

Net zero transition impacts on global geopolitics and energy security

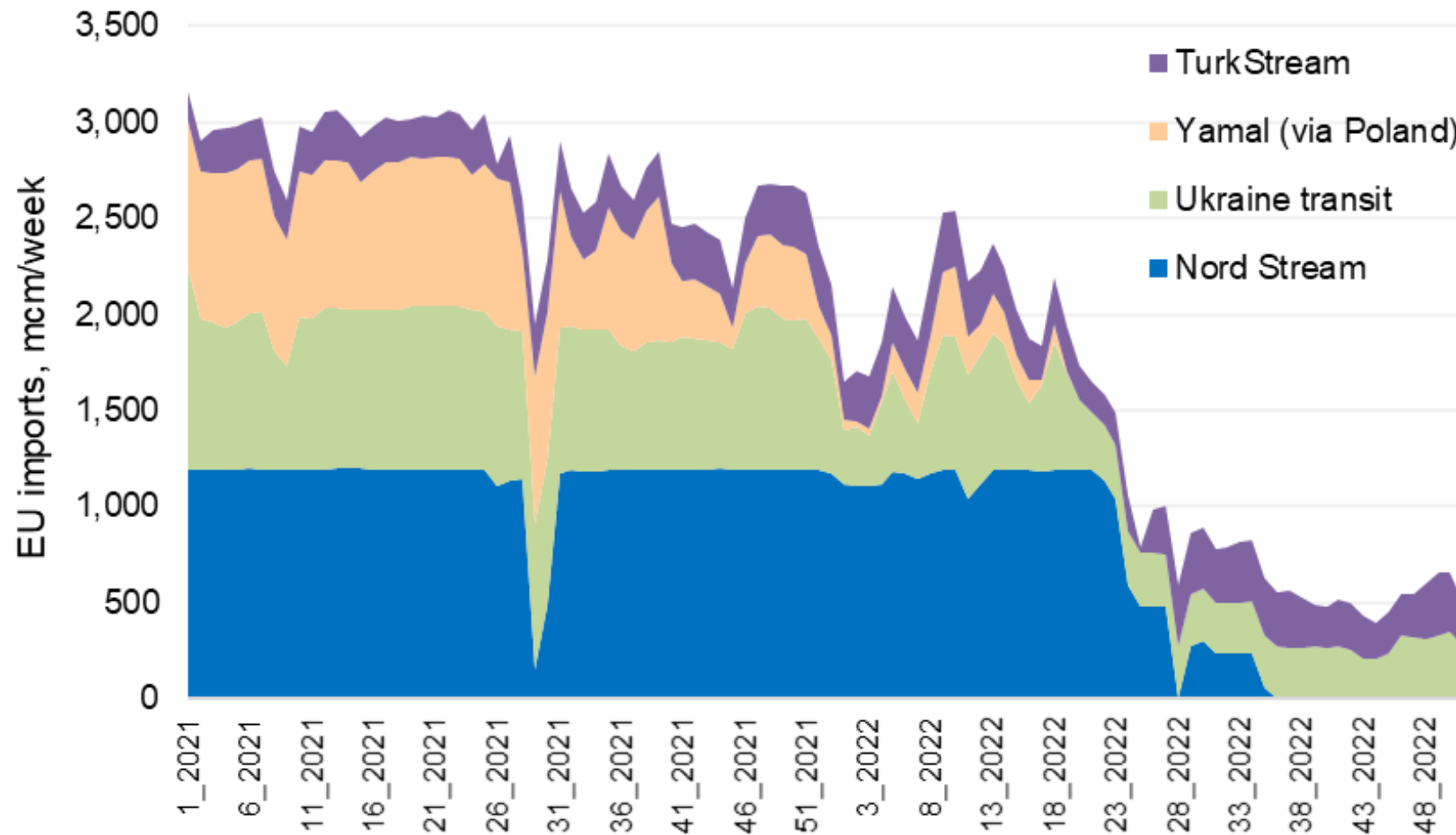
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Take-away 1: There will be long-term geopolitical consequences of the Russian invasion of Ukraine for the energy trade, but they are not clear



Pipeline gas imports to the EU from Russia, 2021-22. Source: [Bruegel](#)

We examined two scenarios of future Russian gas trade

Limited Markets (LM)

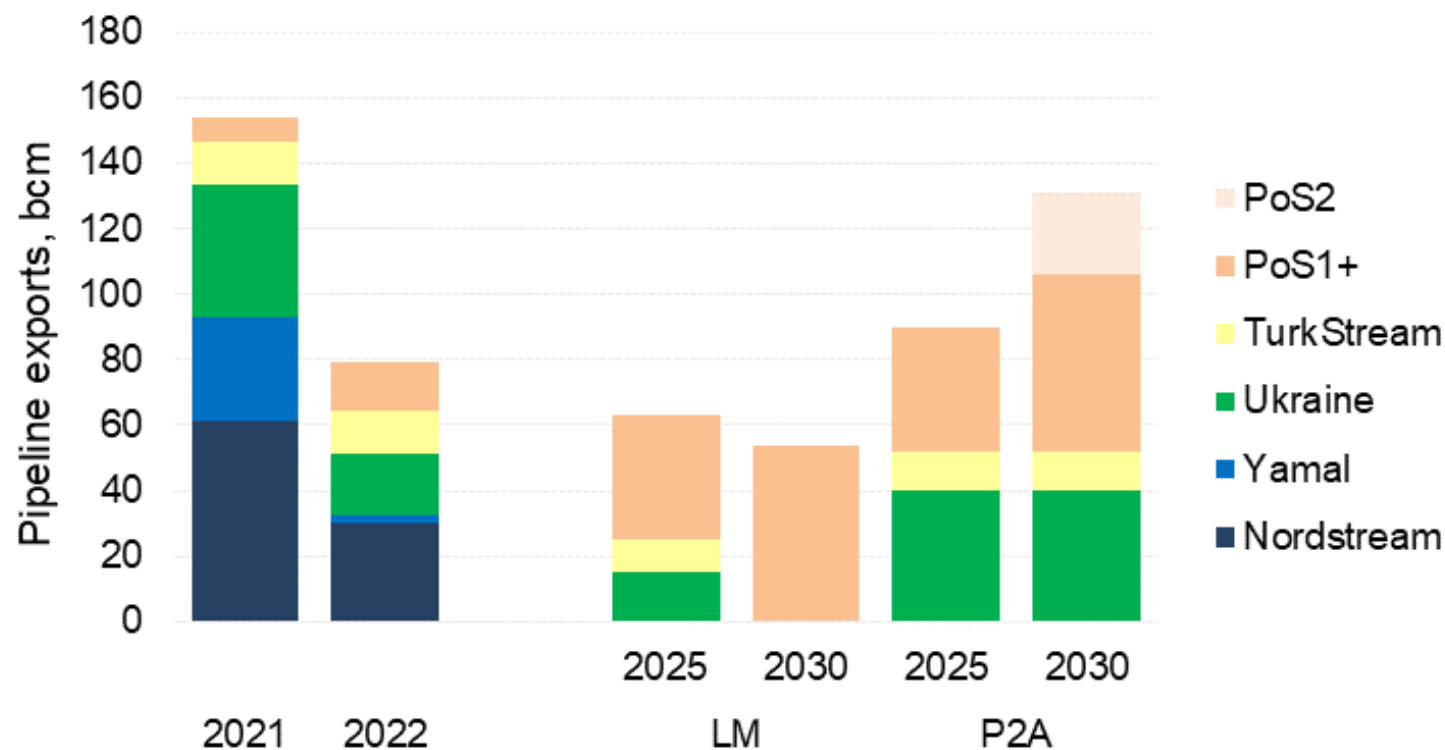
- Protracted conflict in Ukraine
- EU permanently ceases gas trade with Russia by 2030
- Options to expand exports east or increase LNG capacity limited
- OECD countries stop taking Russian LNG cargoes

Pivot to Asia (P2A)

- Cessation in conflict but disputes continue in occupied territory
- Flow of pipeline gas via Ukraine and Turkstream (2021 level)
- Pivot towards China, with expanded pipeline capacity
- No political-related restrictions on LNG

Russian gas exports in the LM & P2A scenarios

- Power of Siberia (POS1) pipeline will eventually export 38 bcm gas to China.
- POS1+ includes two extensions, with one from Sakhalin, increasing exports by 16 bcm.
- Power of Siberia 2 (POS2) construction is due to start next year, with a capacity of up to 50 bcm to China.



Pipeline gas export levels (2021/22) and future capacity.

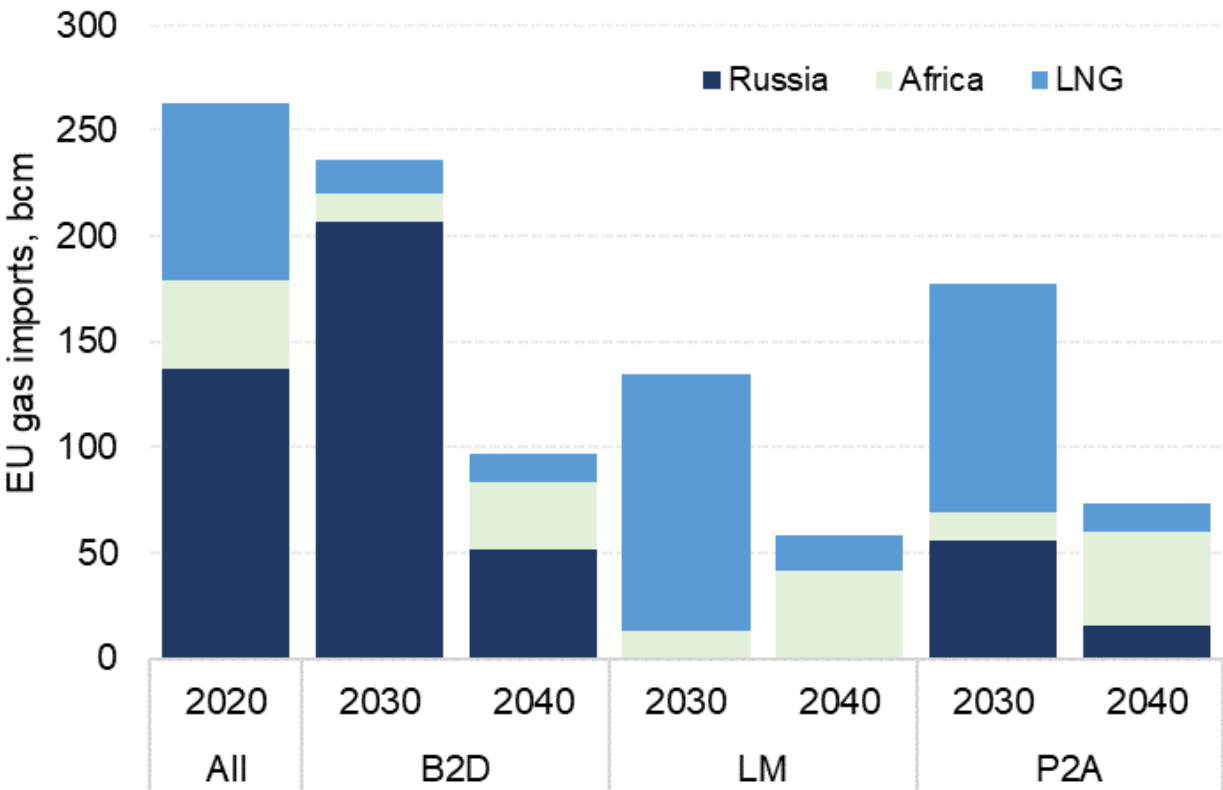
Source: Bruegel, ENTSO-E, Eurostat (for 2021/22).

Exploring global implications of scenarios

- We examined the global implications of these scenarios using the TIAM-UCL global energy system model.
- We assumed the international community makes efforts to hit a 'well below 2 °C' target.
- For global gas production, production peaks at around 4000 bcm in 2030 then declines 70% by 2060.
- We compared the scenarios to a reference case *B2D*, which assumes resumption of business-as-usual Russian gas exports.

EU: has reduced demand plus supply diversification

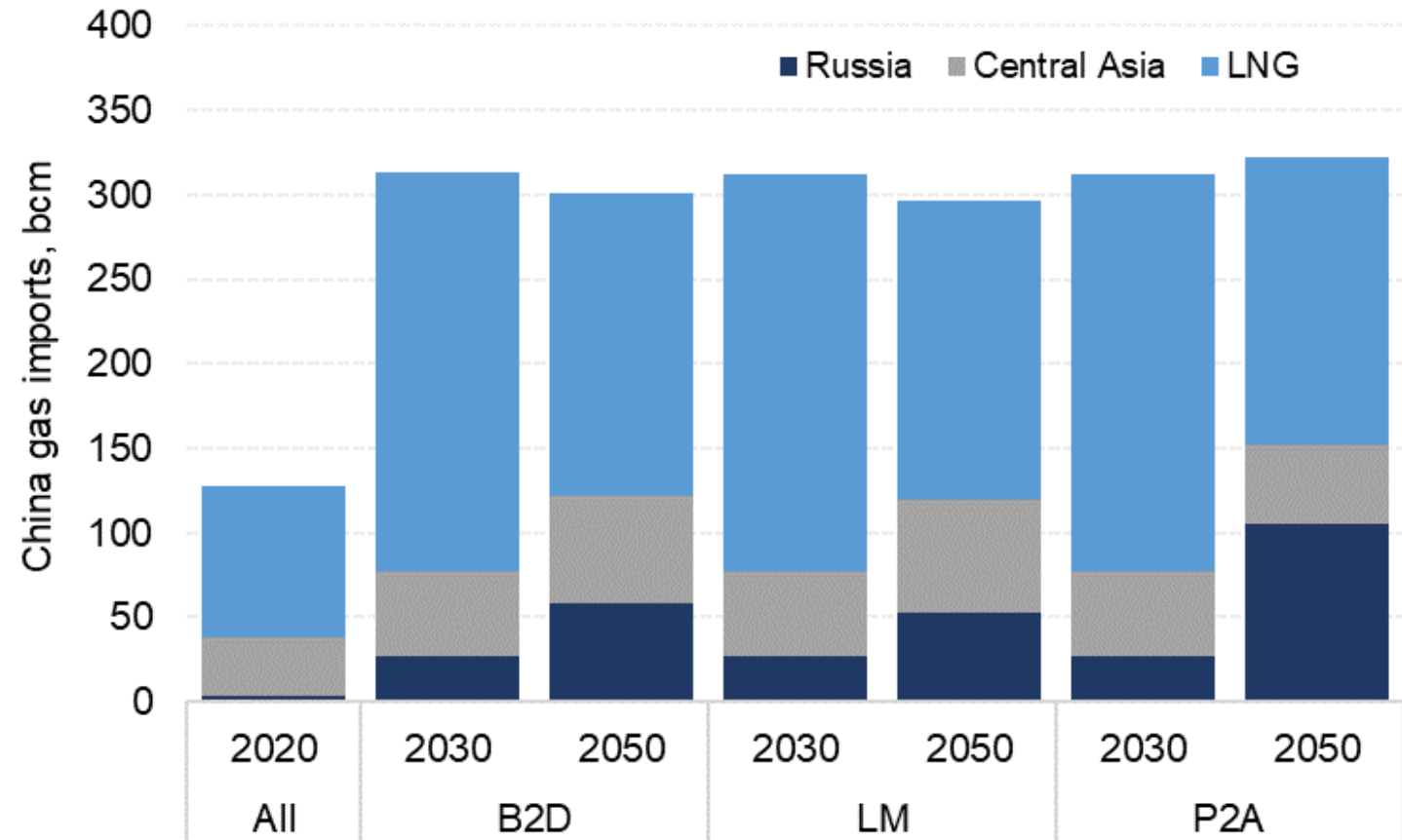
- Reductions in gas demand; rate increased by lower import capacity
 - Will reductions increase and be sustained?
- Increased dependency on LNG, with cargoes mainly from USA and Middle East



EU gas import levels by scenario.
Source: TIAM-UCL modelling

China: demand growth means it drives global trade

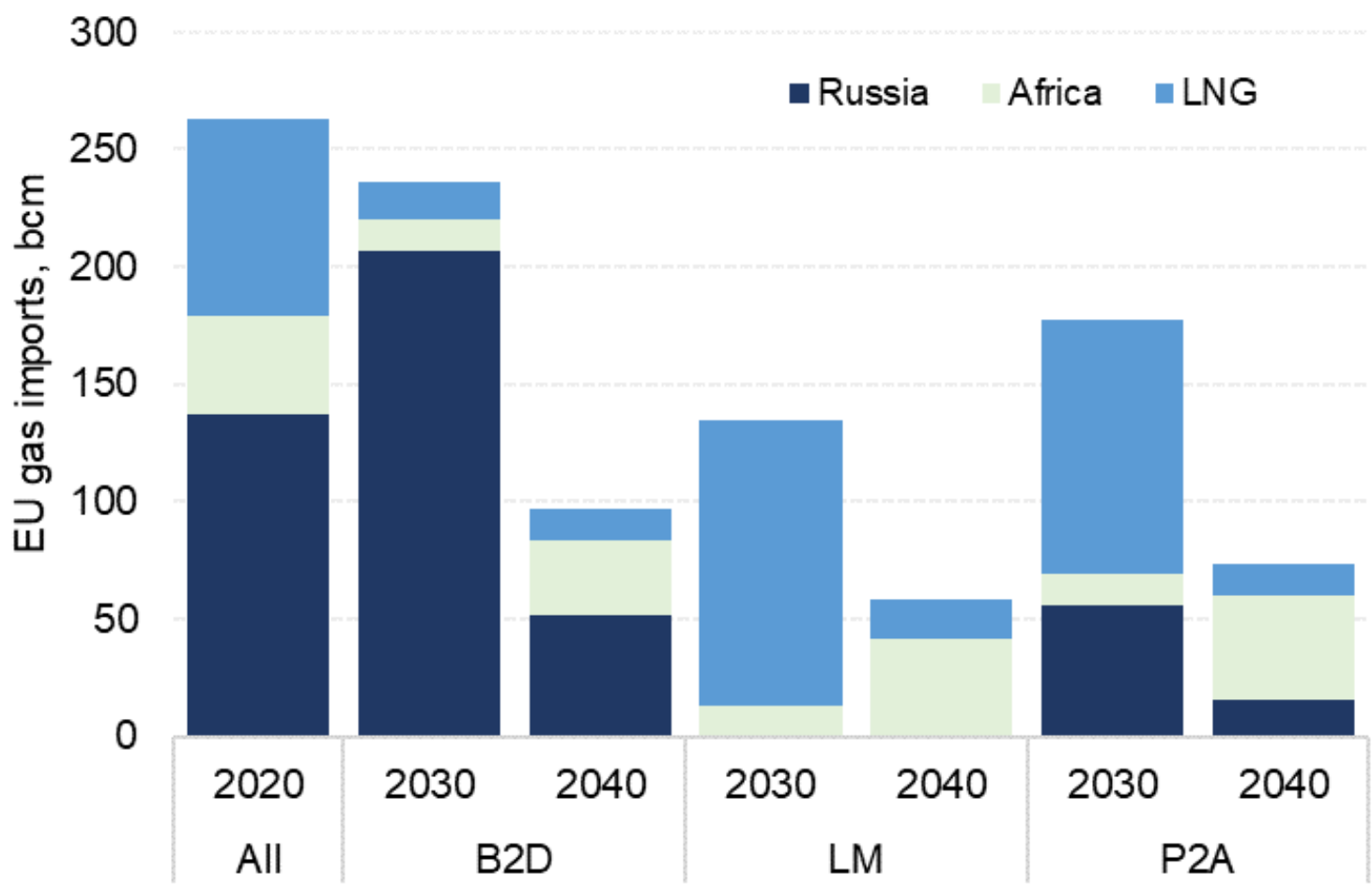
- Ramp up in LNG in all cases by 2030 – moderated by extra pipeline capacity.
- The projection that total demand will rise to around 550 bcm in the 2030s is very uncertain – with the impacts in the LNG market.
- LNG is key for European energy security but looks volatile in the coming years.



China gas import levels by scenario.

Source: TIAM-UCL modelling

Take-away 2: It is not clear how fossil fuel producing countries will respond to falling demand during the low-carbon transition



Will there be a just transition in which reduced output is shared?

...or will some countries try to support their economies by flooding the market with cheap oil and gas to undermine the low-carbon transition?

Article


Unextractable fossil fuels in a 1.5 °C world

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 Check for updates

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Parties to the 2015 Paris Agreement pledged to limit global warming to well below 2 °C and to pursue efforts to limit the temperature increase to 1.5 °C relative to pre-industrial times¹. However, fossil fuels continue to dominate the global energy system and a sharp decline in their use must be realized to keep the temperature


Is cooperation necessary to underpin the transition to a low-carbon economy?

- A range of organisations publish global energy scenarios: e.g. BP; Equinor; IEA; Shell.
- The scenarios rarely consider geopolitics. Where they do, they tend to assume that global decarbonisation is achieved in “co-operative” scenarios but not in “competitive” scenarios.
- Does the impacts of the US Inflation Reduction Act undermine these assumptions?
- Carbon Border Adjustment taxes are also being developed to offset competitive behaviour.



Take-away 3: a new low-carbon energy geopolitics could emerge, particularly for hydrogen

Energy commodity	CO ₂ emissions	Resources limited to few countries	Market scale
Oil	High	Yes	Global
Natural gas	Medium	Yes	Regional (LNG global)
Coal	High	No	Global
Biomass	Low	No	Global
Low-carbon electricity	Very low	No	Regional
Hydrogen and ammonia	Very low	No	Global



Geopolitics of the Energy Transformation

The Hydrogen Factor

