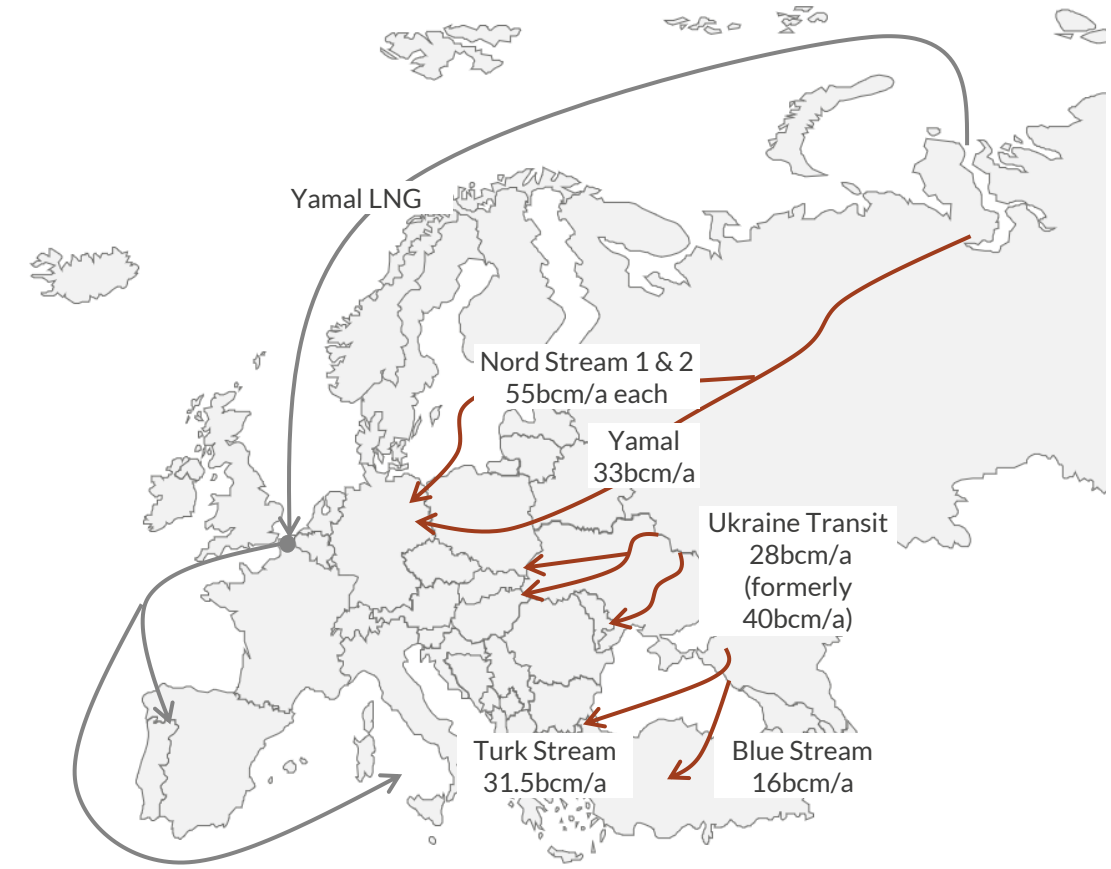
Main Russian gas export routes to Europe[1,2]

bcm

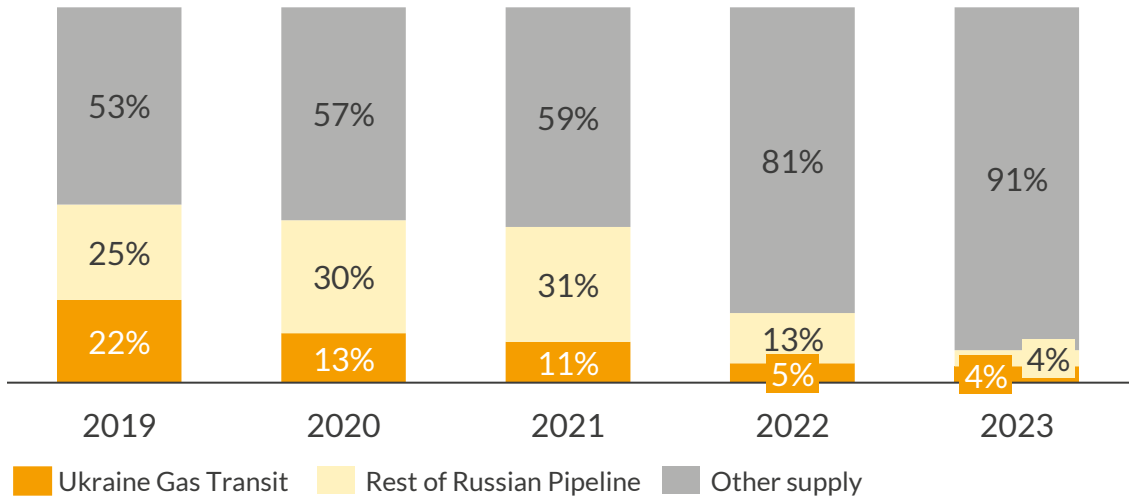


Impact of EU's shift from Russian gas:

- Idle capacity and stranded assets, the prime example being the Nord Stream 2 pipeline. While the pipeline was physically completed in never received the necessary regulatory approval, resulting in substantial sunk costs.
- Russia's strategic leverage and use of pipeline gas as a bargaining tool has diminished.
- International sanctions on Russia limit planned LNG projects, reducing Russia's capacity to redirect its gas to other markets.

Share of Russian pipeline gas in total EU imports

%



1) Shown figures represent annual capacity 2) Includes both currently operational and previously used pipelines

Source: Aurora Energy Research

Ending Russian gas transit via Ukraine means halving Russia's remaining pipeline gas exports to Europe

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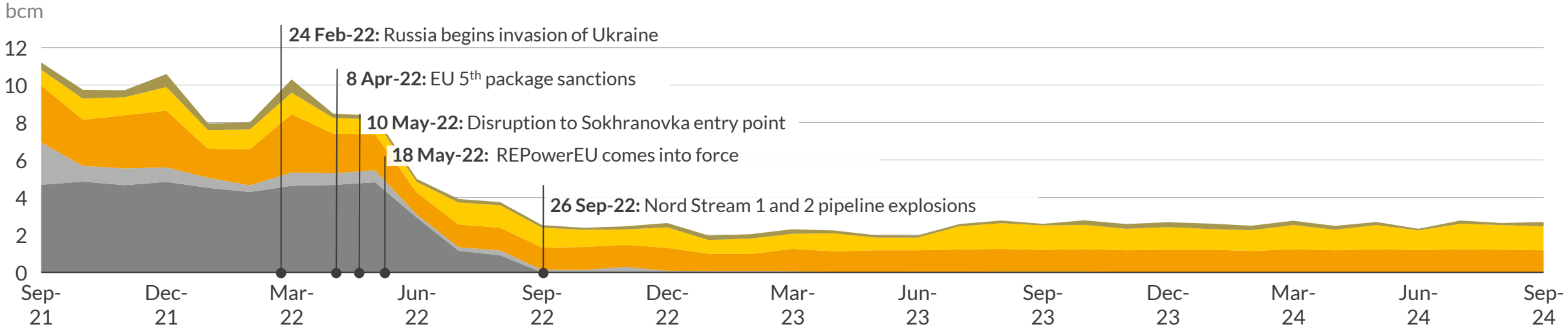
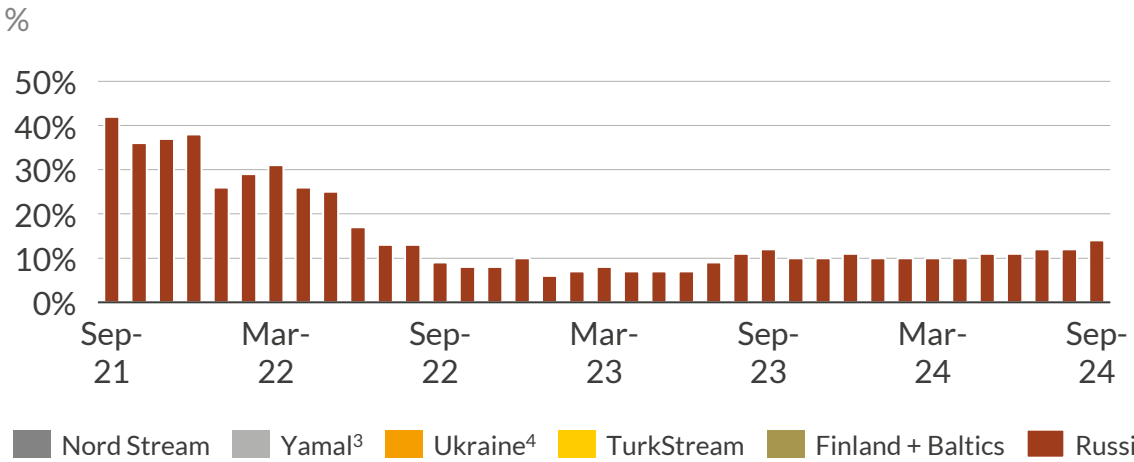
Russian monthly pipeline exports to Europe[1] by main routes



Share of Russian pipeline gas in total European gas imports[2]



Key recent events

- Gazprom informed Austria's OMV that it will suspend deliveries under its long-term gas contract, following OMV's announcement that it would seek to recover more than €230mn after an arbitration ruling. Flows via Ukraine, however, appeared nearly unchanged.
- SPP (Slovakia) signs pilot short-term supply deal for December deliveries with Azerbaijan's SOCAR.
- Ukraine's energy ministry confirmed that there are no ongoing negotiations on Russian or any other transit through Ukraine.

1) Europe includes EU-27, the UK, and Switzerland, but excludes Turkey. 2) The share does not include production and storage withdrawals/injections. 3) Excludes non-Yamal flows from Poland to Belarus. 4) Includes Sokhranovka (until May 2022) and Sudzha entry points.

Sources: Aurora Energy Research, ENTSO-G

Europe's LNG imports from Russia have increased, but Western sanctions have slowed buildout and exports from new terminals

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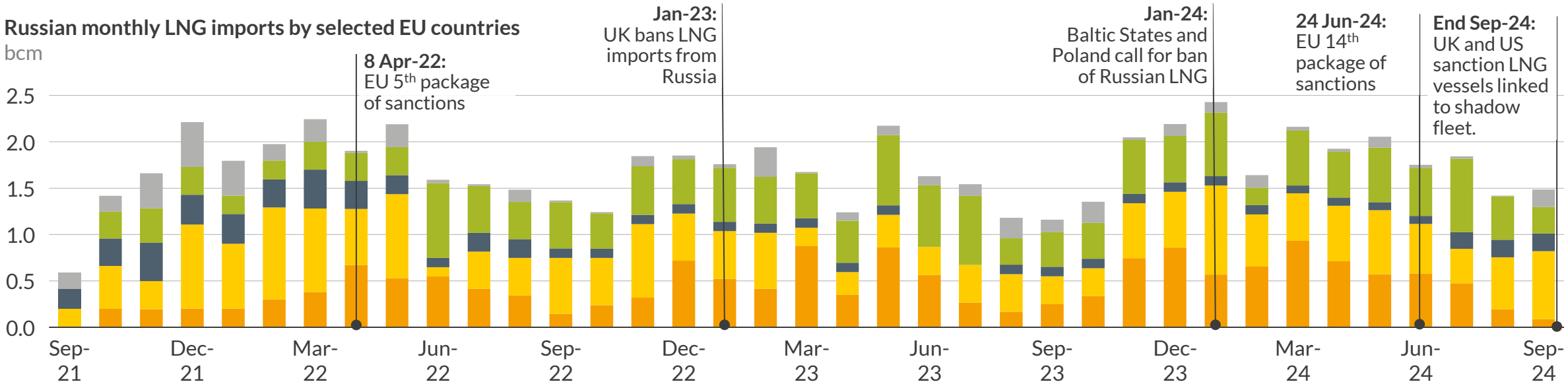
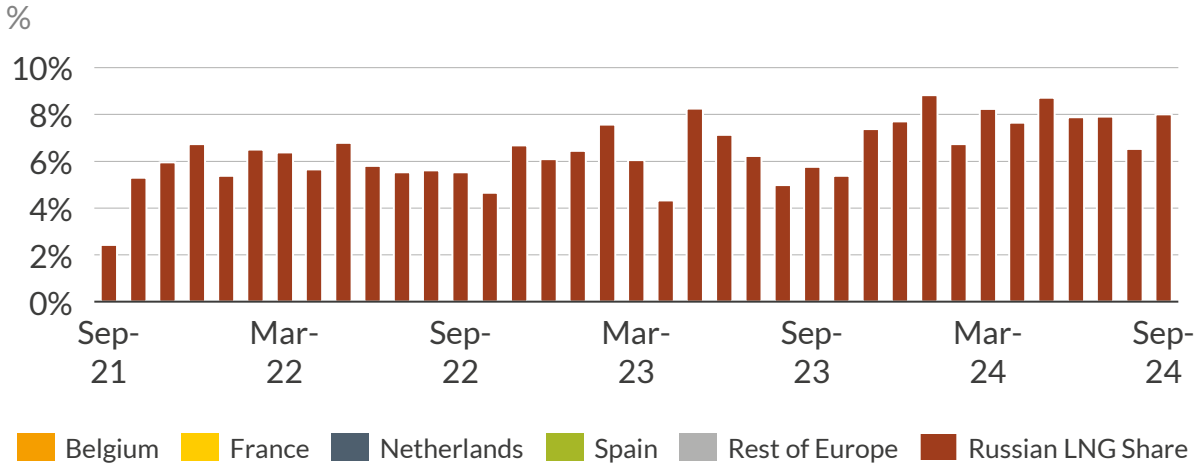
Russian monthly LNG imports by selected EU countries



Share of Russian LNG in total EU imports[1,2]



Implications of Western sanctions:

- Ban on transhipment services, aiming to prevent the use of EU facilities as transit for Russian LNG to non-EU destinations.
- Investment and export restrictions limiting the export of services and goods to Russian LNG projects under construction.
- Ban on importing Russian LNG through terminals not connected to the EU natural gas interconnected system.

1) Europe includes EU-27, the UK, and Switzerland, but excludes Turkey. 2) The share does not include storage withdrawals/injections in the supply mix.

Sources: Aurora Energy Research, Refinitiv

Possible pathways for Russian gas transit via Ukraine from 2025

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End of 2024

Ukraine transit agreement

2025

Agreement expires

- EU to find alternative sources
- Price volatility in the short-term
- Knock-on effects in other geographies

Agreement reached

Possibilities:

- Renewal under same terms
- Renewal under alternative terms
  - Short-term agreement
  - Virtual transportation via swaps
  - Daily bookings

Ukraine and Russia keep income from transport fees and sales, respectively

Less risk for dependent EU countries

Beyond 2025

The Russian LNG question

- Ban Russian LNG imports outright
- Allow Russian LNG imports
- Middle-ground approach

Challenges

- How can a new agreement be reconciled with the non-binding target to decouple from Russian gas by 2027?
- Could new US LNG liquefaction projects coming online after 2025 displace Russian gas?
- With decreasing demand expected in Europe, what should be the duration of a new agreement?
- If transit is to continue via swaps, where will the gas come from?

Source: Aurora Energy Research

Poll 2:

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In case a transit agreement is not reached, what supply source could offset the lost gas:

% of answers	
27%	A. Pipeline supply from Norway, North Africa, and the Southern Gas Corridor (Azerbaijan)
8%	B. Russian LNG
60%	C. US LNG
5%	D. No replacement, resulting in demand destruction

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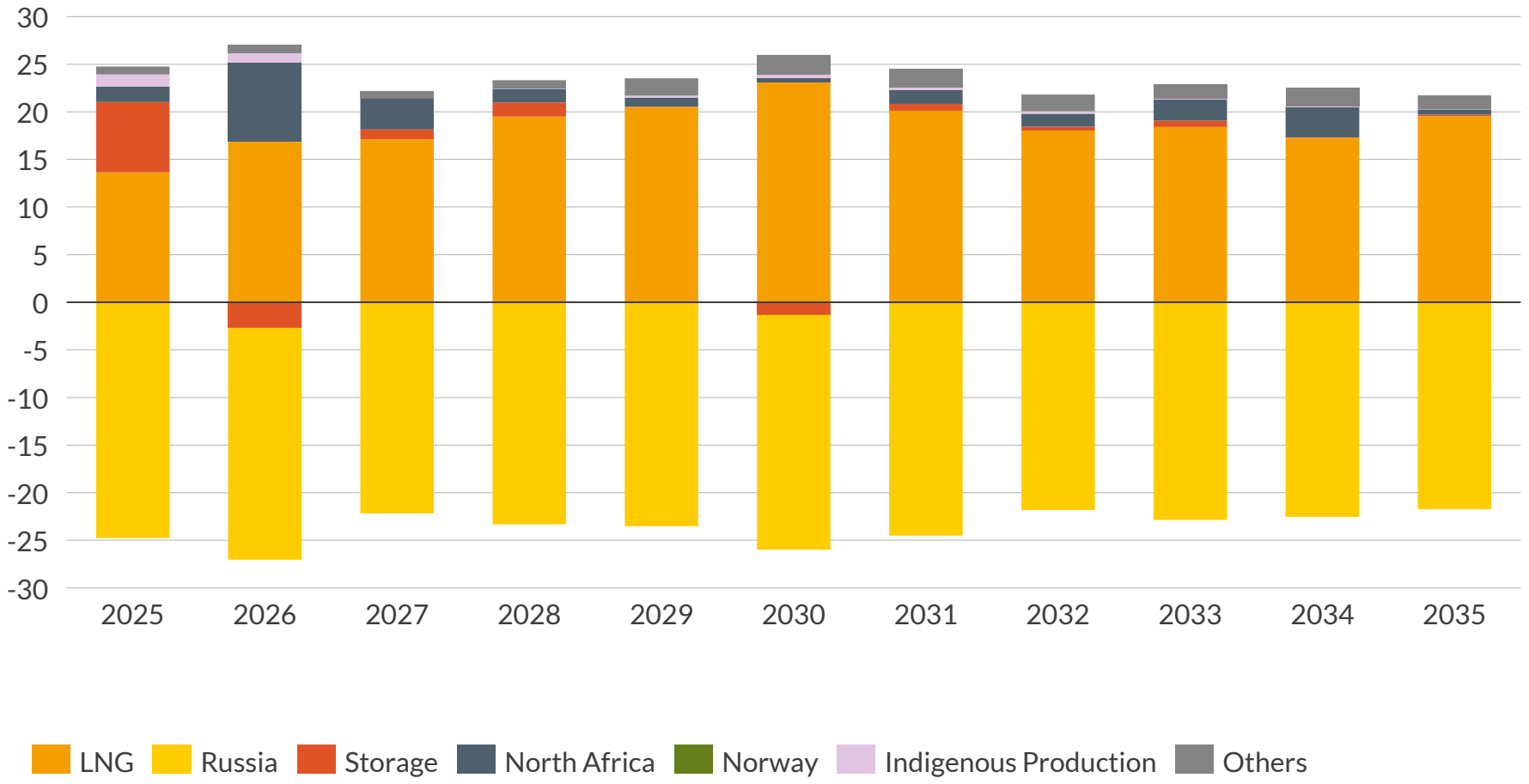
If Ukraine gas transit stops on 1 Jan 2025, lost Russian pipeline gas would be largely offset by increased LNG imports

Mid-term changes in European[1] supply balance vs Aurora's Central forecast
bcm



1) Europe includes EU-27, the UK, and Switzerland, but excludes Turkey.

Source: Aurora Energy Research

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Key changes in European balance

- In our alternative scenario, the loss of transit in 2025 is mainly offset by storage withdrawals and redirected LNG flows
- From 2026 onward, North African pipeline supply partly displaces storage withdrawals
- As new liquefaction projects in the US come online, LNG compensates for reduced pipeline supply from Russia
- Between 2025-2035, we expect LNG to account for 82% of the lost Russian pipeline supply, with North Africa contributing an additional 10%. The remainder is covered by an uptick in domestic production and other sources

Redirecting US LNG from Asia offsets Ukraine transit loss in 2025, with no increase in Norwegian supply

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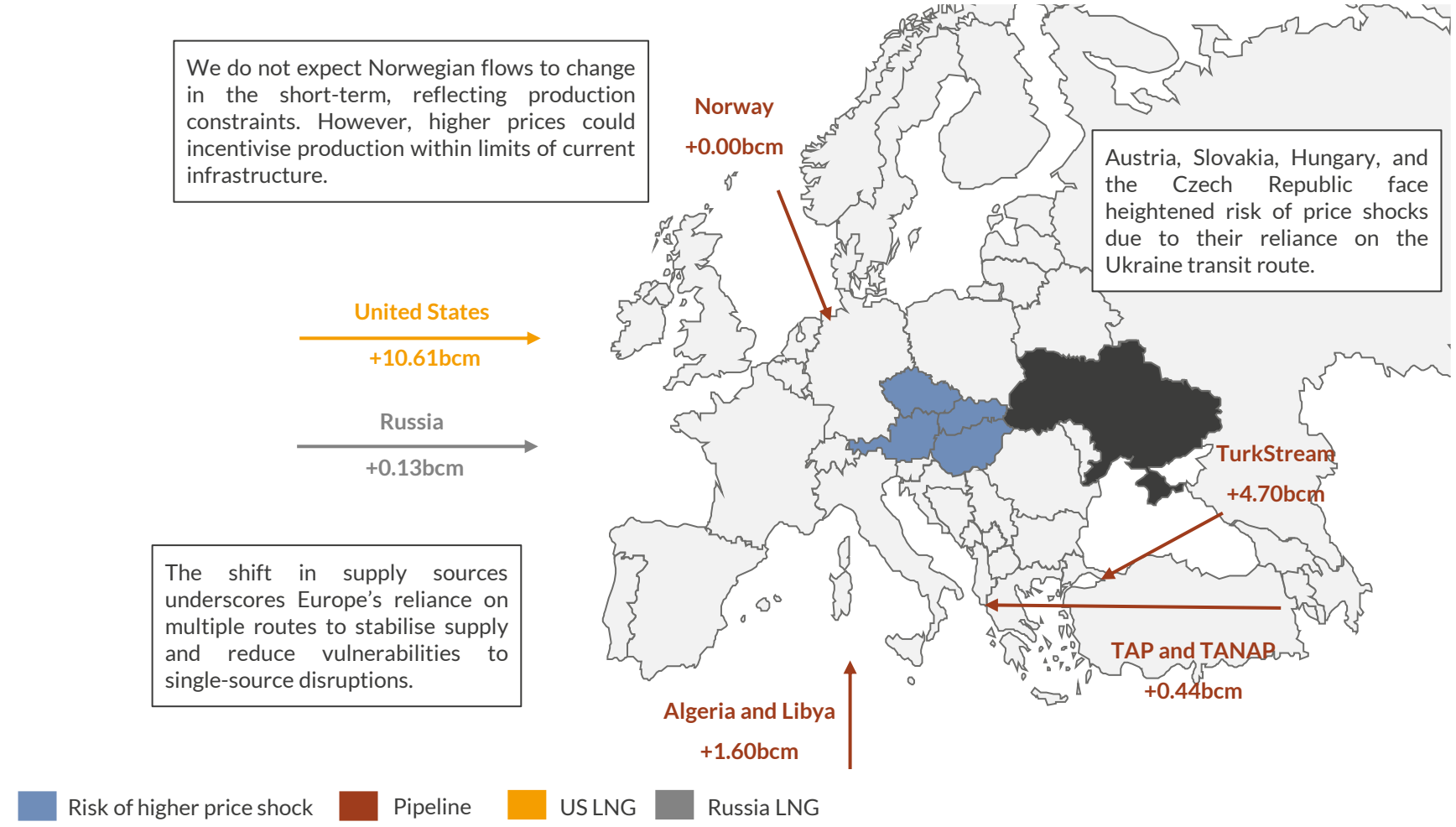
Changes in gas flows by major import sources in 2025 vs Central
bcm



- Russia seeks alternative route for its gas through TurkStream route with options of additional gas flowing to Turkey and Southeastern Europe
- Azerbaijan becomes a bigger supplier via TANAP and TAP corridor, supplying 0.44 bcm more than in Central in 2025
- While constrained in 2025, TAP and TANAP undergo capacity expansions of 16 bcm and 10 bcm, respectively, support the corridor's increasing importance
- Production constraints and demand growth in North Africa in 2025 prevent significant additional exports to Europe

Source: Aurora Energy Research

Alternative pipeline routes and higher LNG flows via Germany compensate for the loss of Ukraine transit in the mid-term

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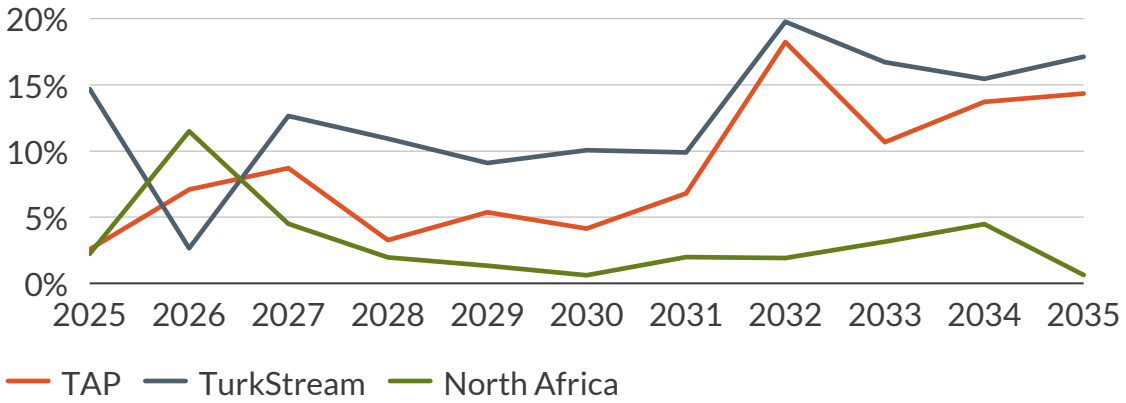
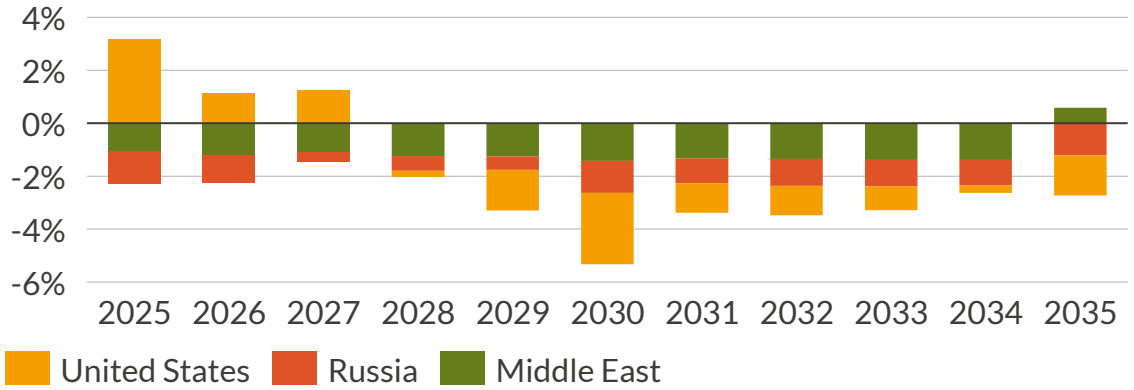
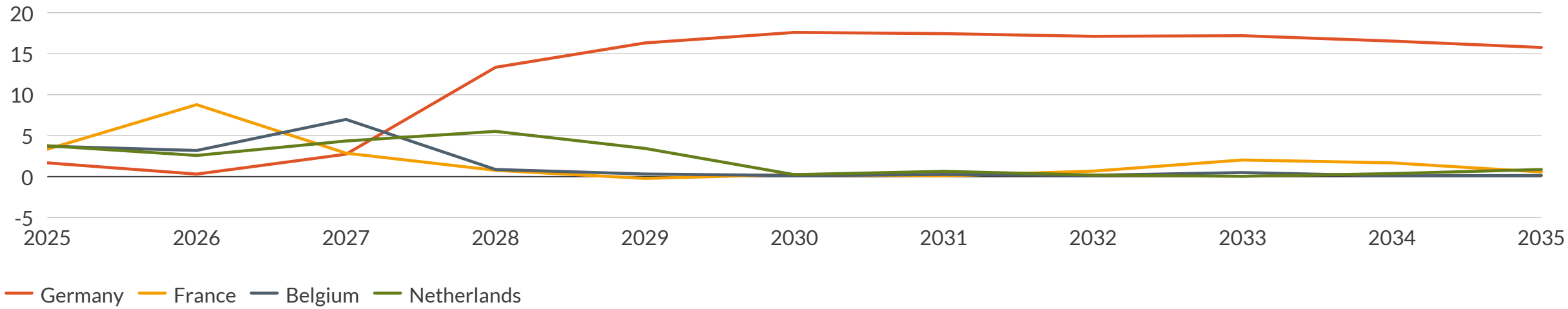
Selected routes[1] into South and Eastern Europe – changes vs Central
Utilisation rate



Share of LNG imports by major sources to Europe – changes vs Central
Percentage points



LNG sendout in selected North West Europe countries – changes vs Central
bcm



1) TAP=Trans Adriatic Pipeline; North Africa includes Algeria and Libya

Source: Aurora Energy Research

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Ending Ukraine transit drives a shift in global LNG flows in 2025, with limited upside for Russia in the mid-term

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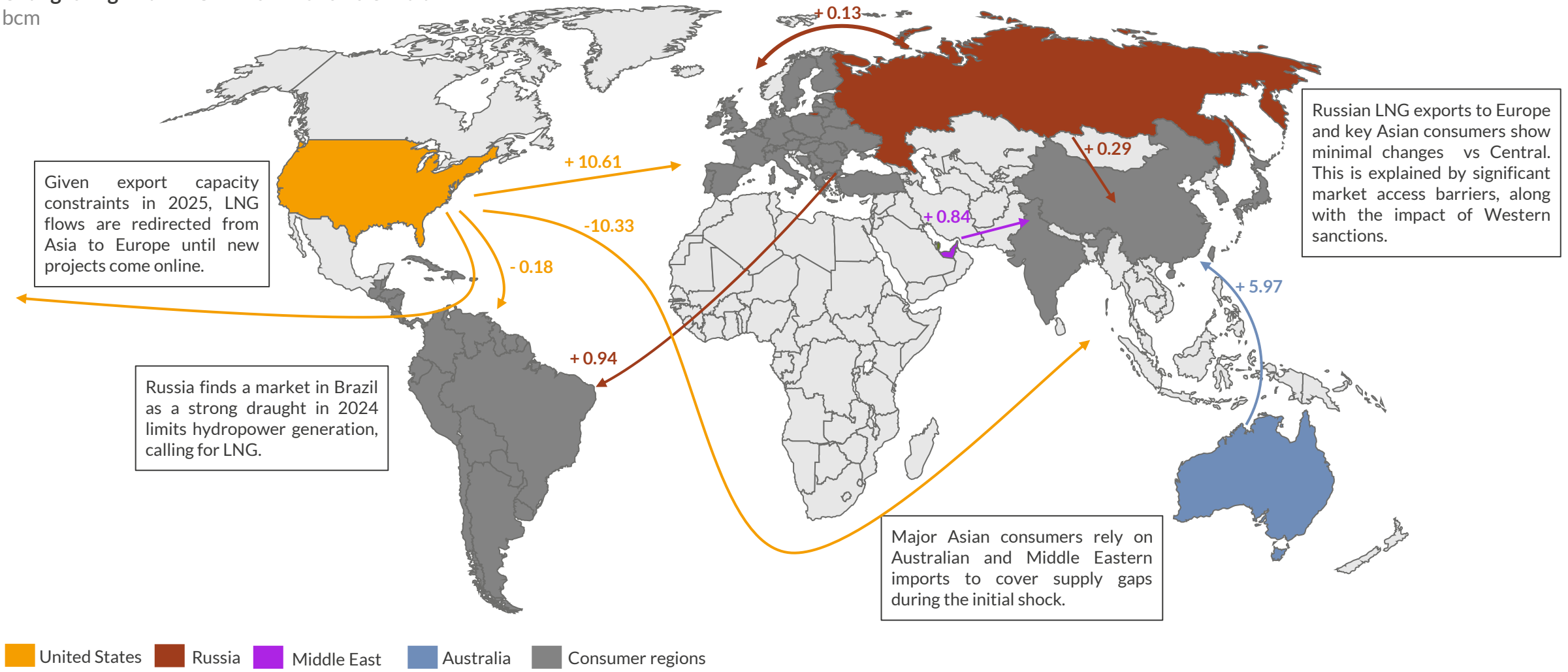
Changes in global LNG flows in 2025 vs Central[1]

bcm



1) Shown LNG balances are for major global exporting countries.

Source: Aurora Energy Research

China benefits from access to Russian pipeline gas, while other Asian consumers shift towards the Middle East and Australia

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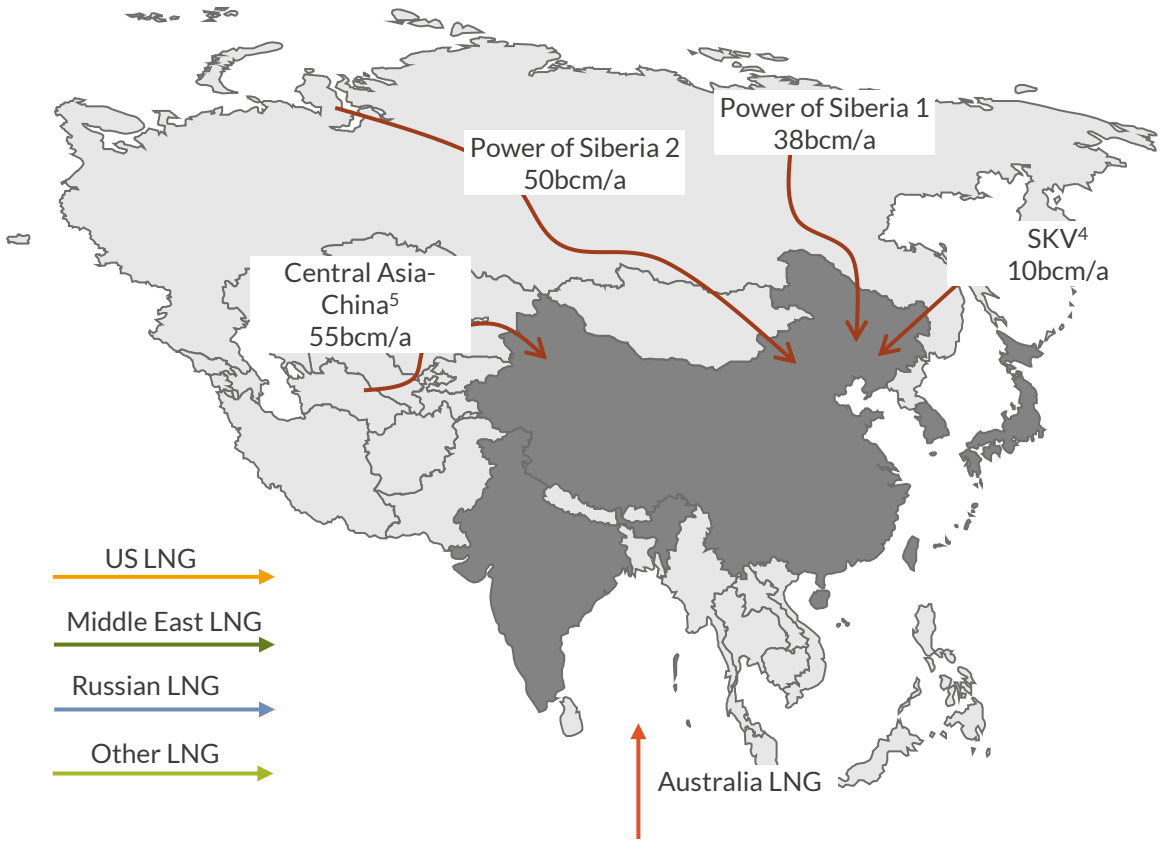
Main gas routes to selected APAC countries[1,2]

bcm

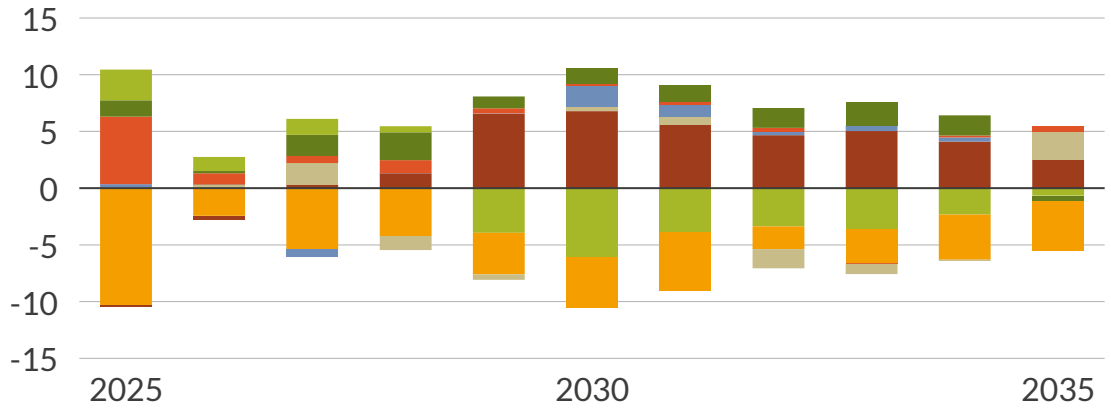


Key changes

- Imports of US LNG fall by 10.3bcm in 2025, replaced by Australian (+6bcm), Canadian (+2.3bcm), and Middle Eastern (+1.4bcm) LNG
- China benefits from higher pipeline supply in 2027-2035, with additional flows of 4.1bcm/a compared to Oct-24 Central
- India, Japan, Korea, and Taiwan increase LNG imports from the Middle East by 1.8bcm/a in 2025-2035

APAC countries gas balance – change vs Central

bcm



Pipeline | Other[3] | Russia LNG | Australia LNG | US LNG | Middle East LNG | Other LNG

1) Selected APAC countries include China, India, Japan, South Korea, and Taiwan 2) Power of Siberia 2 and SKV pipelines are planned, the remaining are operational 3) Includes indigenous production and storage 4) Sakhalin–Khabarovsk–Vladivostok pipeline 5) Planned expansion of 30 bcm/a through Line D

Source: Aurora Energy Research

Key Takeaways

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Europe has significantly reduced its reliance on Russian pipeline gas, which now represents around 14% of total imports compared to nearly 50% just five years ago

Ending Ukraine gas transit would cut ~50% of the remaining Russian pipeline flows into Europe

Redirected LNG from Asia and strong storage withdrawals can absorb the impact in 2025, with North African pipeline supply and additional US LNG underpinning supply stability in future years

Upside for Russian LNG into Europe remains limited due to the impact of sanctions and will likely find a market for its gas in friendly economies like China and India, as well as domestically

Q&A Session

Details and disclaimer

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November 2024

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