

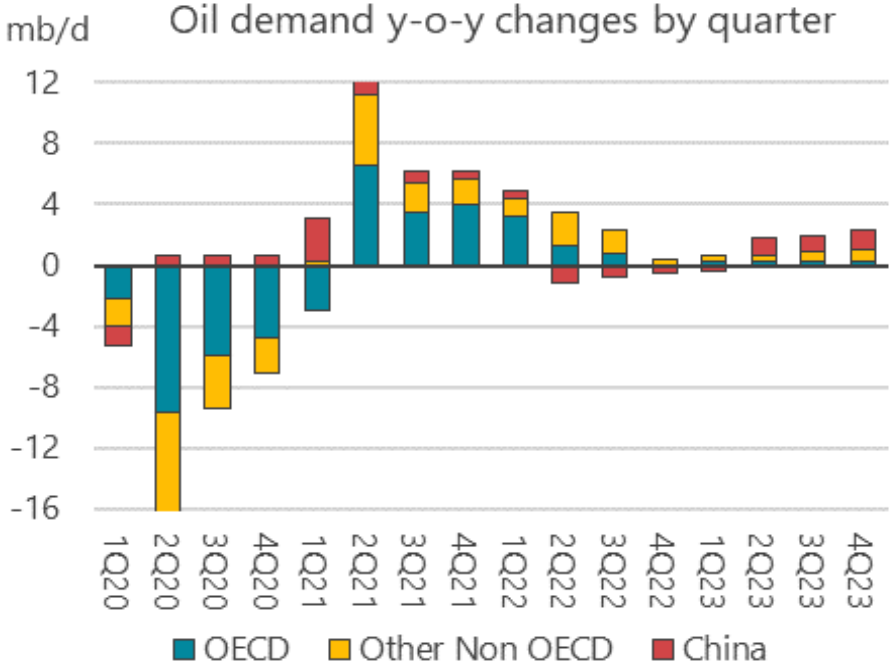
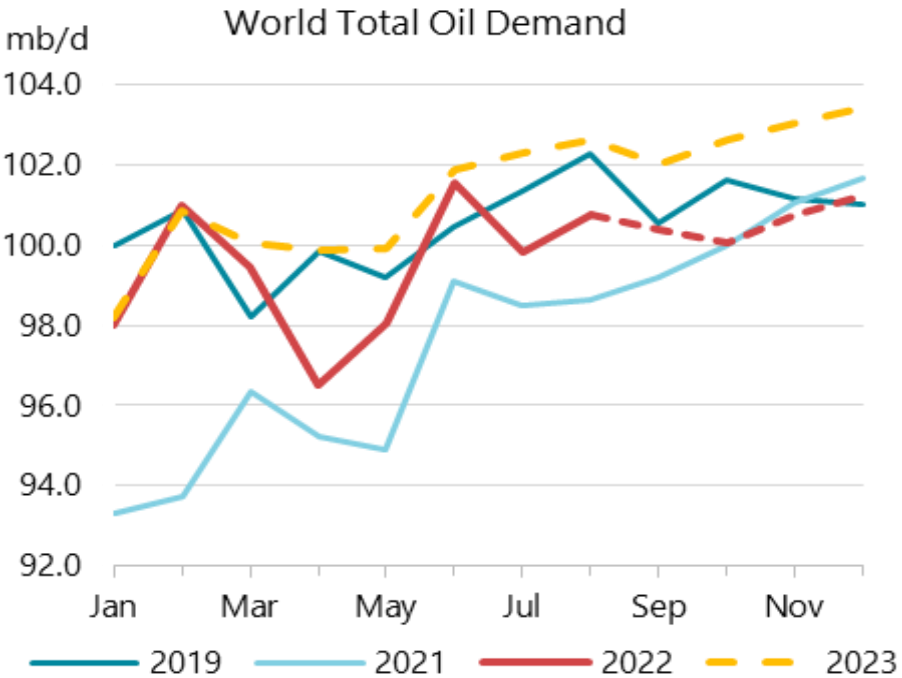


エネルギー市場とセキュリティの現状について

28 November 2022

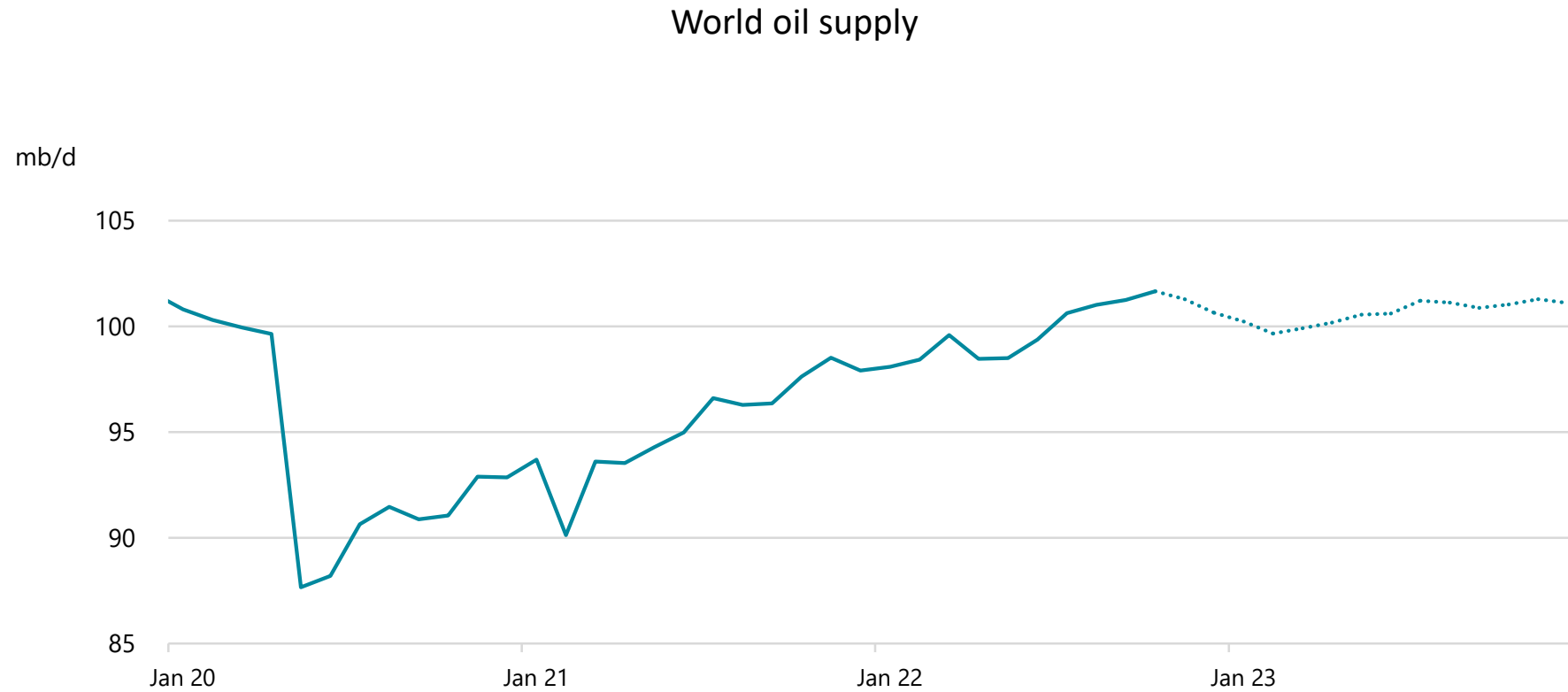
Keisuke Sadamori,
Director for Energy Markets and Security

Demand growth stalls on macro, China headwinds



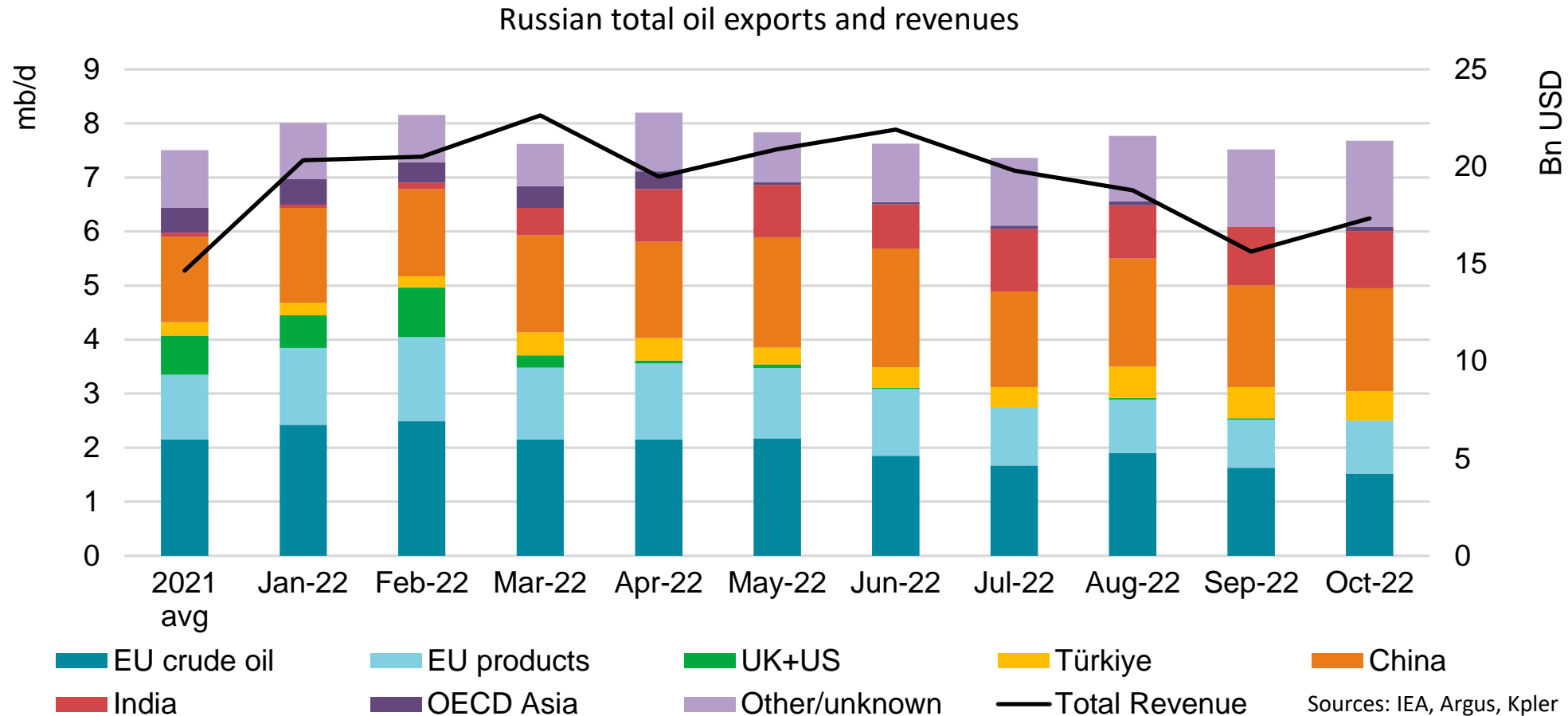
Current forecast for 2022 demand growth 2.1 mb/d y-o-y, vs. 3.1 mb/d pre-invasion. Q4 growth turns negative, to -250 kb/d, both OECD and non-OECD. Growth recovers into 2023 to 1.6 mb/d y-o-y, as China re-opens.

6-month supply uptrend reverses as OPEC+ turns down taps



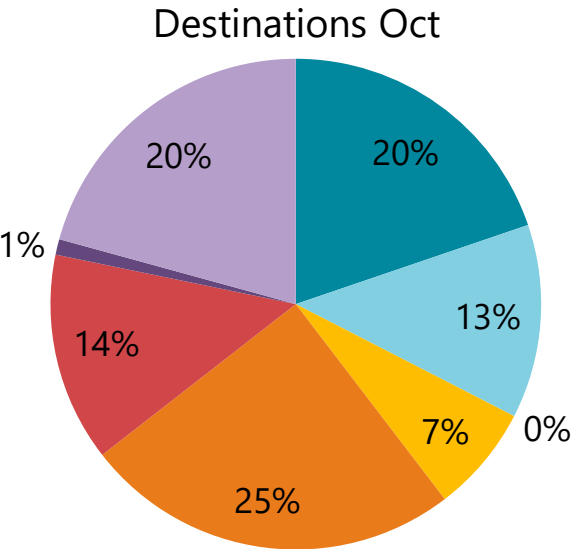
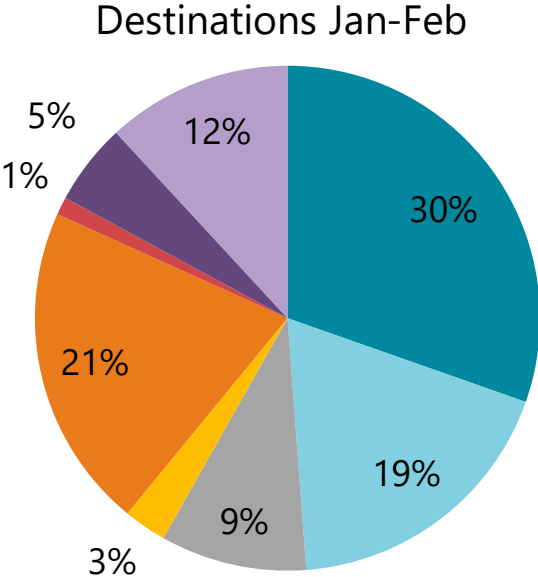
From May-Oct, world oil supply rose by 3.2 mb/d as Saudi, US ramp up and surpass pre-pandemic rates. From Oct-Dec, supply to drop 1 mb/d as OPEC+ implements cuts and EU bans Russian crude.

Calm before the storm: Russian exports inched up in October



Russian oil exports in October were up 160 kb/d m-o-m to 7.7 mb/d, down 400 kb/d from pre-war levels.

EU still accounts for a third of Russian oil exports



- EU crude oil
- EU products
- UK+US
- Türkiye
- China
- India
- OECD Asia
- Other/unknown

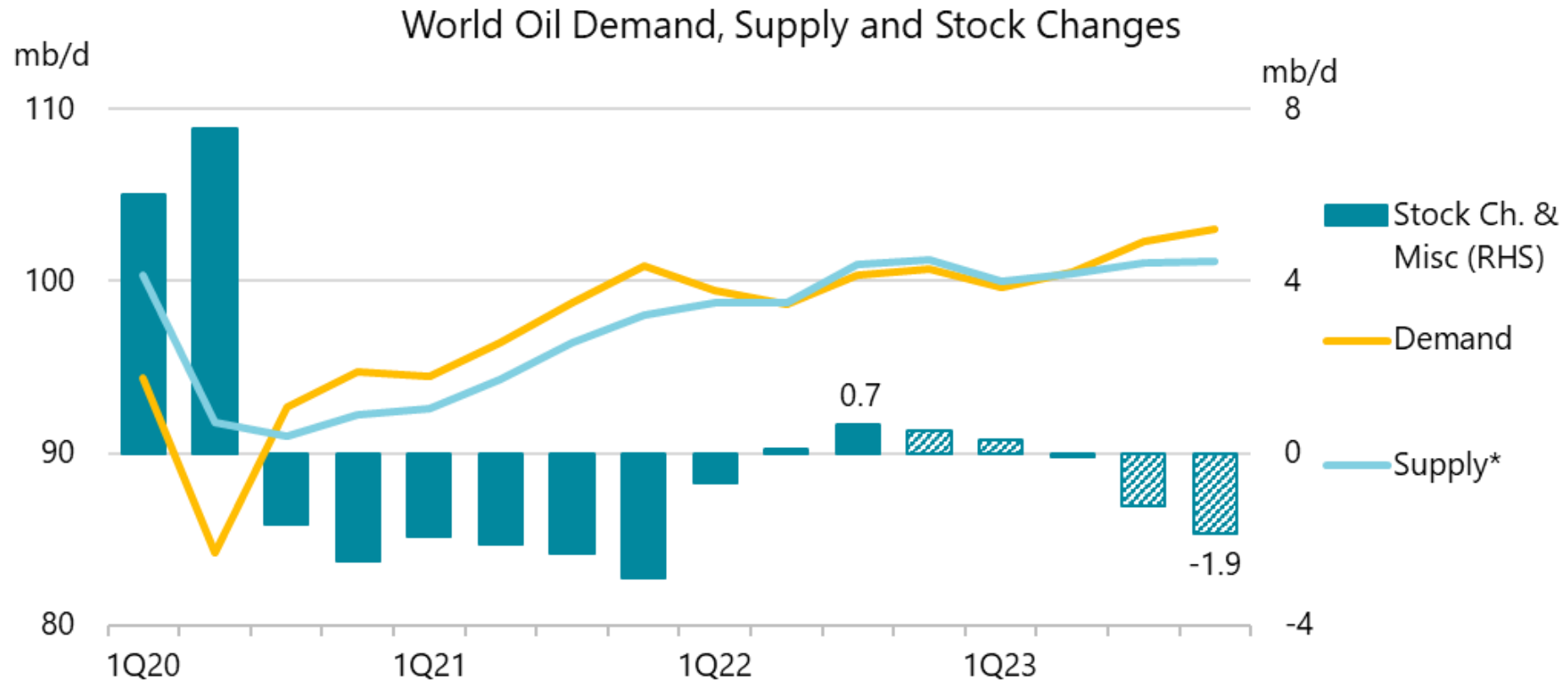
Sources: IEA, Argus, Kpler

- EU crude oil
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Sources: IEA, Argus, Kpler

EU's share is down from 50% to 33% in Russia's total exports.
 5 December deadline shuts off 15% of current volumes, and 5 February – another 13%.

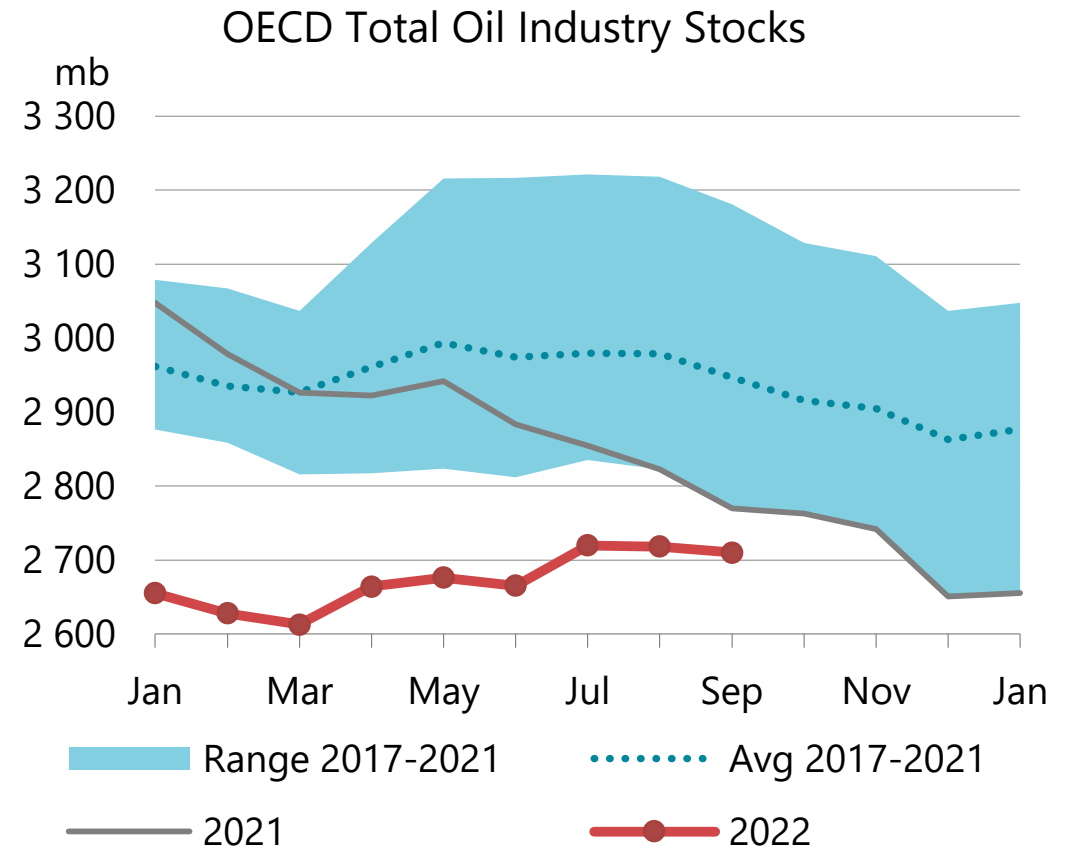
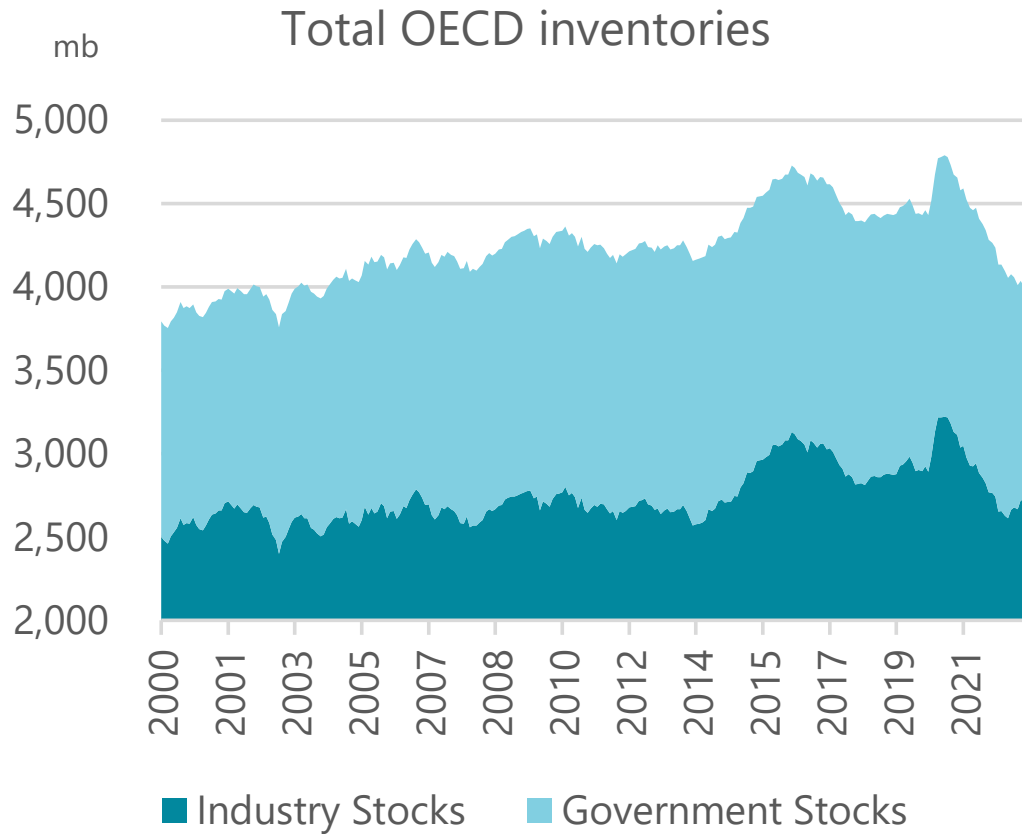
OPEC+ cut, Russian losses curb much-needed build in oil stocks



* Assumes 100% compliance with OPEC+ deal

Reallocation of trade and supply chain disruptions will require bigger buffers. Critically low oil inventories increase energy security risks.

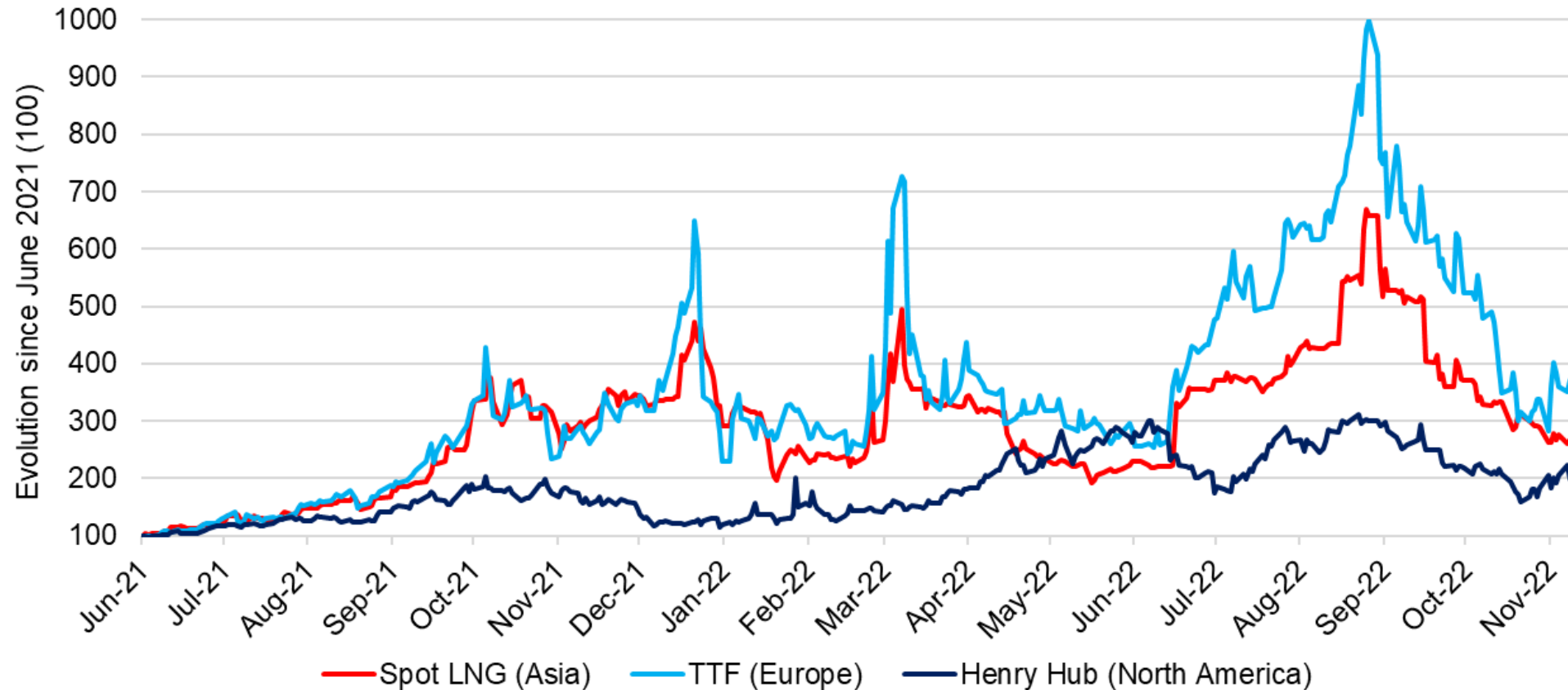
OECD inventories fell below 4 billion barrels



OECD industry inventories fell by 8 mb in September and remained a steep 236.8 mb below the five-year average, at 2 710 mb. IEA member countries released a further 37.4 mb of emergency reserves.

Gas prices dropped from their peak in August but still show strong volatility

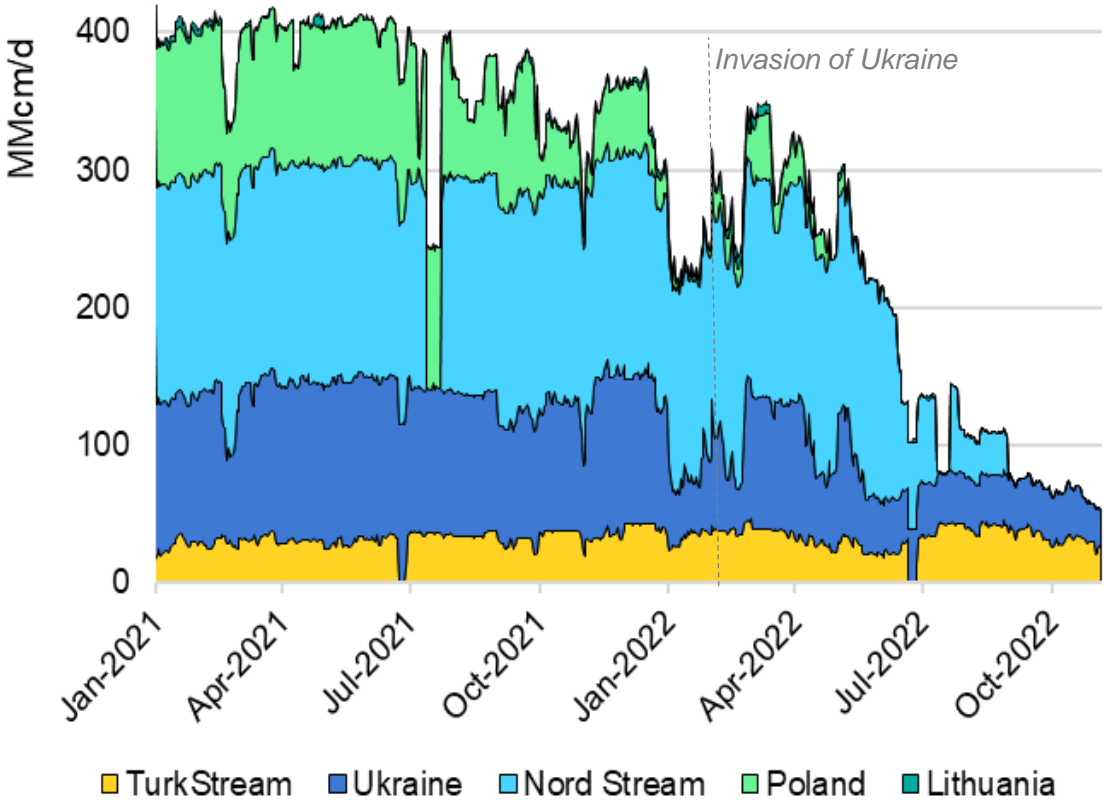
Evolution of key regional natural gas prices since mid-2021



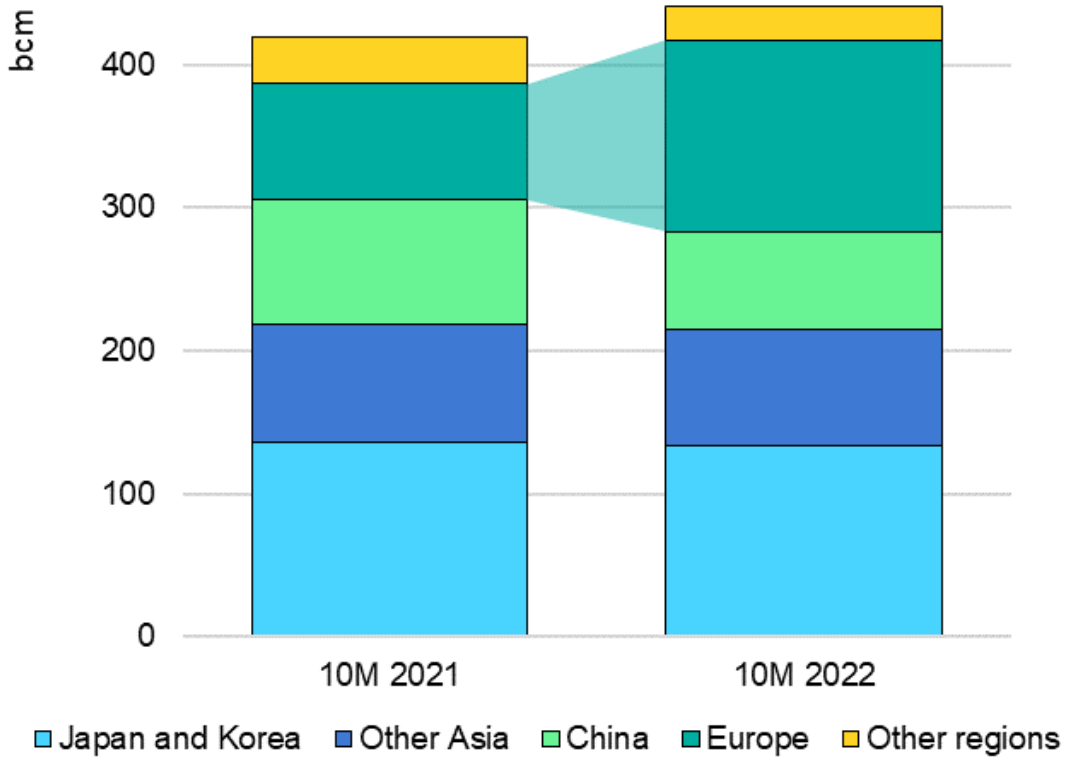
Prices in Europe and Asia declined from their all-time records of late August on a combination of mild temperatures and high storage inventories.

Europe turns into a premium market for LNG as Russian flows tumble

Russian gas pipeline flows to the EU and Türkiye, 2021-2022

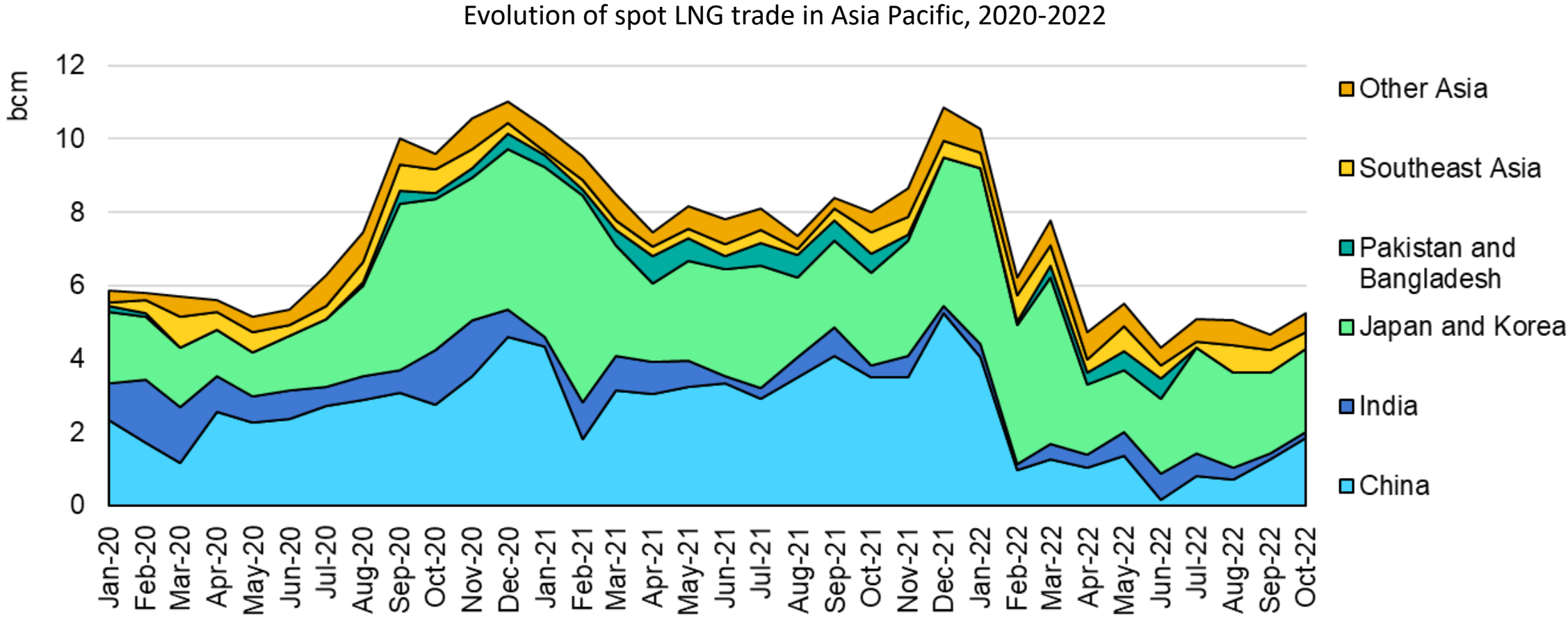


LNG demand per main market (Jan-Oct), 2021-2022



Russian pipeline flows to the European Union halved in the first ten months of 2022, triggering a 65% increase in net LNG imports and a wholesale realignment of LNG trade flows around the world.

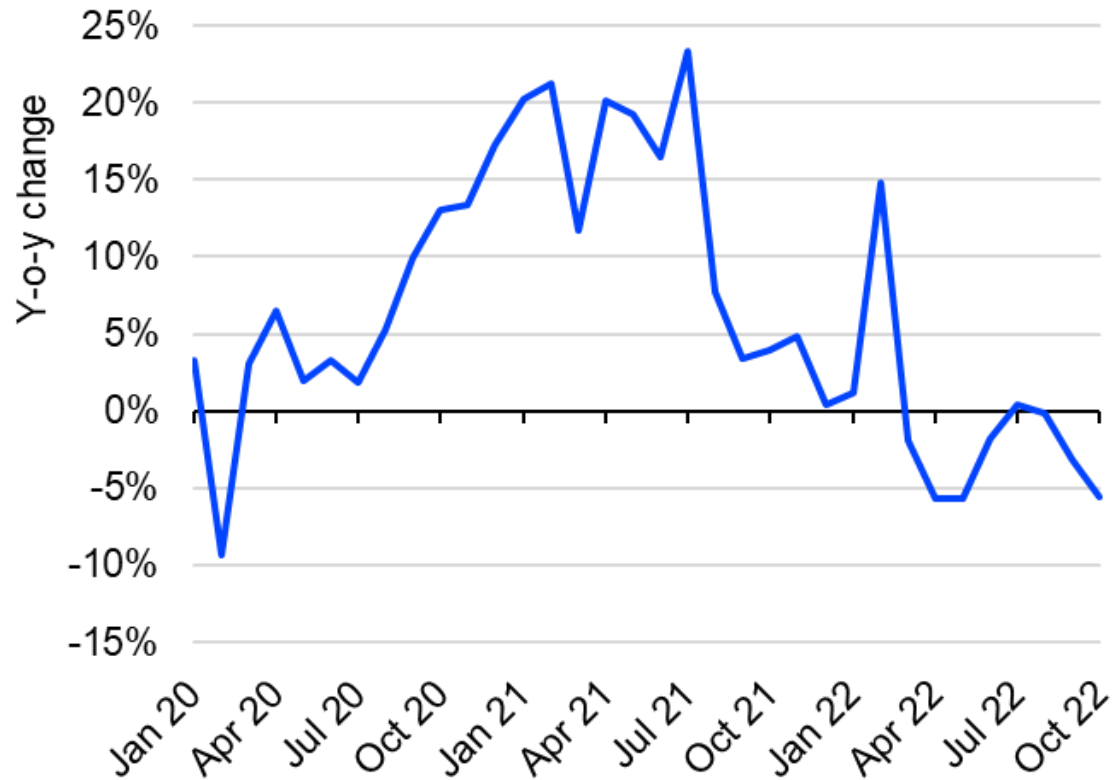
Global LNG market tightness induces shifting trade patterns in Asia



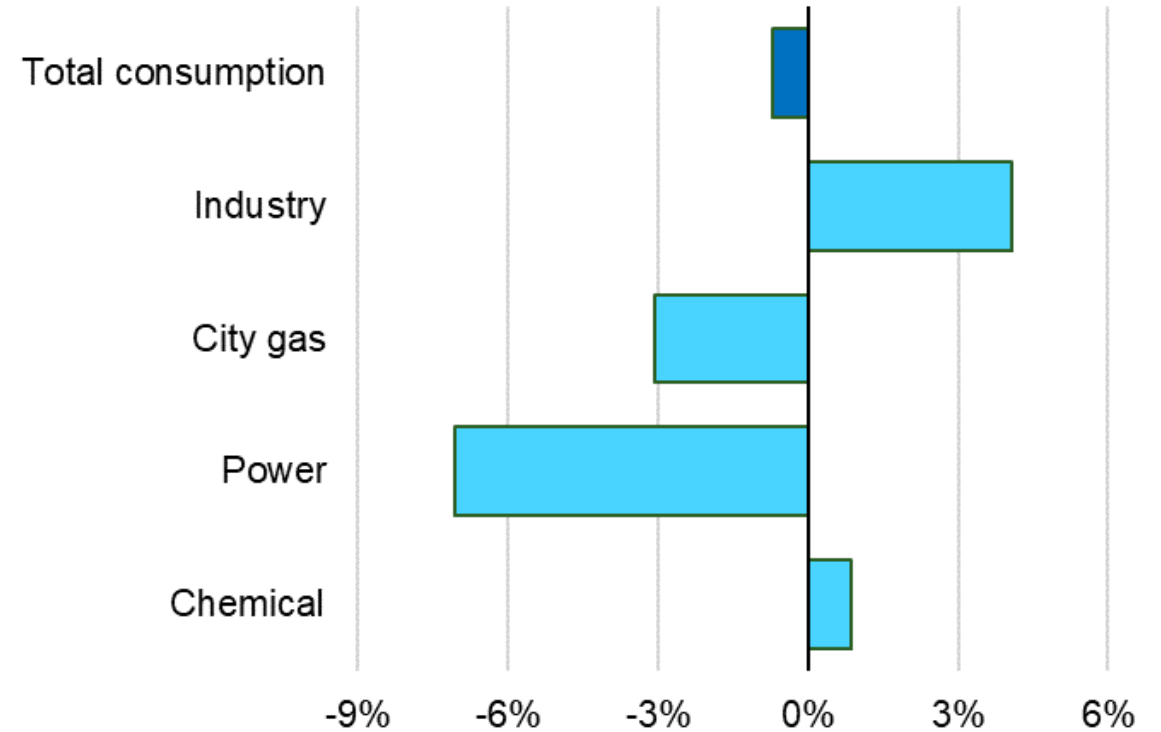
Asian spot LNG imports collapsed since the beginning of the year and about 40% of short-term tenders were left unawarded.

Weak Chinese demand provided relief for the European market

Monthly gas demand y-o-y growth estimates
China, 2020-2022



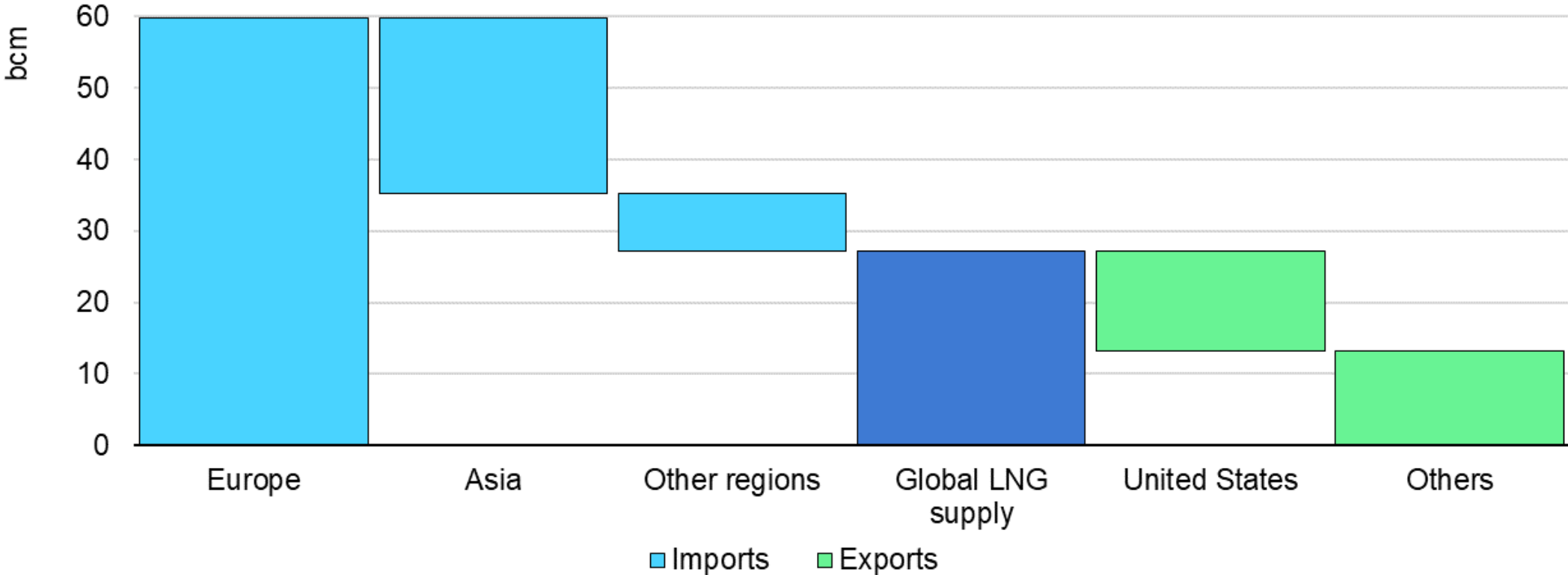
Gas consumption estimate in China
y-o-y growth, 10M 2022



China's gas demand is to experience its lowest annual growth rate since the early 1990s.

Europe's incremental supply needs drive LNG growth and tightness

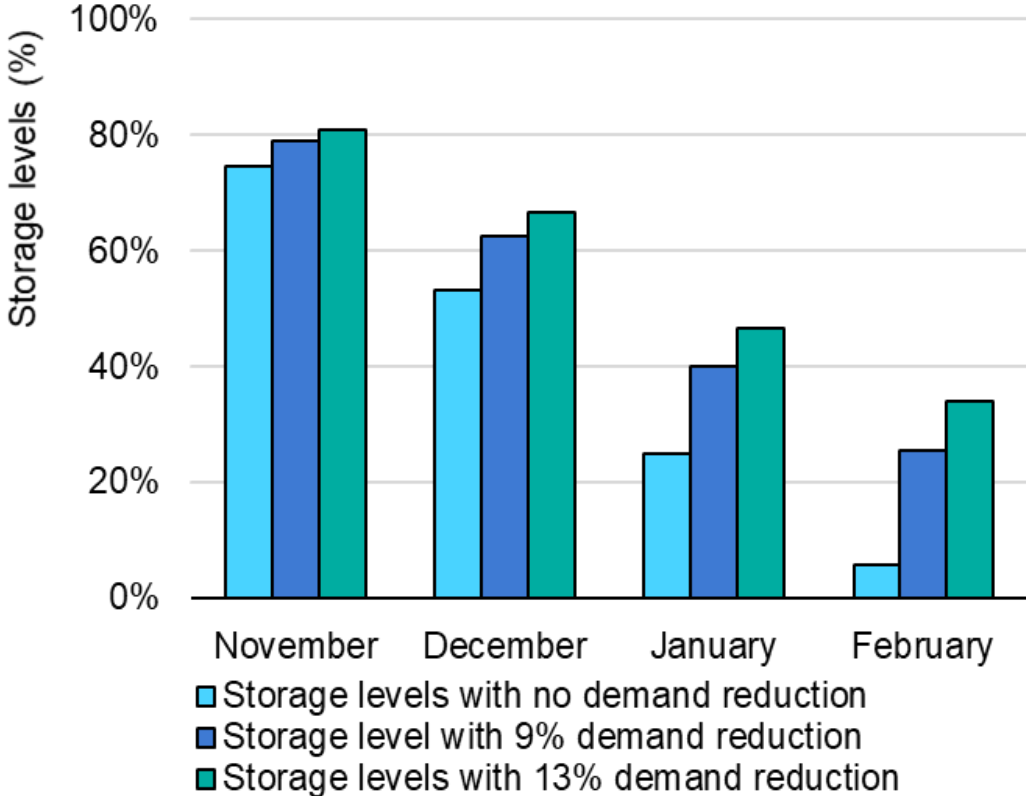
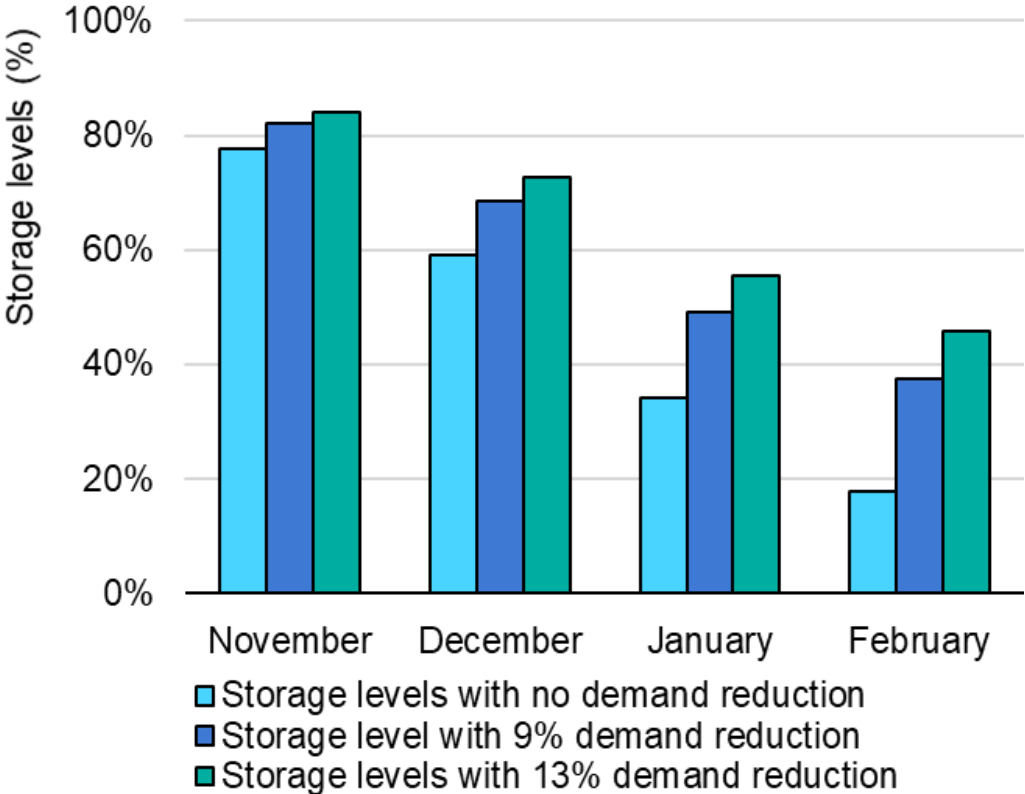
Global LNG balance, y-o-y change, 2021-2022



Global LNG trade flows reconfigure as Europe's incremental LNG needs are expected to account for over twice the amount of supply capacity additions in 2022.

EU resilience analysis in case of a complete Russian pipeline cut from 1 Nov

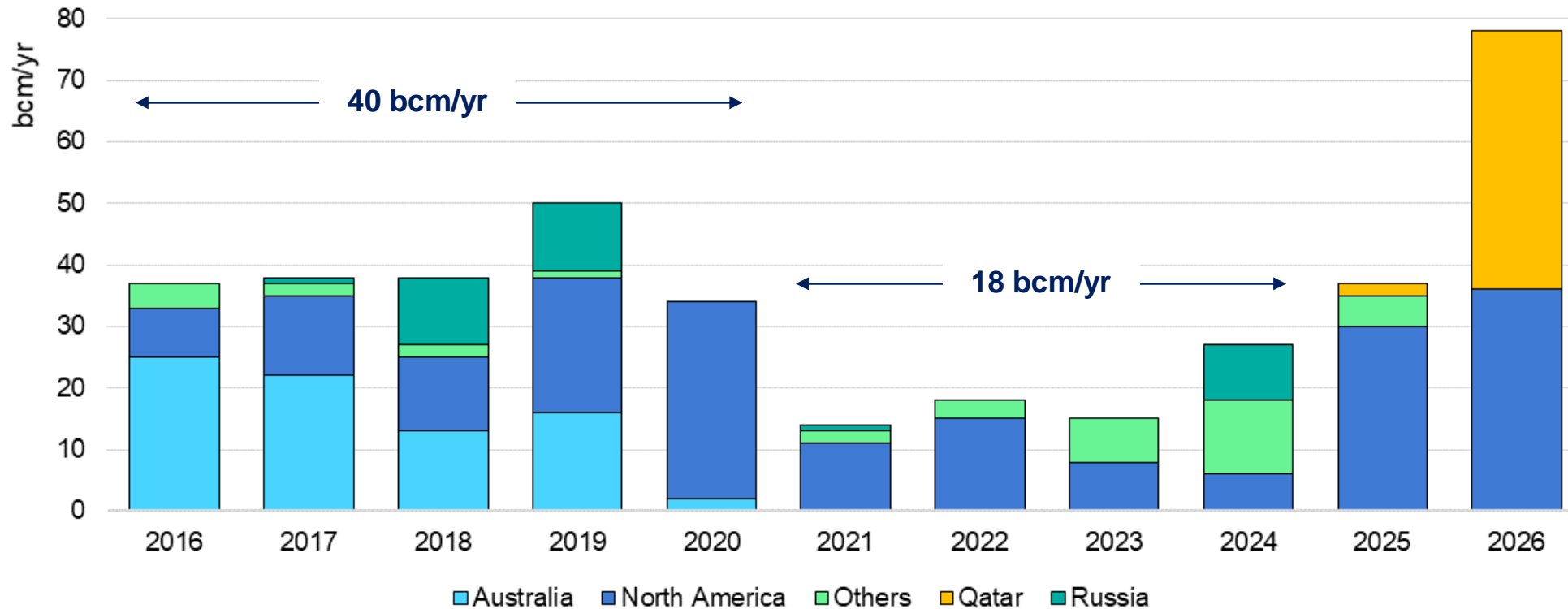
Potential evolution of gas storage levels in the European Union in the event of a complete cut-off in Russian gas supply
 High LNG supply assumption Low LNG supply assumption



Gas saving measures will be crucial to minimise the call on storage in the event of a complete Russian pipeline supply cut this winter and to maintain supply flexibility against potential late cold spells.

LNG capacity additions provide limited medium-term support

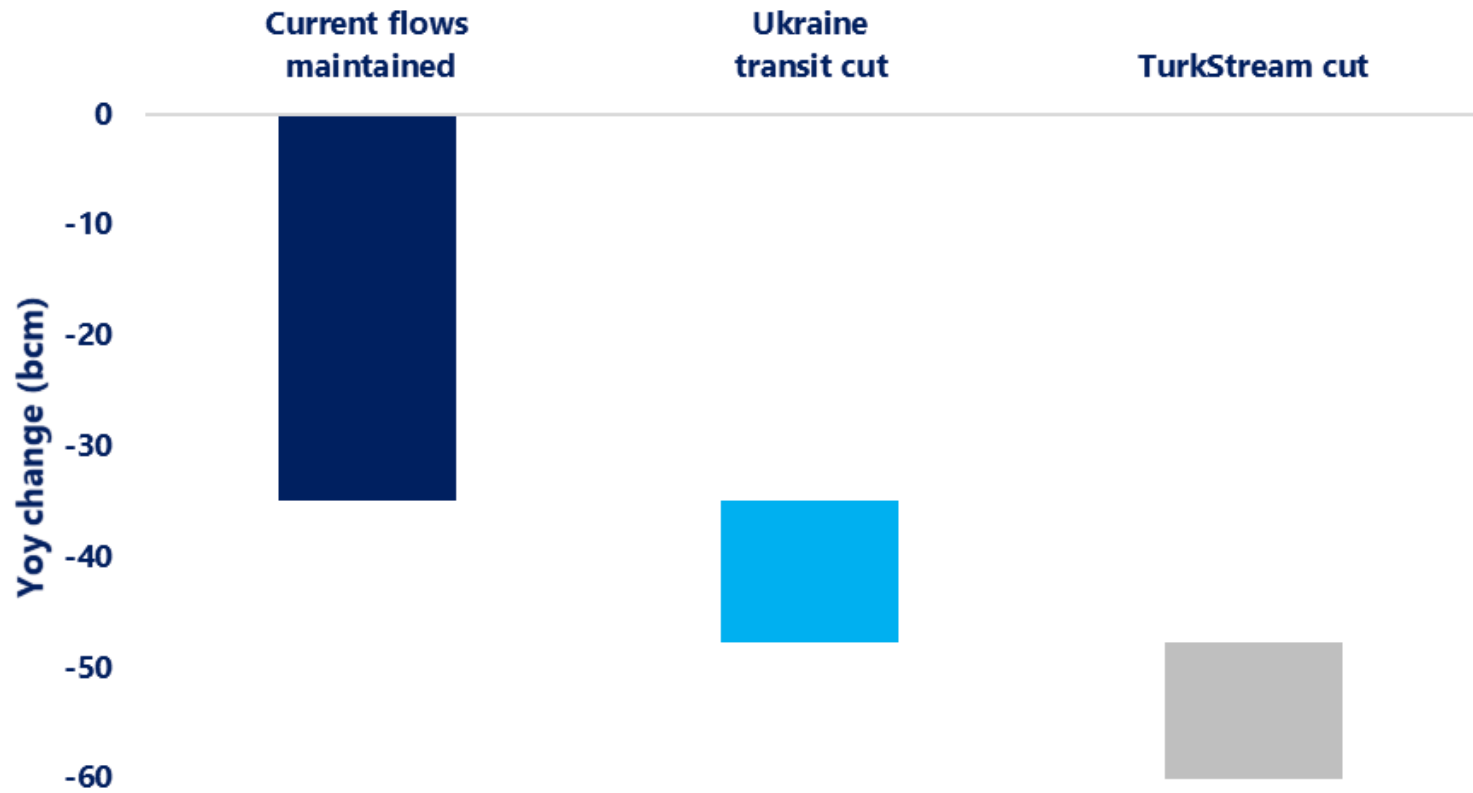
LNG liquefaction capacity additions by regions, 2016-2026



LNG liquefaction capacity additions slow significantly in 2021 to 2024 compared to previous years, raising the risk of prolonged tight market conditions.

Russian piped gas supplies to the EU could drop by 35-60 bcm in 2023

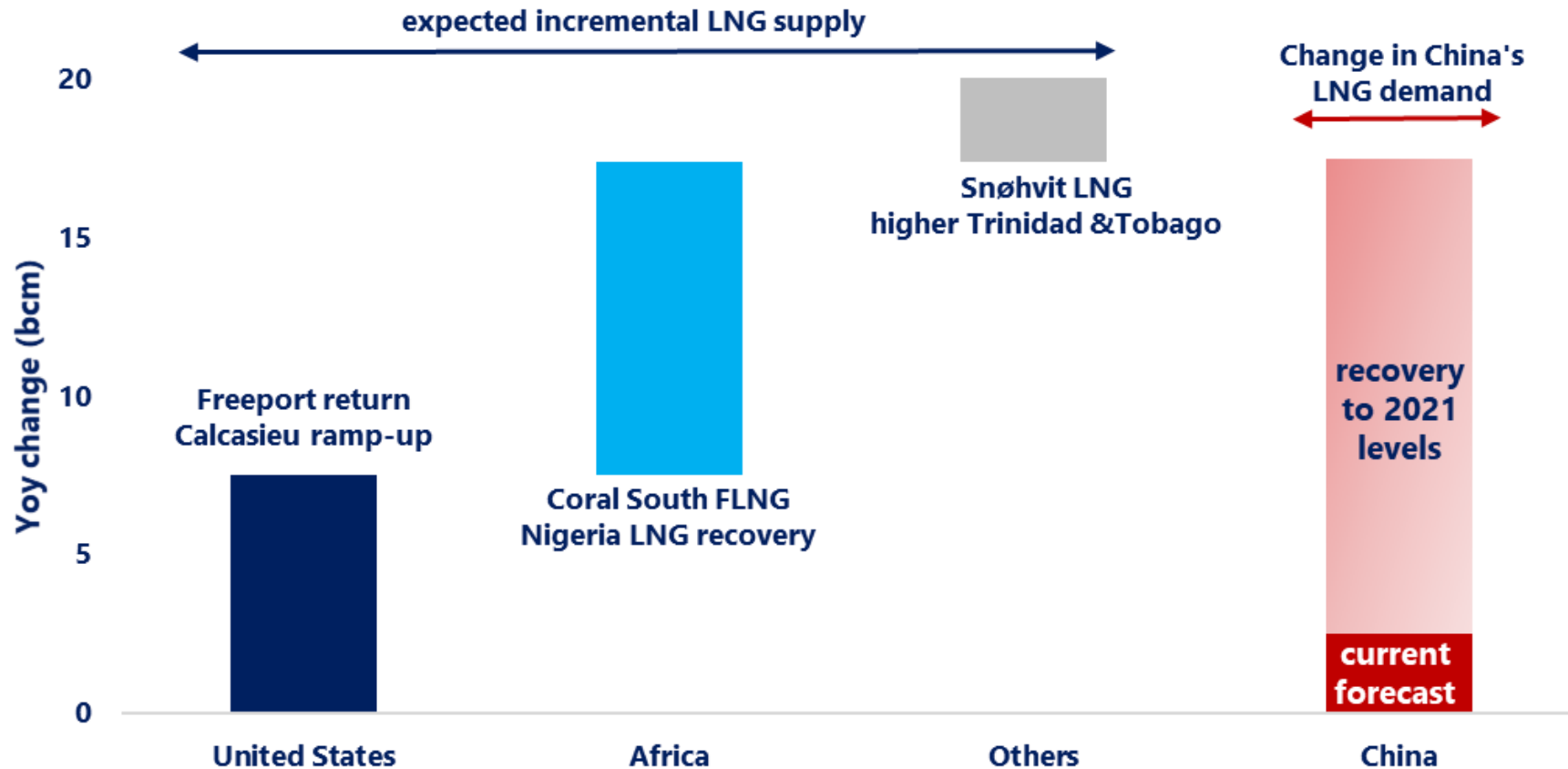
Potential Russian pipeline gas supply reduction from Russia to the EU in 2023 (yoy change)



Russian piped gas supplies to the EU would decline by 35 bcm in 2023, assuming that flows remains at their Sep22 levels. Further supply cuts cannot be excluded and could reduce exports close to 0.

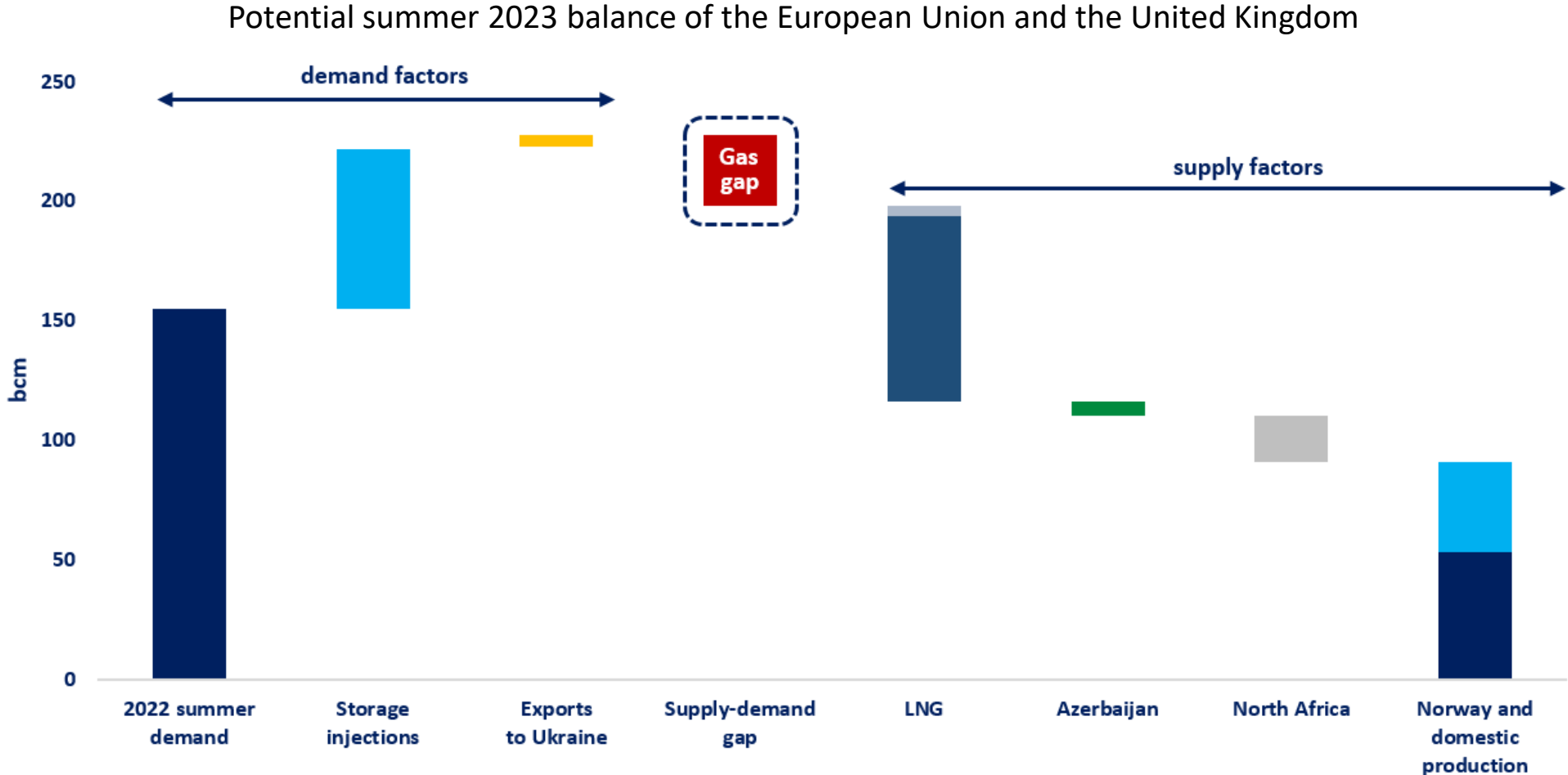
A strong rebound in China's gas demand can change LNG flows

Expected incremental LNG supply in 2022 vs expected LNG demand recovery in China



China's LNG imports recovering to their 2021 levels, would capture over 85% of the additional LNG. This would limit LNG available to the European market in 2023.

Europe could see a supply-demand gap of 30 bcm in summer 2023

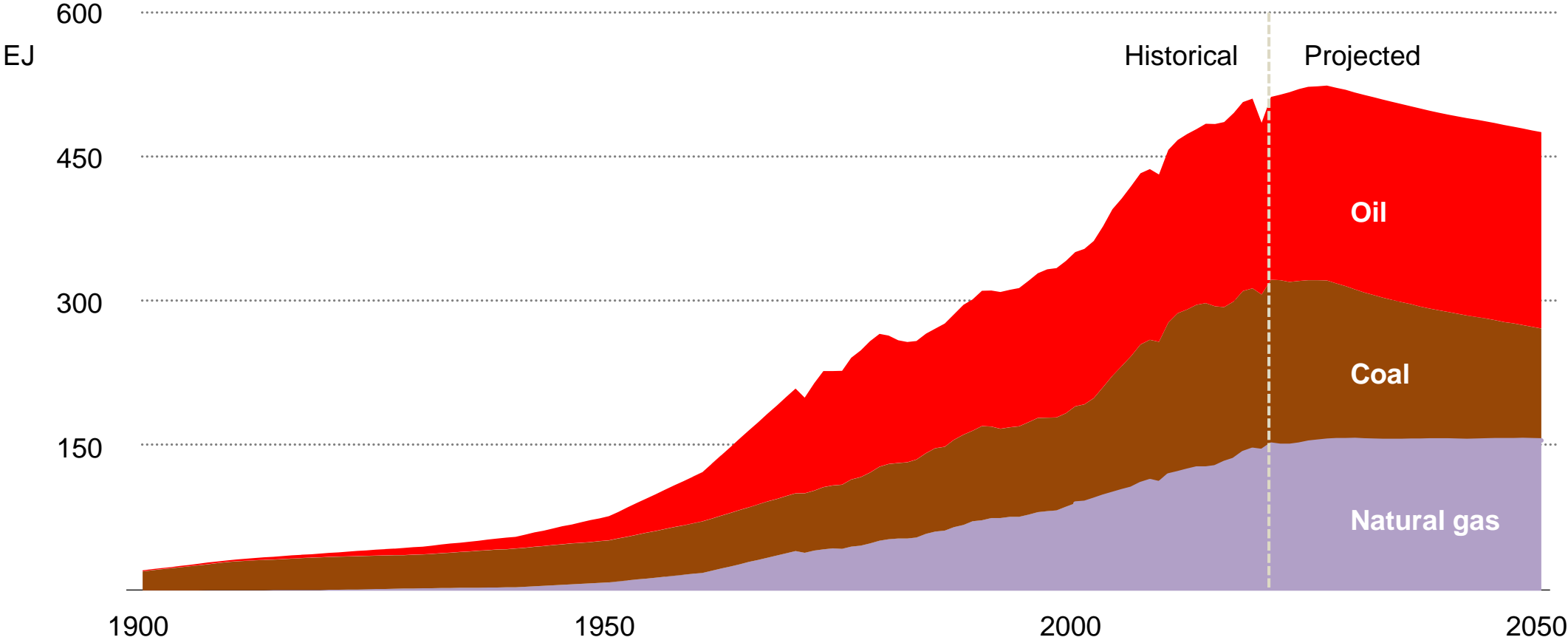


Assuming a full stop of Russian piped gas supplies to the EU, combined with a strong recovery in China's LNG imports and injection needs at 68 bcm, the European gas balance could be 30 bcm short.

Peak fossil fuel demand is coming this decade



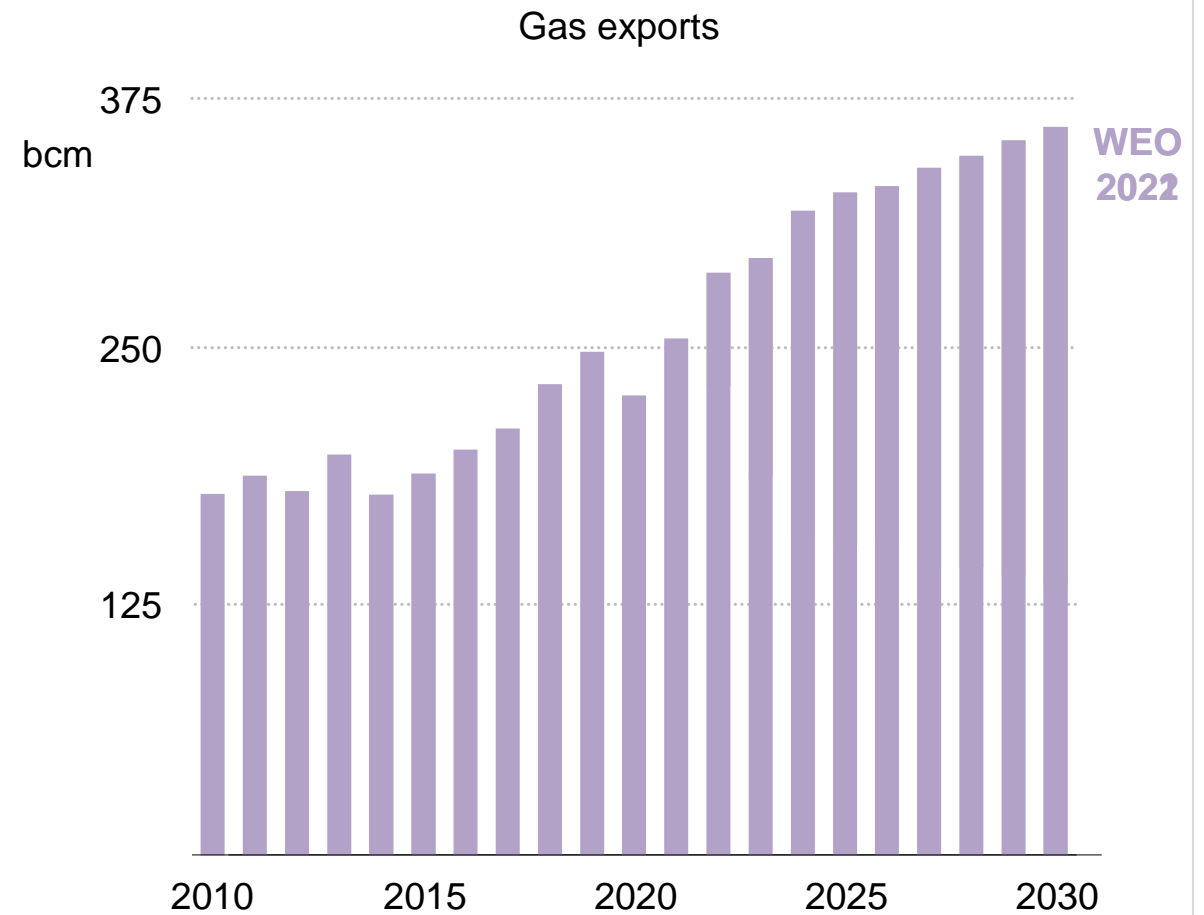
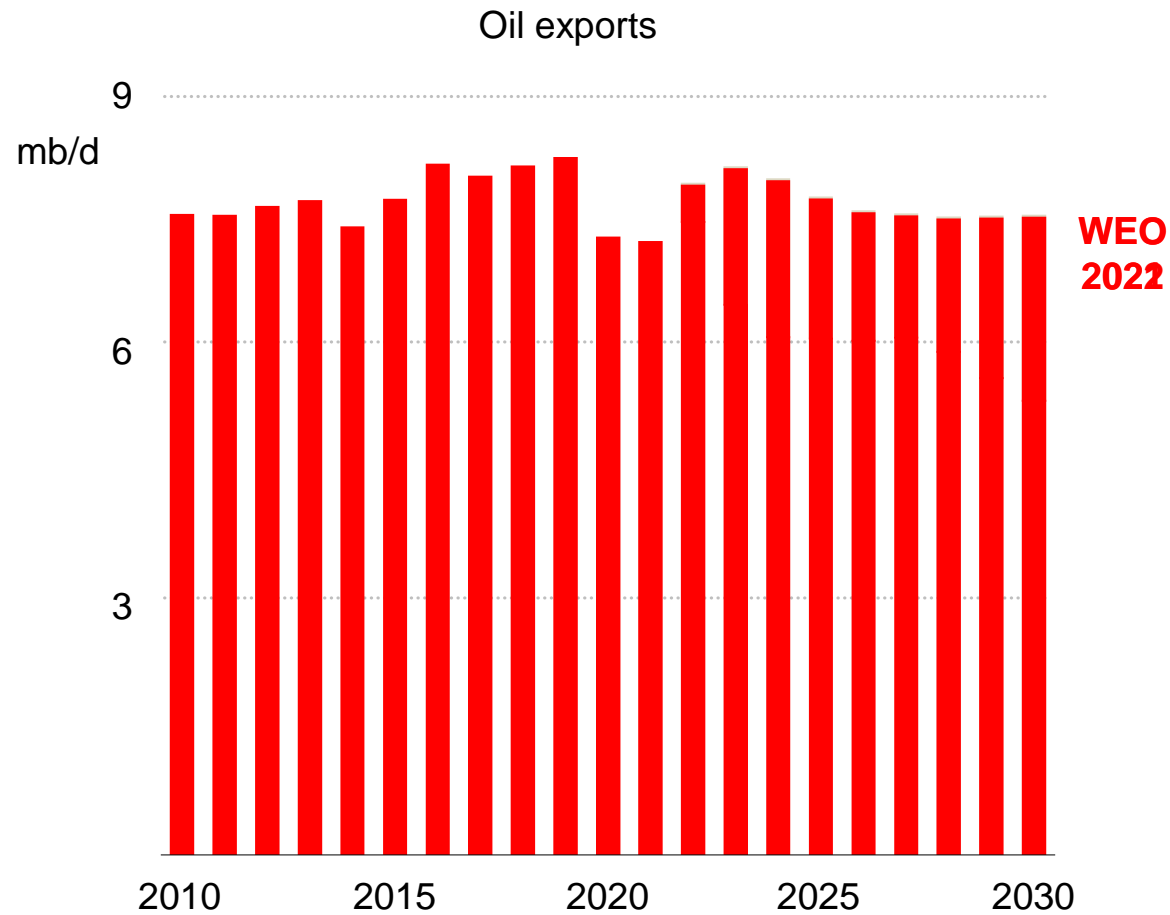
Fossil fuel demand in the Stated Policies Scenario, 1900-2050



Today's policy settings are now sufficiently strong that they produce a distinct peak in fossil fuel use before 2030

Russia faces a much-diminished role in international energy

Russian oil and gas exports in the Stated Policies Scenario

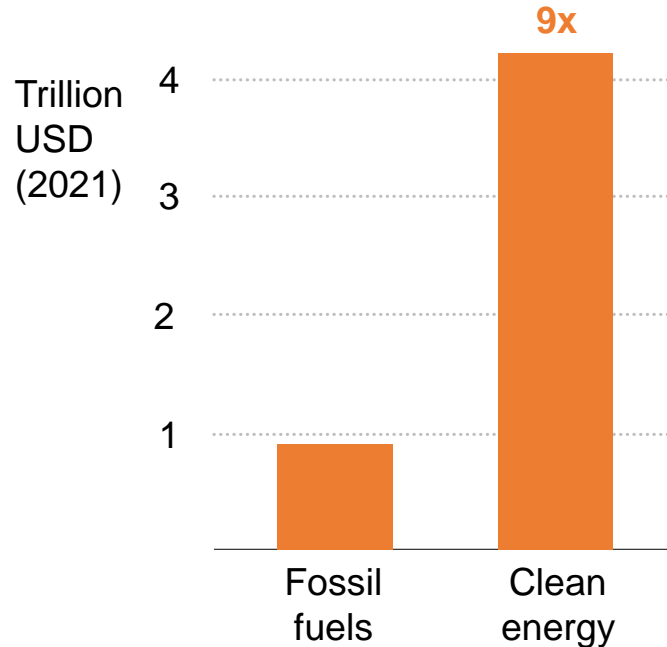


Russia's share of global oil and gas trade halves by 2030, with exports from the United States, Middle East, South America and East Africa – and enhanced efforts to reduce demand – filling the gap

A new energy security paradigm is needed for secure transitions

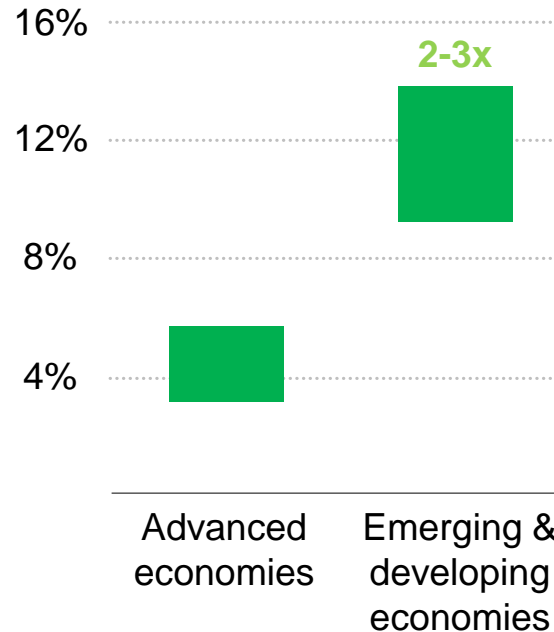
Scale up clean energy
to scale back fossil fuels

Investment in NZE Scenario, 2030



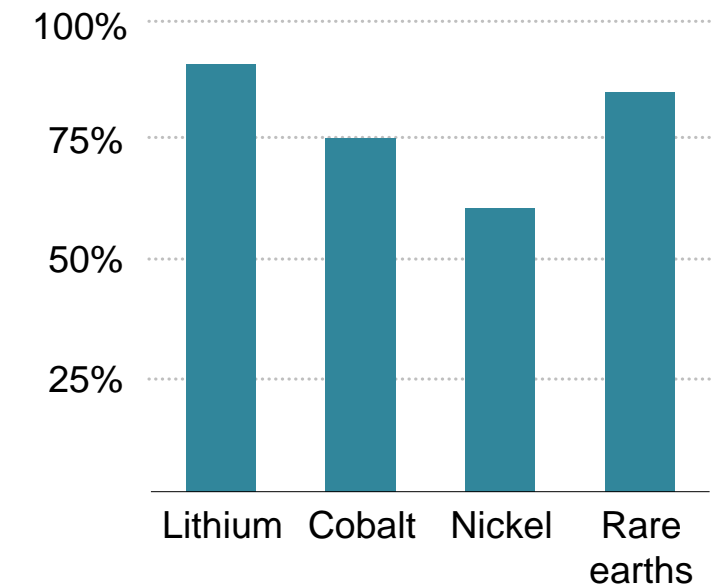
Lift emerging economies into the
new energy economy

Cost of capital for solar PV, 2021



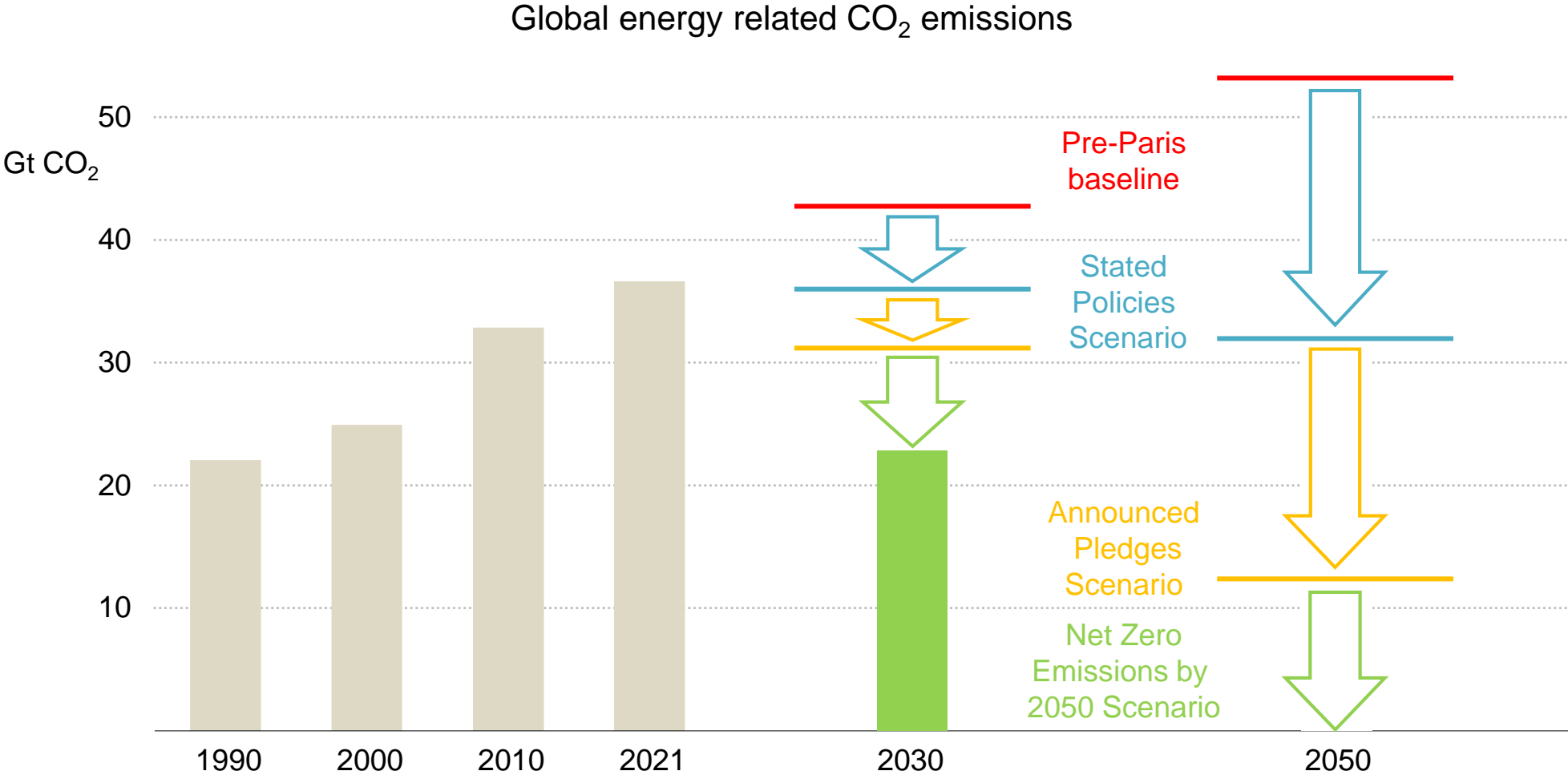
Manage new vulnerabilities

Share of top 3 countries in mineral production



For the duration of energy transitions, the clean energy and fossil fuel systems are *both* required to deliver energy services; assessing & managing the evolving co-existence of both systems is crucial

Keeping the door to 1.5 °C open



Policy and technology progress since 2015 has shaved 1 °C off projected warming, a step in the right direction; but much more needs to be done in order to avoid severe climate disruptions

- Government responses to today's energy crisis are marking this out as a major turning point towards a cleaner and more secure energy system
 - Russia's invasion of Ukraine is prompting a wholesale reorientation of energy trade & investment flows, leaving Russia with a much-diminished position in global energy
 - Global fossil fuel use has grown alongside GDP since the Industrial Revolution: putting fossil fuel demand into reverse will be a pivotal moment in energy history
 - A massive surge in clean energy investment is vital to keep the door to 1.5 °C open; without this, avoiding renewed price volatility would require higher oil & gas investment, putting climate goals in jeopardy
 - Today's energy crisis provides a stark reminder of why we have to press ahead with energy transitions, & the importance of making change inclusive, affordable & secure
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