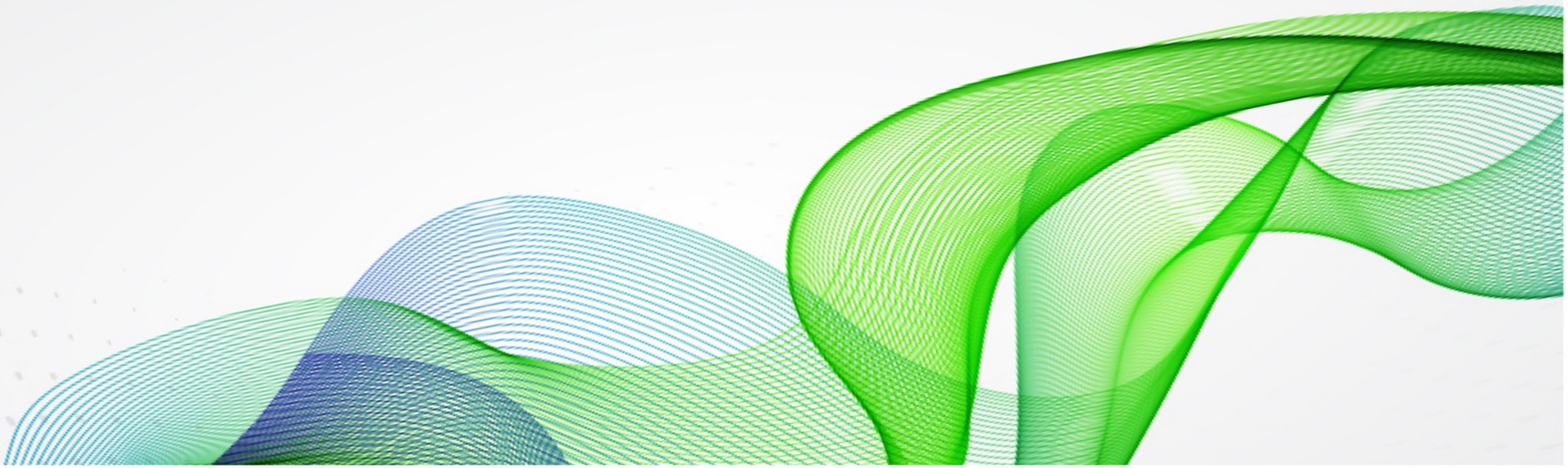
THE OXFORD INSTITUTE FOR ENERGY STUDIES

The Russia-Ukraine War and Implications for Energy Markets



BASSAM FATTOUH, NOVEMBER 2022

Key implications

- Russian invasion of Ukraine represents a paradigm shift for global/European energy markets and energy relations

- Widespread belief that no return to previous order and energy markets are searching for a new normal but transition to ‘new normal’ can be long and bumpy

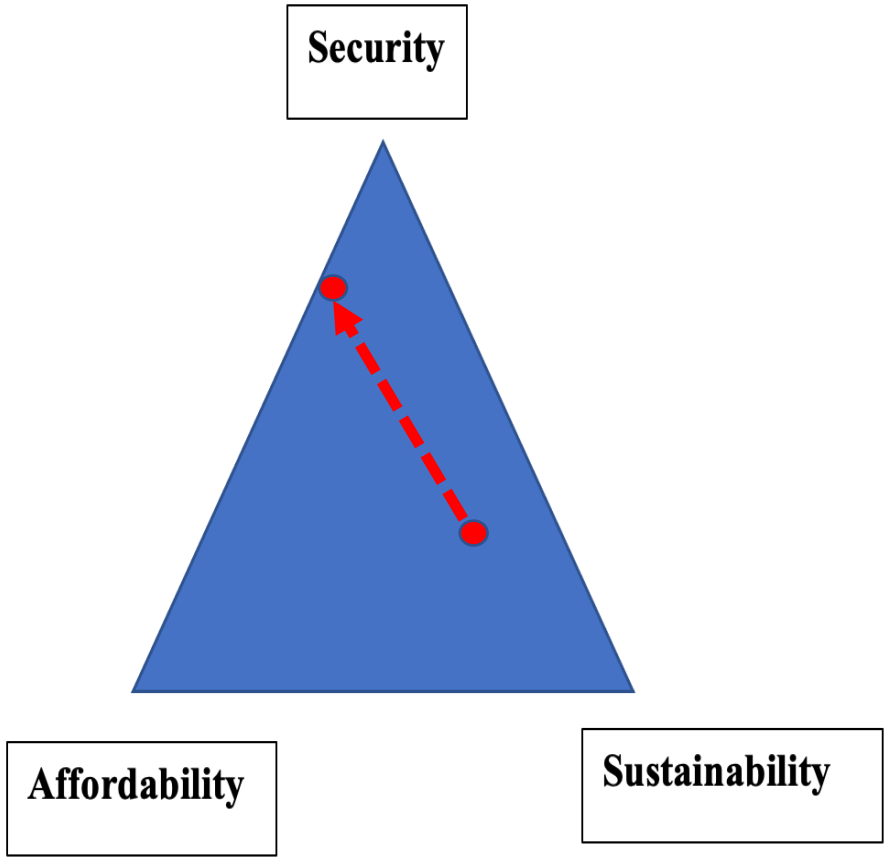
- Four profound implications
  - Energy policy and the trilemma
  - The role of the state versus the market in energy
  - Transformation in oil and gas trade flows
  - Global cooperation on the climate agenda

Energy policy and the Energy Trilemma

Energy trilemma in focus

- Energy policy multifaceted (sustainability, security, affordability, development, economic competitiveness)
- Benign environment lowered importance of energy security and affordability but Russia-Ukraine war changed this
- Security & affordability key factors currently shaping policy
- Creating trade-offs and unintended consequences in short-term
  - Inter-fuel substitutions increasing emissions
  - Support measures diluting impact of the price signals
- Interconnectedness of energy markets has global implications
  - Making energy more expensive in many developing countries affecting affordability and transition paths
- Transition will not proceed linearly; subject to setbacks but could also trigger an accelerated transition in Europe

The Energy Trilemma - Balance of policy priority has shifted, at least in the short term



Source:OIES

The Role of the State versus the Market

Government interventions

- Governments taking measures to offset impact of shocks on consumers/ industry
  - Support packages to protect consumers dampening the impact of price signals
  - Windfall taxes/levies to finance support packages
  - Imposing price caps to shield consumers from energy price shocks
  - Calls for redesigning electricity and carbon markets
- Some measures increase policy risk and uncertainty facing investors and could impact investment decisions and pace of transition

Measures Adopted/Considered to Offer Protection

Measures Adopted or Being Considered:	Liquid Fuels	Electricity and Natural Gas
Energy prices: wholesale/retail price ceilings or caps, price freezes, limits on pass-through	Belize, El Salvador, Hungary, Slovenia, Thailand	Bulgaria, Croatia, Portugal, Pakistan, Spain
Energy bills: bill discounts, bill deferrals, installments, moratorium on utility disconnections for non-payment		Italy, Romania, Sweden
Taxes: VAT, fuel, excise, or carbon tax reductions for electricity or fuels, full tax holidays or exemptions, corporate tax deferrals	Australia, Croatia, Cyprus, Germany, Guyana, Poland, Serbia, South Africa, United Kingdom, Vietnam	Belgium, Croatia, North Macedonia
Social protection: cash transfers to households, expanded benefit schemes	Philippines	Denmark, Germany, Italy, Jamaica
Support to sector companies: fiscal transfers to oil and gas companies, utilities (electricity and gas suppliers), interest-free loans, guarantees, relaxed state-aid rules for firms	Bangladesh, Japan, Paraguay	Panama, EU
Support for energy consuming enterprises: fiscal transfers to firms, such as transport operators, farmers, textiles, fertilizer, cement; debt relief, restructuring	Belize, Greece, Jamaica, Morocco, Philippines, South Korea, Spain	France, Romania

Source: World Bank

State versus market: Crises shifting the balance

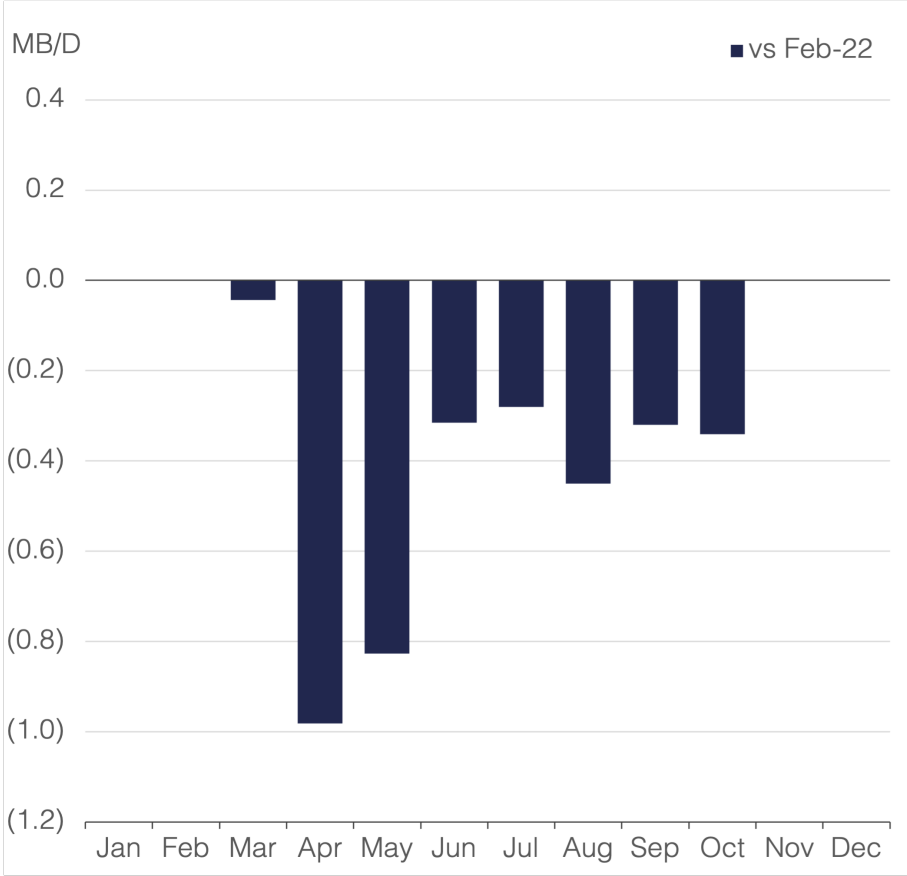
- Market forces are a central part of the energy system
- But government ultimately responsible for guaranteeing that everyone has access to energy; for securing public goods of decarbonisation and security of supply; and demonstrating that markets work for all citizens
- How to balance the role of government versus market in future market designs?
- Current crisis causing swing away from markets towards states. How long will this continue?
- Will a necessary admission that net zero targets are being missed force further government intervention?

Transformations in Oil and Gas Trade Flows

Redirection of oil trade flows

- Russian oil supply disruption limited so far
- Well below initial expectations at start of Russia-Ukraine war (around 400,000 b/d)
- Success in redirecting crude exports away from Europe to other parts of the world (particularly to Asia)
- Through offering discounts and easier payment conditions
- Services and logistics (shipping, insurance) not acting as constraint so far, but this will change as EU embargo comes into force in December

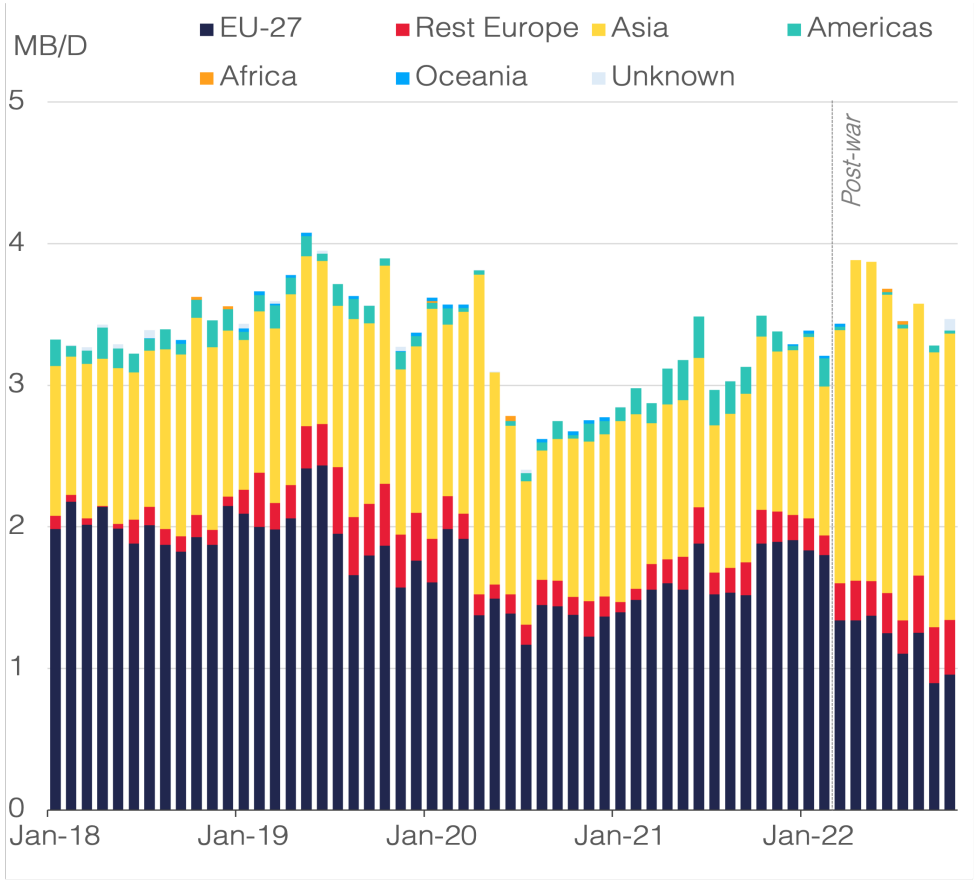
Russian crude supply disruptions



Source: OIES

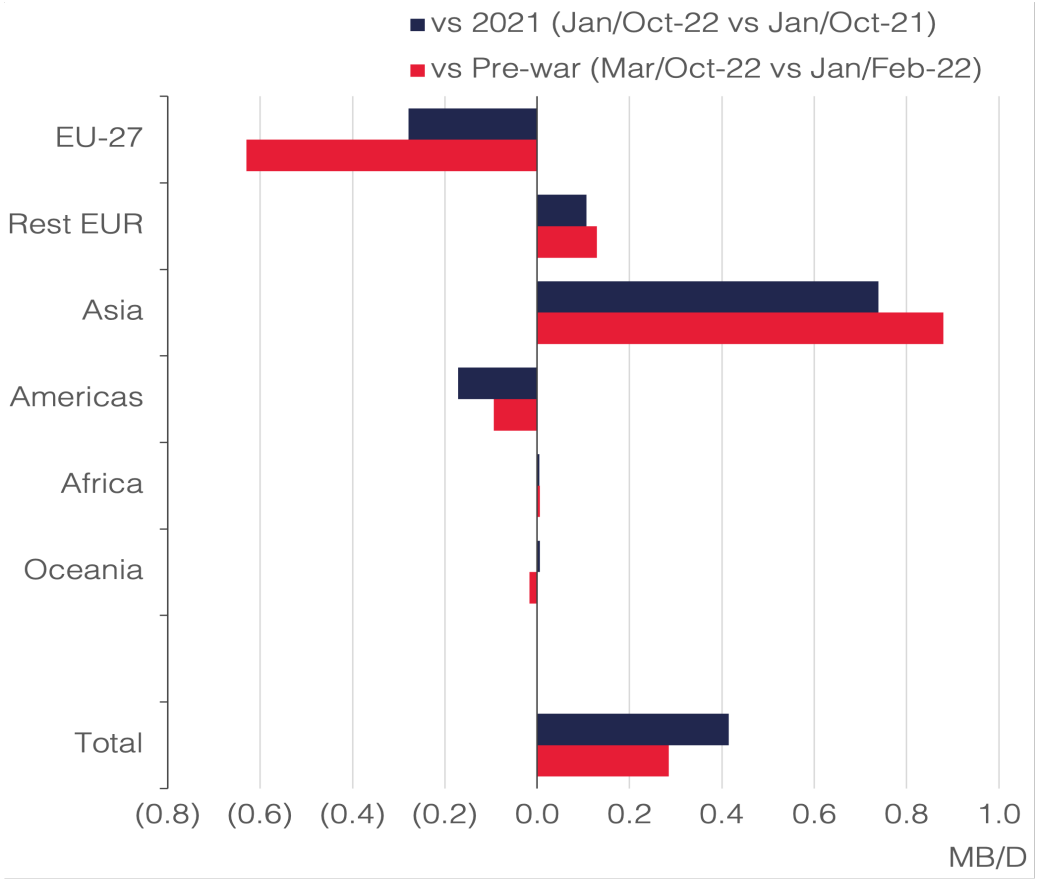
Crude exports are above pre-war levels

Russia crude exports by destination



Source: Kpler, OIES

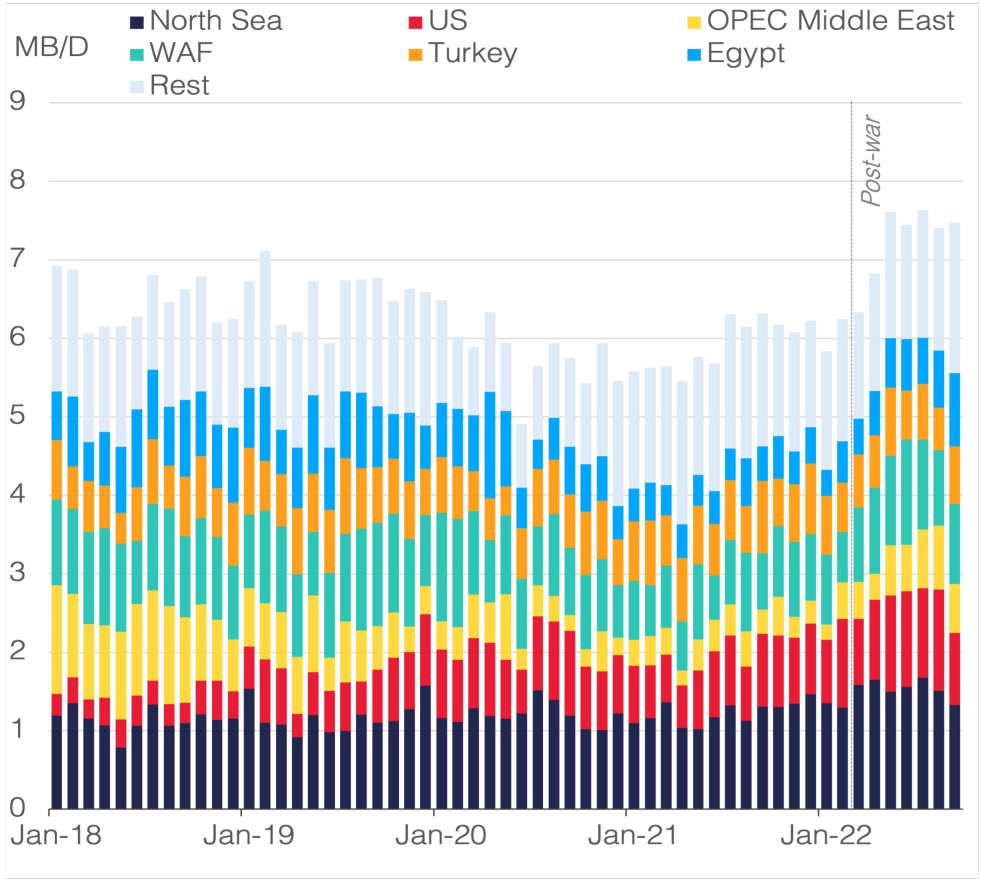
Russia crude oil export shifts



Source: OIES

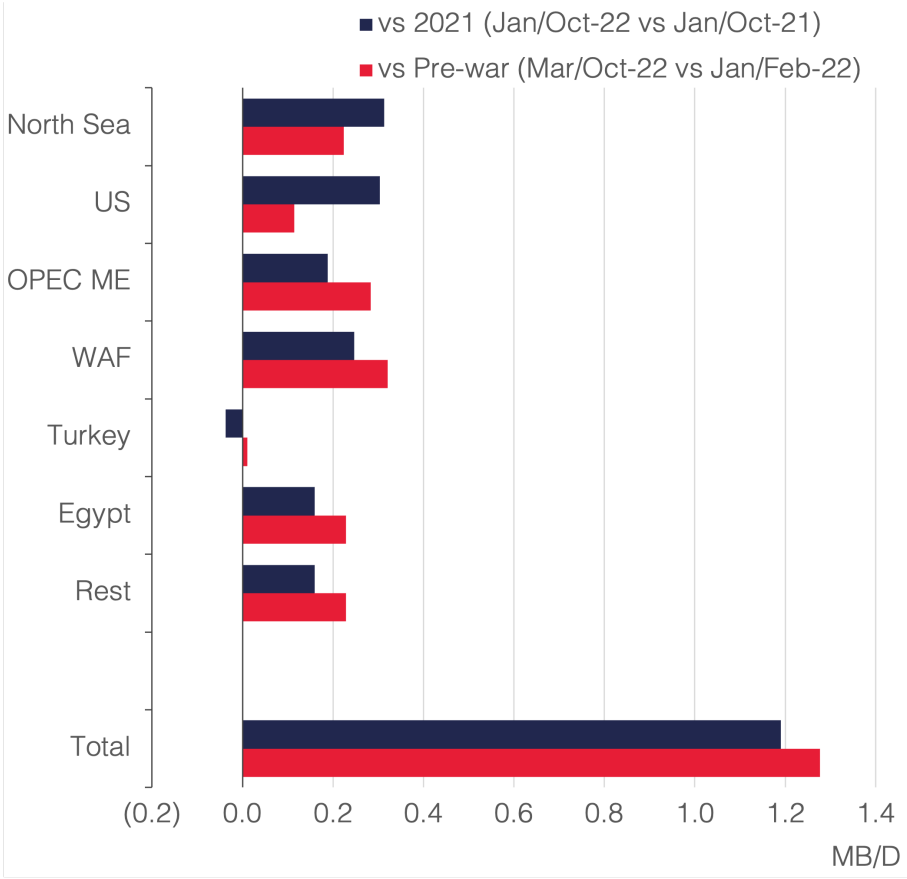
Alternative sources to cover loss of Russian supplies

EU-27 crude oil imports excl. Russia



Source: Kpler, OIES

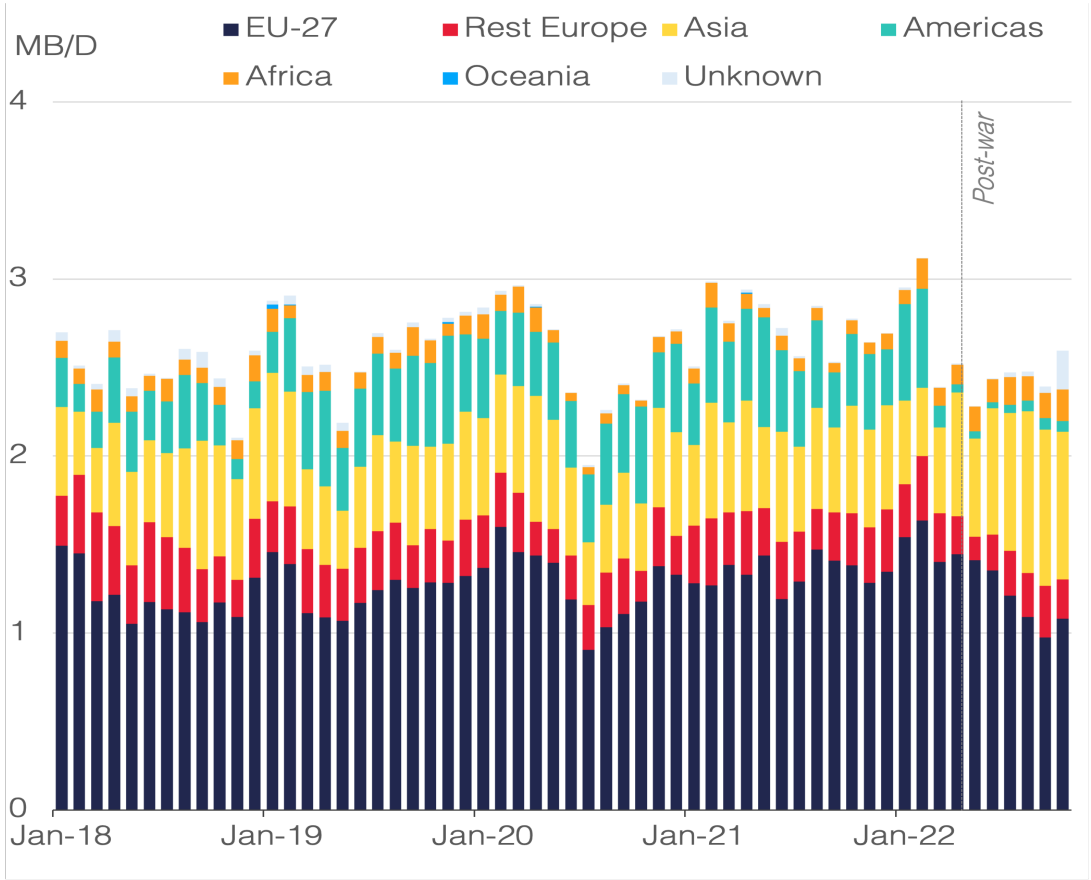
EU-27 crude oil import shifts excl. Russia



Source: OIES

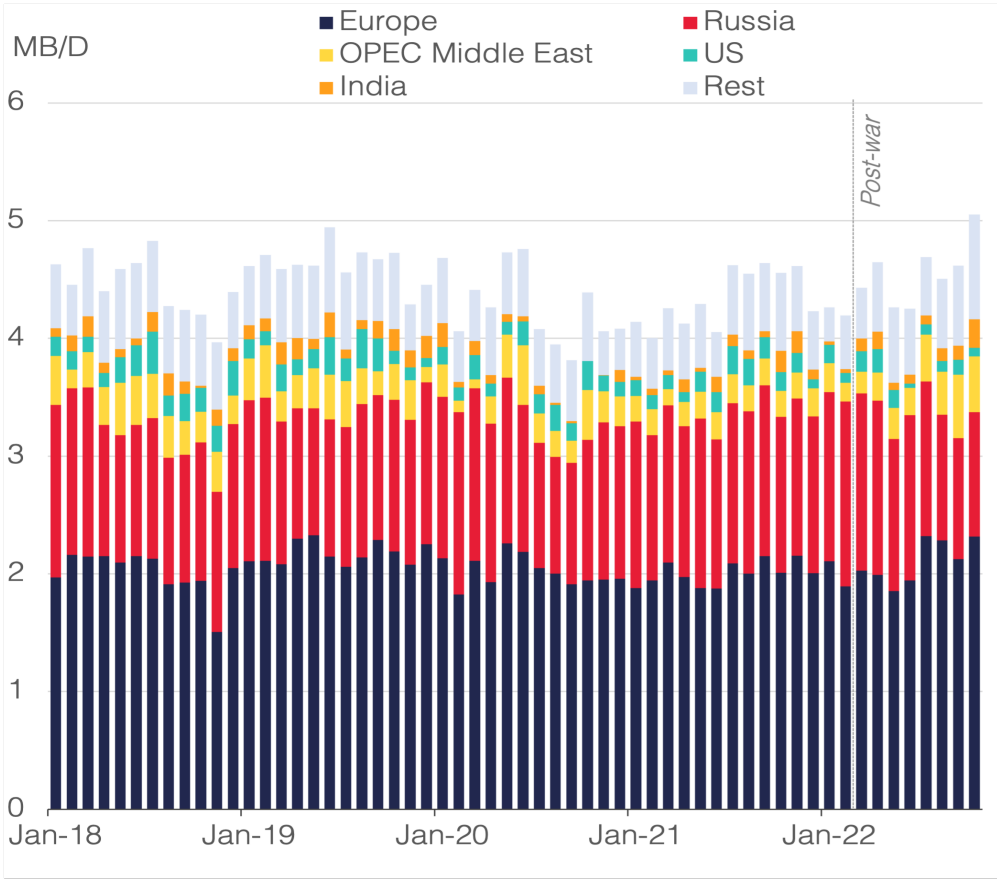
Russian products exports have declined

Russia product exports by destination



Source: Kpler, OIES

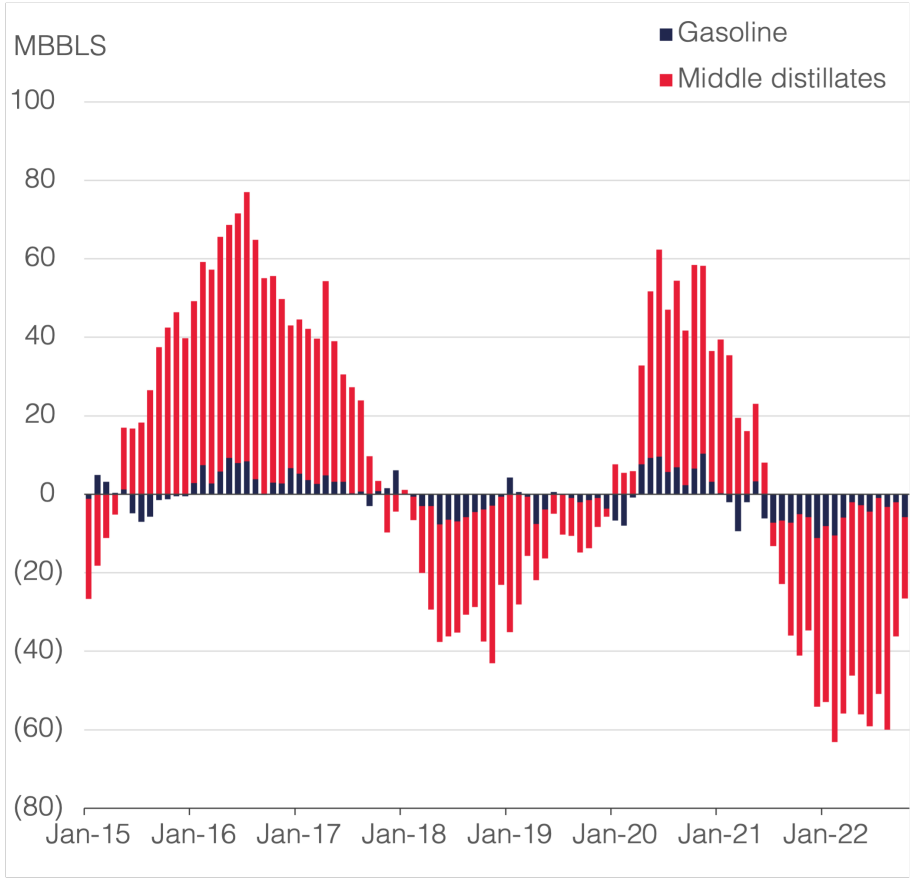
EU-27 product imports from origin



Source: Kpler, OIES

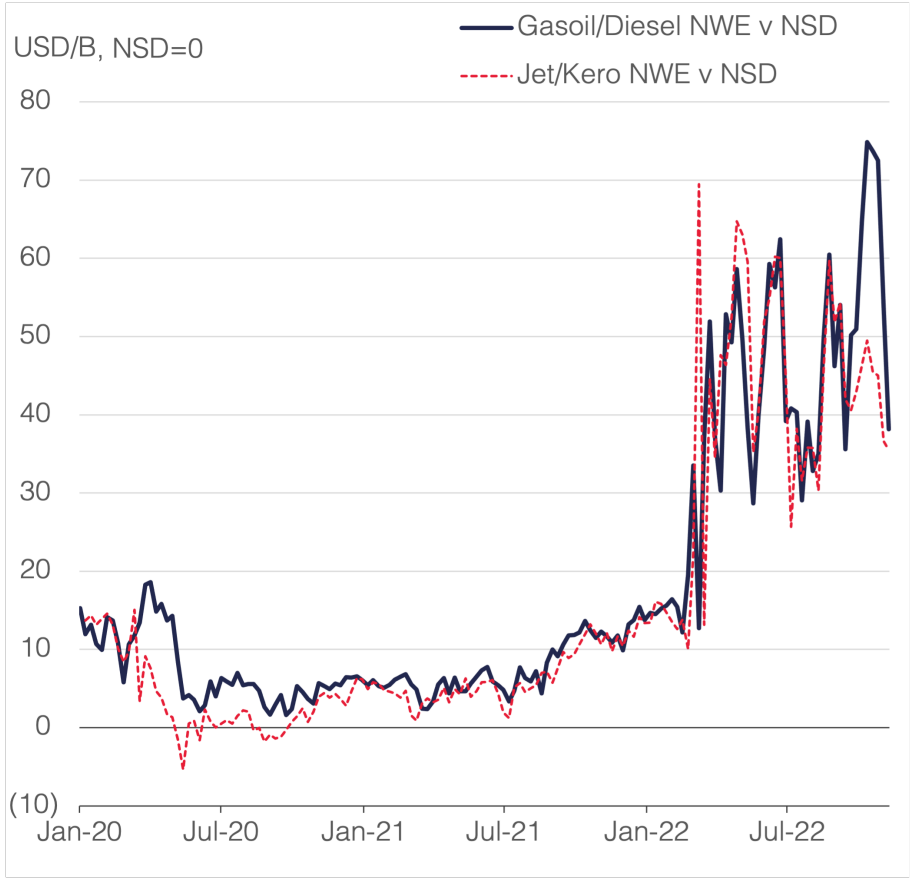
EU products market remain tight

OECD Europe product stocks v 5-year average



Source: IEA, OIES

Gasoil/Diesel and jet margins NWE

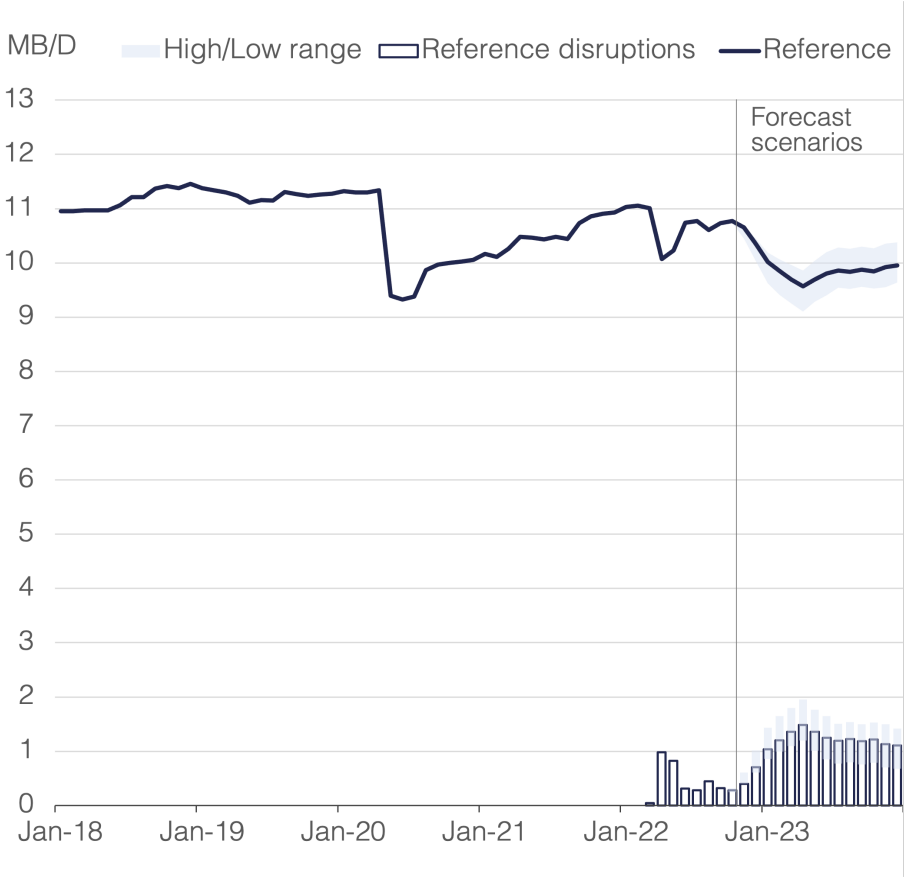


Source: Argus

EU Embargos and Russian supply disruption

- As EU embargo comes into effect will we witness a more severe supply disruption from Russia?
- Re-routing additional Russian crude from West to East can put strain on logistics (shipping; access to Aframax tankers)
- Finding insurance coverage outside EU/ G7 challenging
- Russian exports to Asia concentrated into two countries (China and India; how much additional crude wiling to take?)
- Will Russia respond by cutting production?
- Russian oil production declines towards year-end to 900,000 b/d below pre-war levels before disruption peak in February 2023 when EU sanctions are in full effect to average 1.25 mb/d in 2023

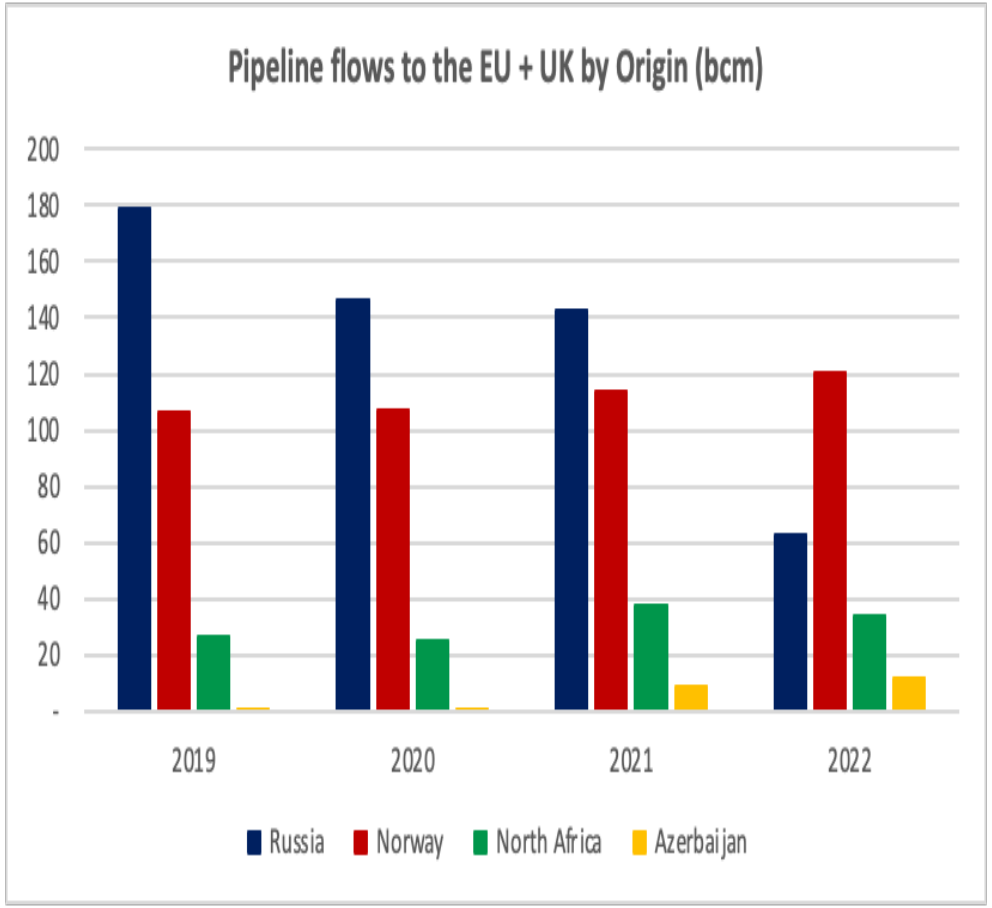
Russia oil production scenarios



Source: OIES

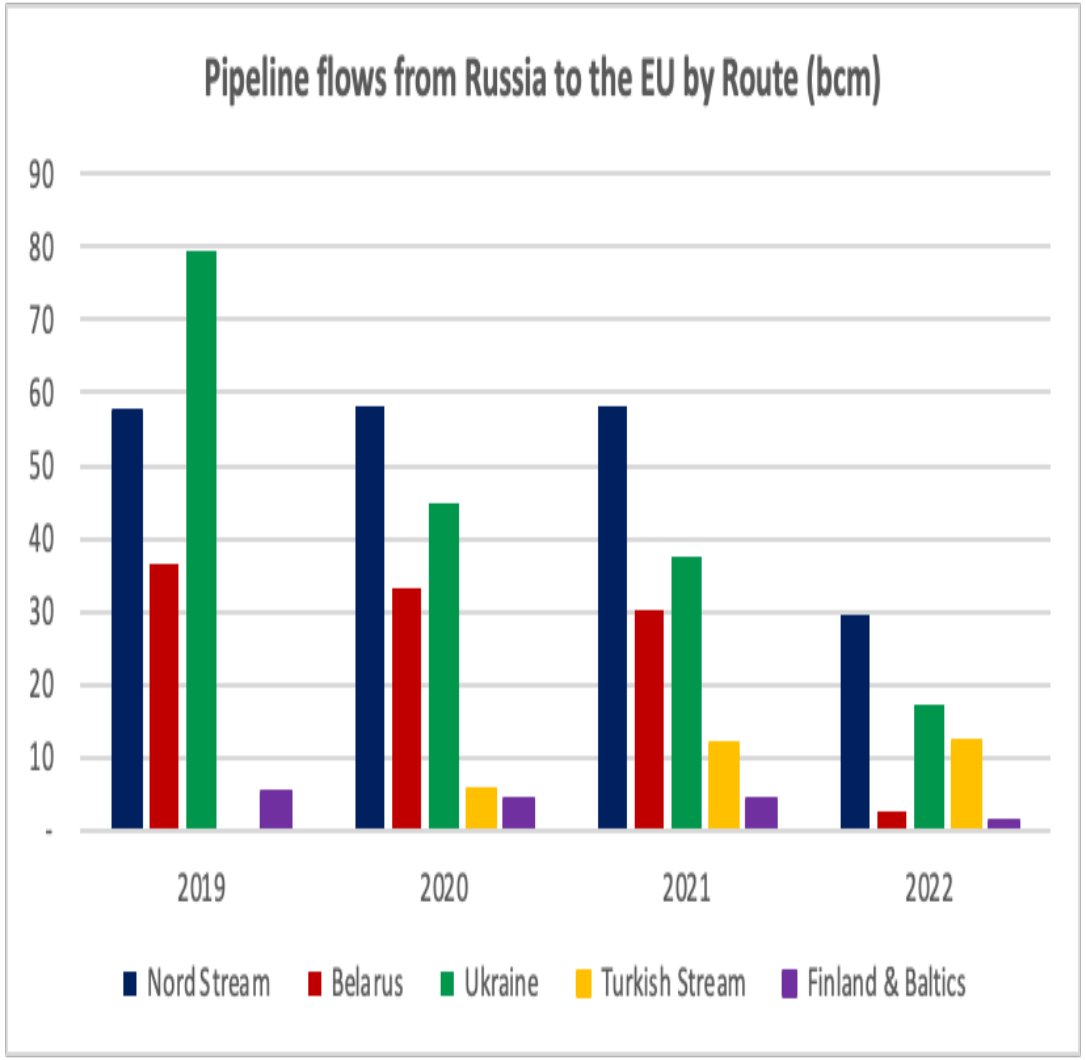
Big impacts on European gas supplies

- Sharp decline in Russian pipeline flows to Europe in 2022
- Pipeline flows from Norway to EU have been at full capacity (outside a period of offshore maintenance in September)
- New Baltic Pipe to Poland via Denmark will divert some Norwegian flows away from Germany
- But Poland was importing pipeline gas from Germany so there is no net loss in Norwegian supply
- Algeria's domestic gas balance left smaller volumes available for export in 2022 compared to 2021 and smaller pipeline exports and LNG exports from Algeria to EU
- Pipeline flows form Azerbaijan via the Trans-Adriatic Pipeline (TAP) remain at full capacity



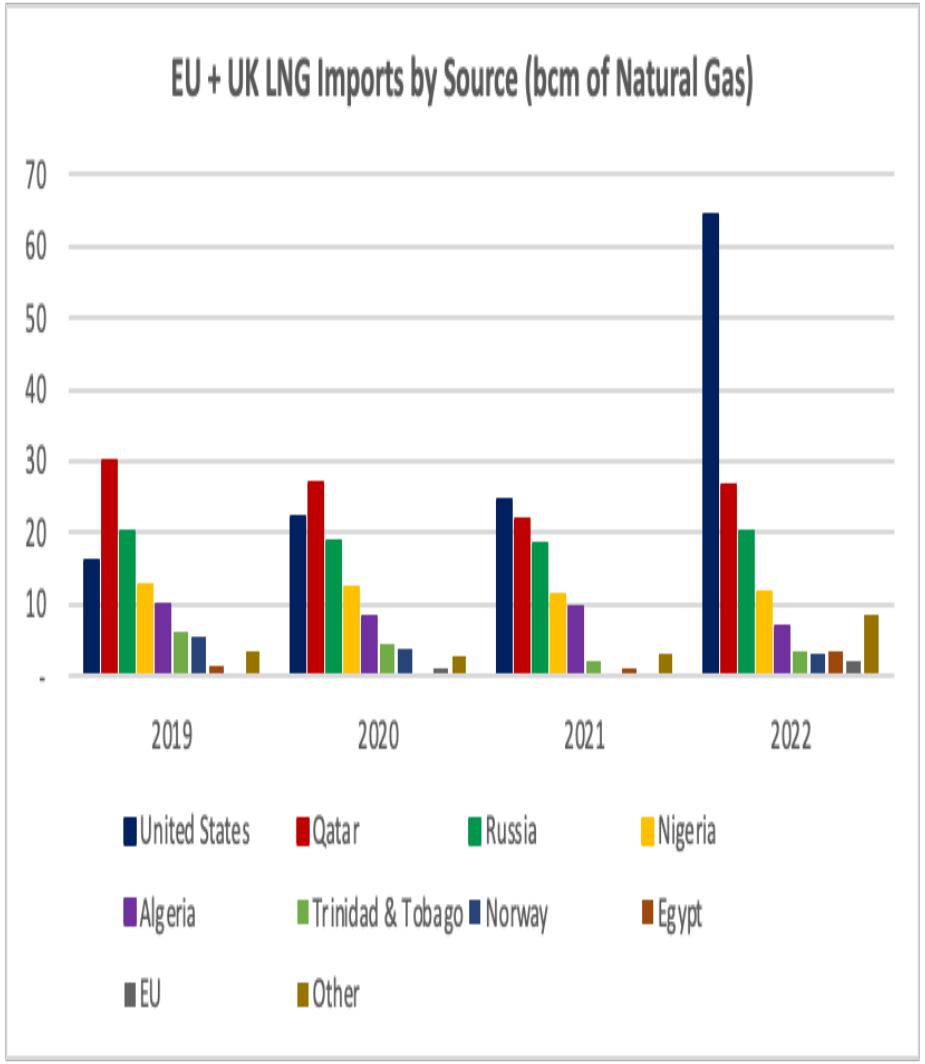
Russian gas supplies to Europe

- Russian flows are unlikely increase and downside risk regarding transit via Ukraine
- Gazprom holds a transit contract with Naftogaz which is pursuing commercial arbitration against Gazprom
- Gazprom threatened Naftogaz with Russian sanctions
- Could cause transit for Russian gas via Ukraine to halt
- Overall little scope for additional pipeline supply beyond current levels in 2023



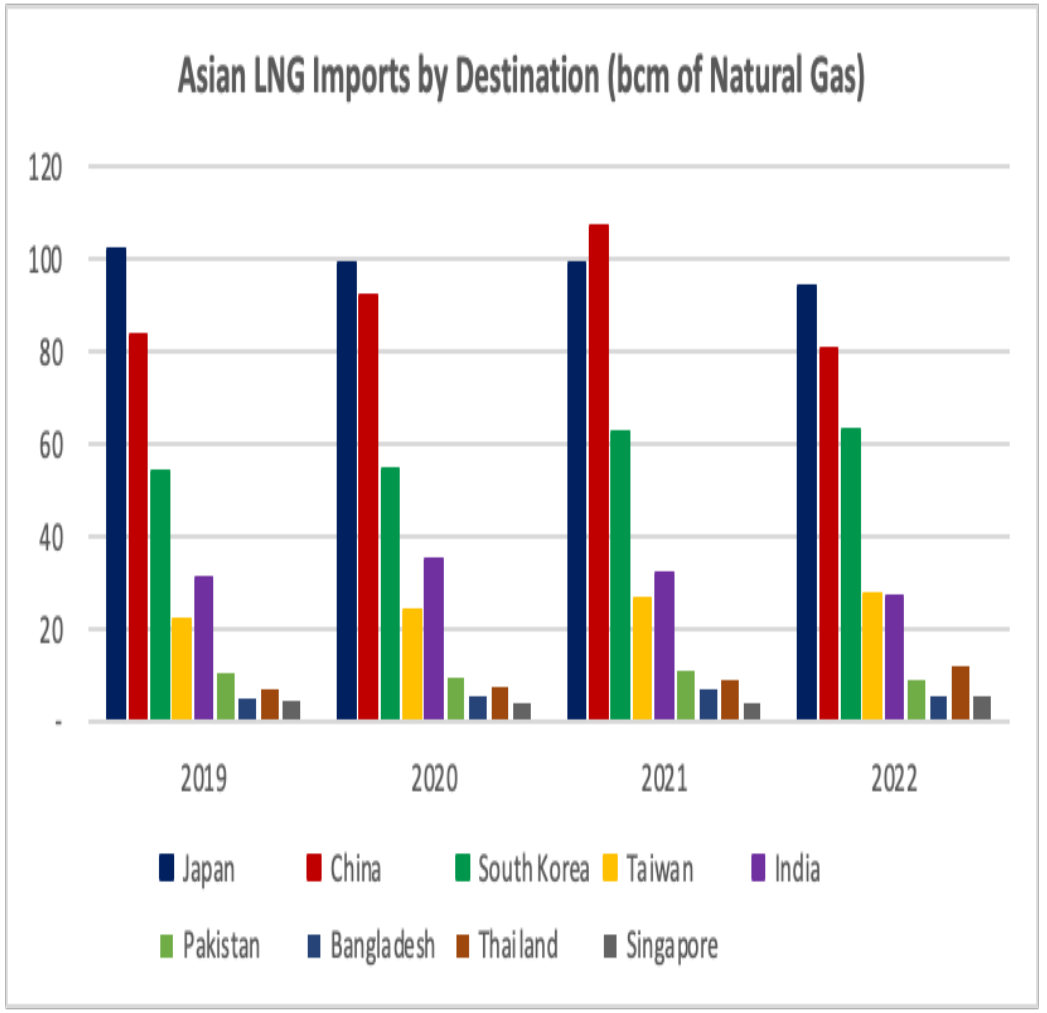
Sharp rise of LNG imports in Europe

- LNG exports from US grown substantially from 1.5 bcm in 2016 to 93 bcm in 2021
- Year-to-date (January-October) LNG exports from US grown from 77 bcm to 87 bcm from 2021 to 2022
- High European prices attracted more US LNG to Europe
- Europe benefits from growth in US LNG exports and that plenty of US LNG is offtaken by portfolio players with spot sales optionality
- European imports from Qatar in 2022 likely to be higher than in 2021 but lower than in pre-COVID 2019 (if Nov & Dec volumes are the same as Oct)



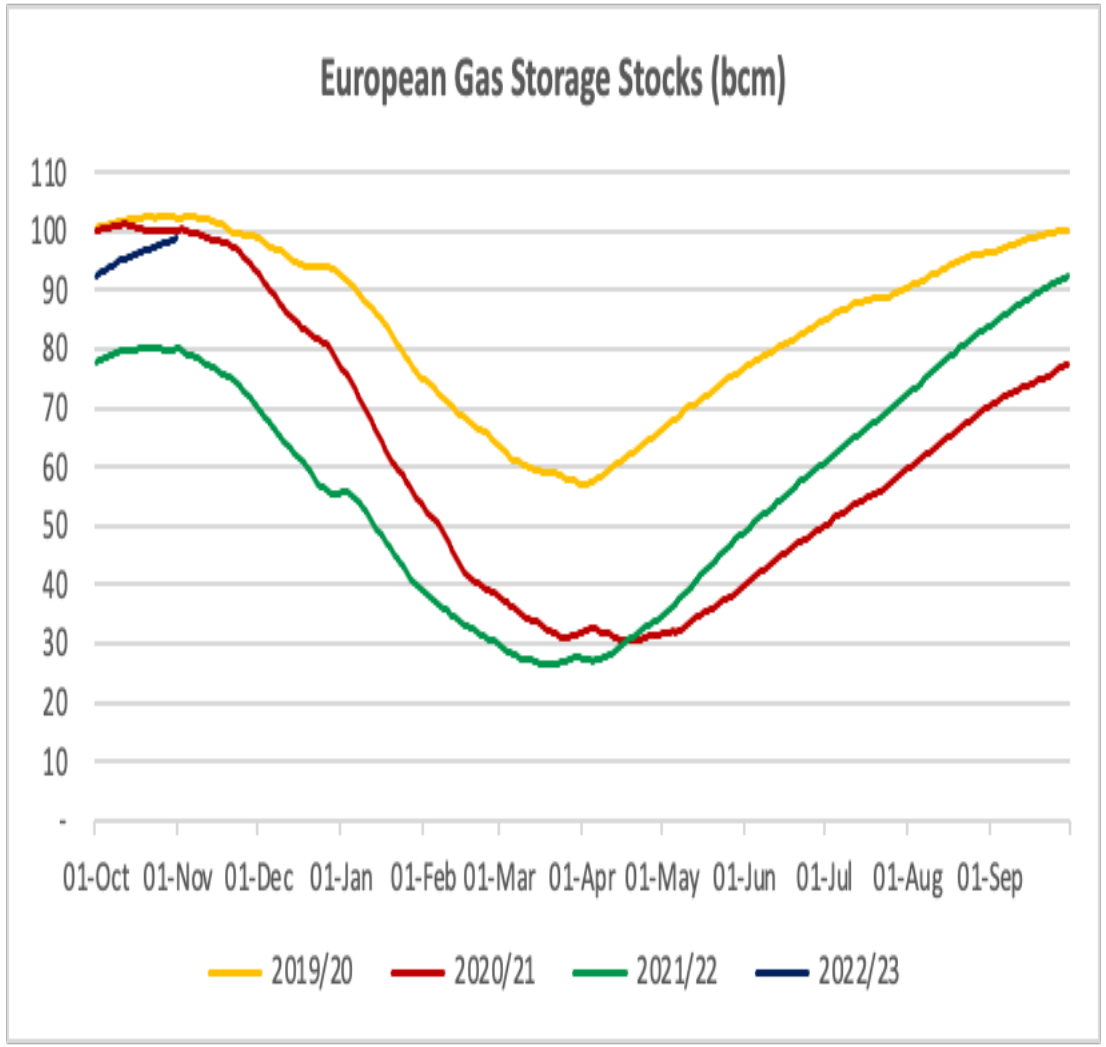
Decline in Asian LNG imports

- Dramatic year-on-year decline in Chinese LNG imports
- Driven largely by Chinese economic slowdown and 'Zero-COVID' policy
- LNG is China's marginal gas supply behind domestic production and pipeline imports from Central Asia & Russia
- Combined LNG imports into India, Pakistan, and Bangladesh suppressed by high prices



Multi-year crisis

- European storage stocks on 1 November (99bcm) back at level of 1 November 2020; slightly below record of 1 November 2021 (102 bcm)
- Strong political push to get gas into storage in summer 2022 & fears for winter 2022/23
- Looking ahead volume of gas left in European storage at end of winter (1 April) a key issue
- Determines how much Europe needs to inject in summer 2023 and how high stock levels will be on 1 November 2023
- Less Russian pipeline supply in Q2-2023 than in Q2-2022
- LNG supply in summer 2022 depends on demand for LNG outside Europe especially in China



Global Cooperation on Climate Change

Climate change diplomacy

- More polarized world which could impacting collaboration on climate policy
- Energy security and affordability taking centre stage
- Drive to limit dependency on foreign energy sources of energy and minerals
- Relocation and localization of supply chains (impacting the cost of the transition)
- Fiscal constraints and debt burdens
- Developed-developing countries tensions on climate finance (mitigation, adaptation, and loss and damage)