

Cambridge, December 2022

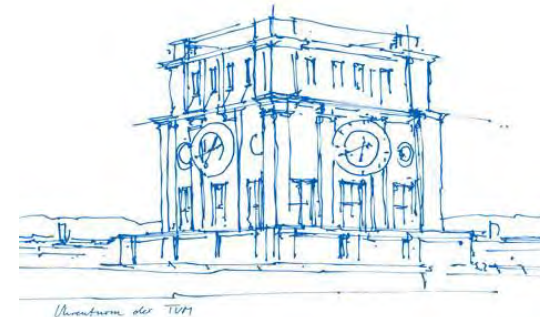
# The Future of Natural Gas in Europe

by

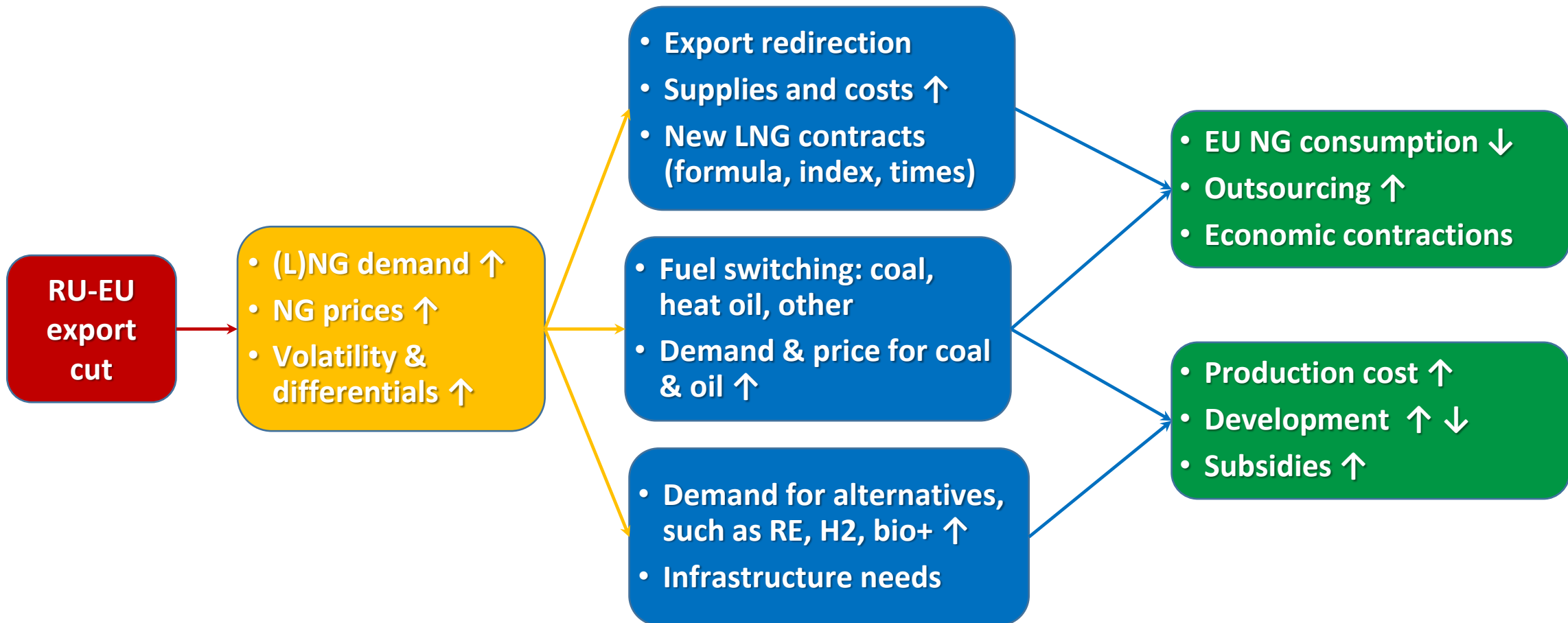
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*Support energy transition with research and education*



# Key Take-aways

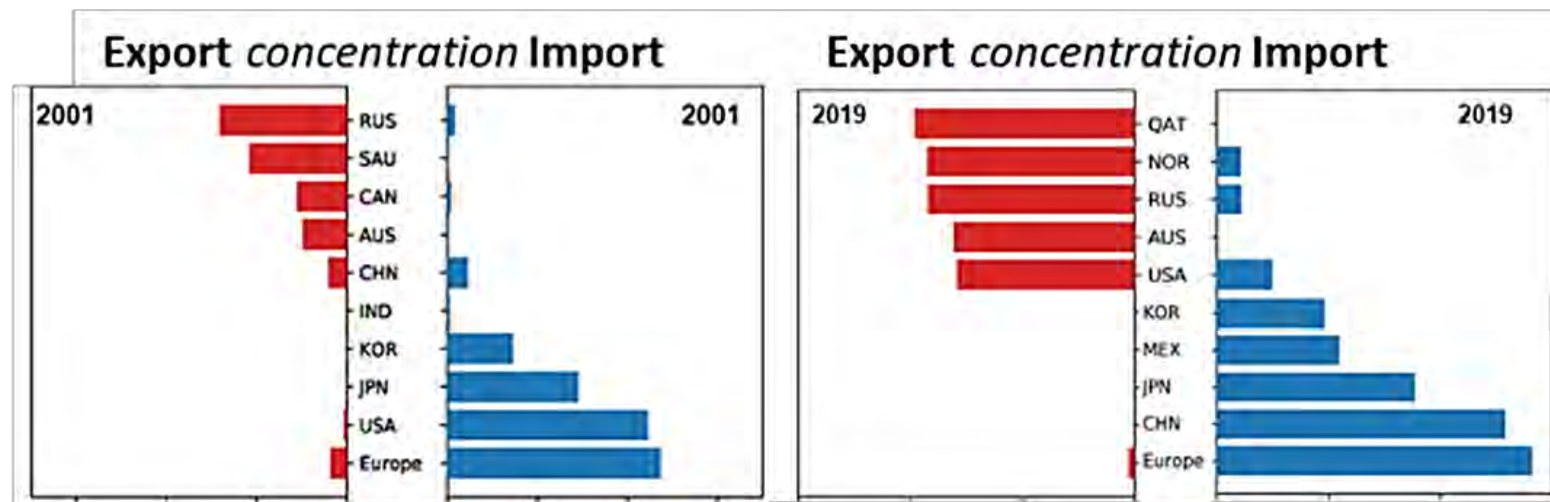


## Transformation of the global trade

### Buyers compete along with sellers in a-la bilateral oligopoly

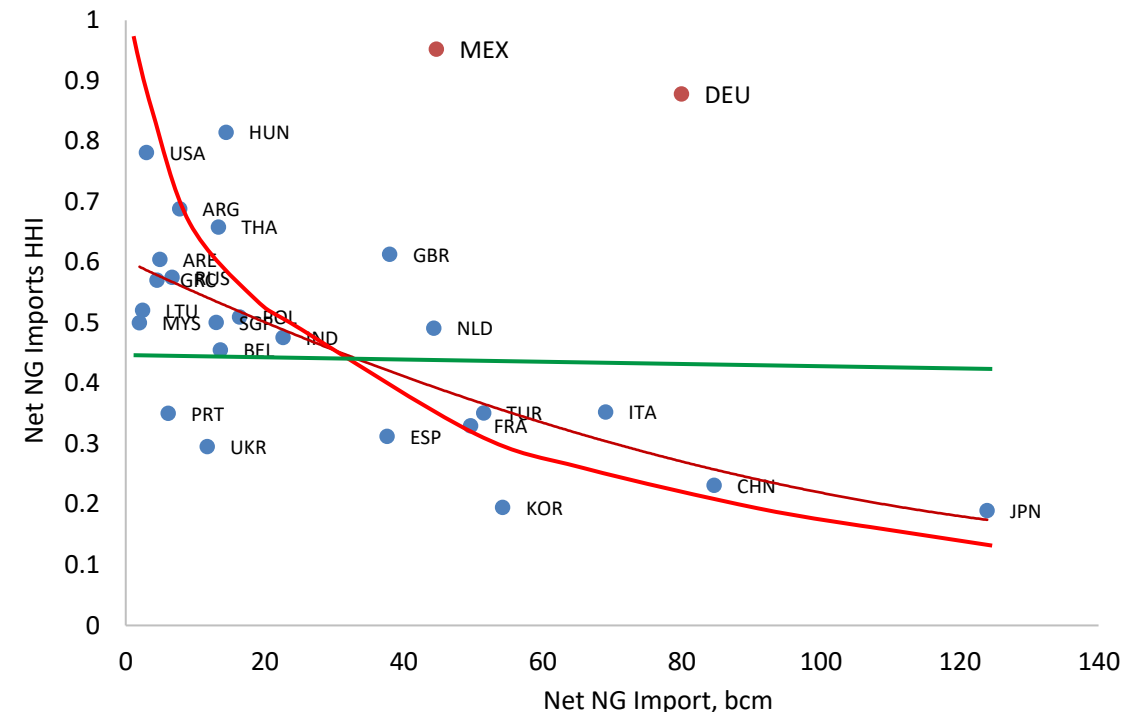
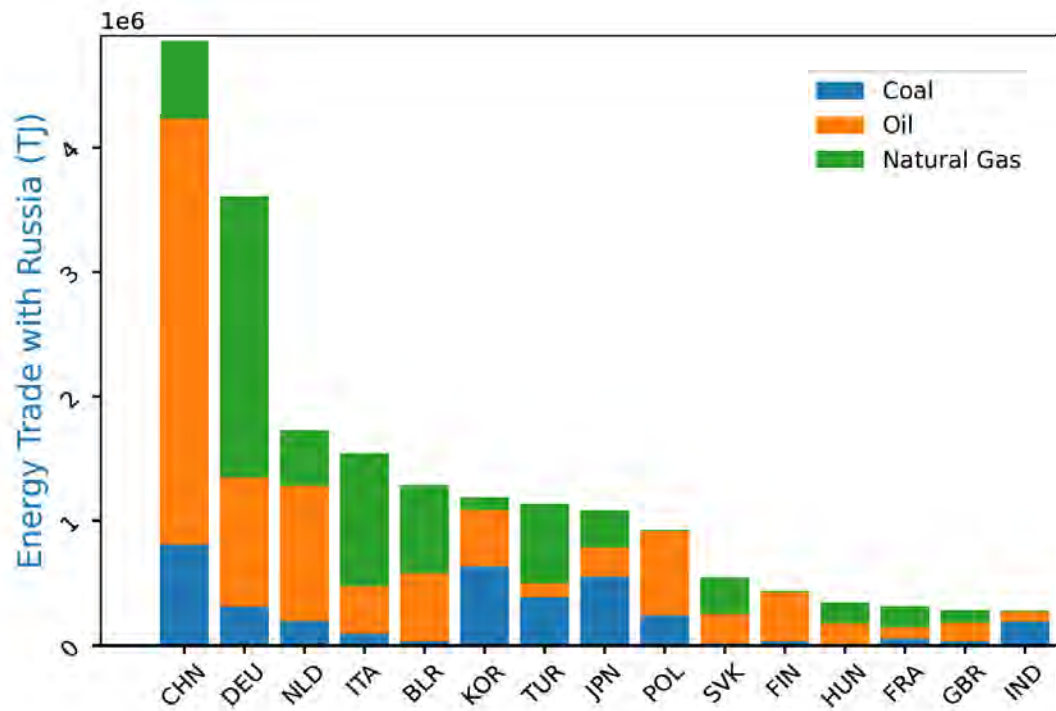
Energy transition and Asian growth have led to major shifts in the global energy markets, critical for the understanding of the current situation:

1. Buyer list and concentration evolved: China, India, others increasing in size, as EU shrinks
2. The regional markets became aware of each other with and the buyers' competition for limited in the short-term supply and storage, e.g. in 2020-2021 with Asian vs. EU buyers challenges owing to cold winter



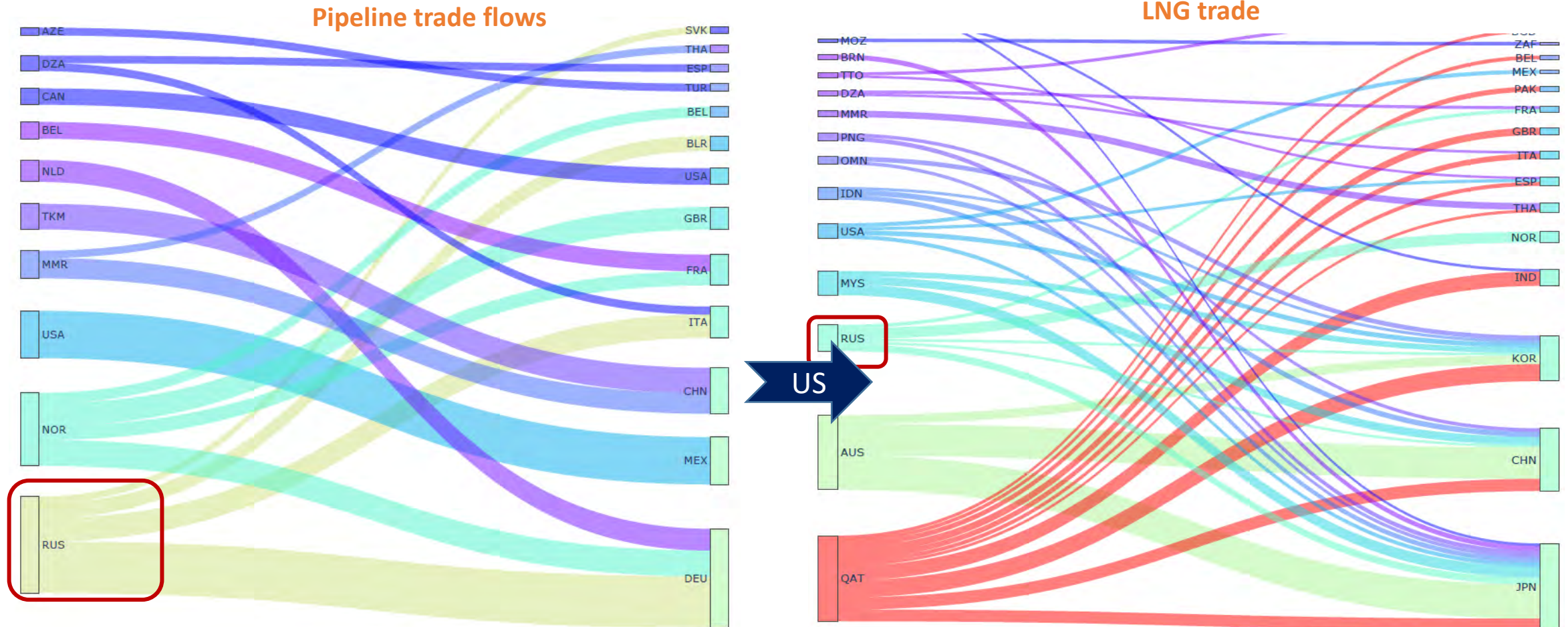
# Background: Diversification Failure

- Envisioning the transition away from *the fossil fuels but (not)* natural gas:
- Many countries push for ng-supply diversification through LNG, but was it enough?
- Germany enjoyed volume-discounts increasing imports from Russia, saving money for RE



# Russian position was strengthening with investments in pipelines to China and LNG

## Would US follow its steps? Or will EU change one partner for another?

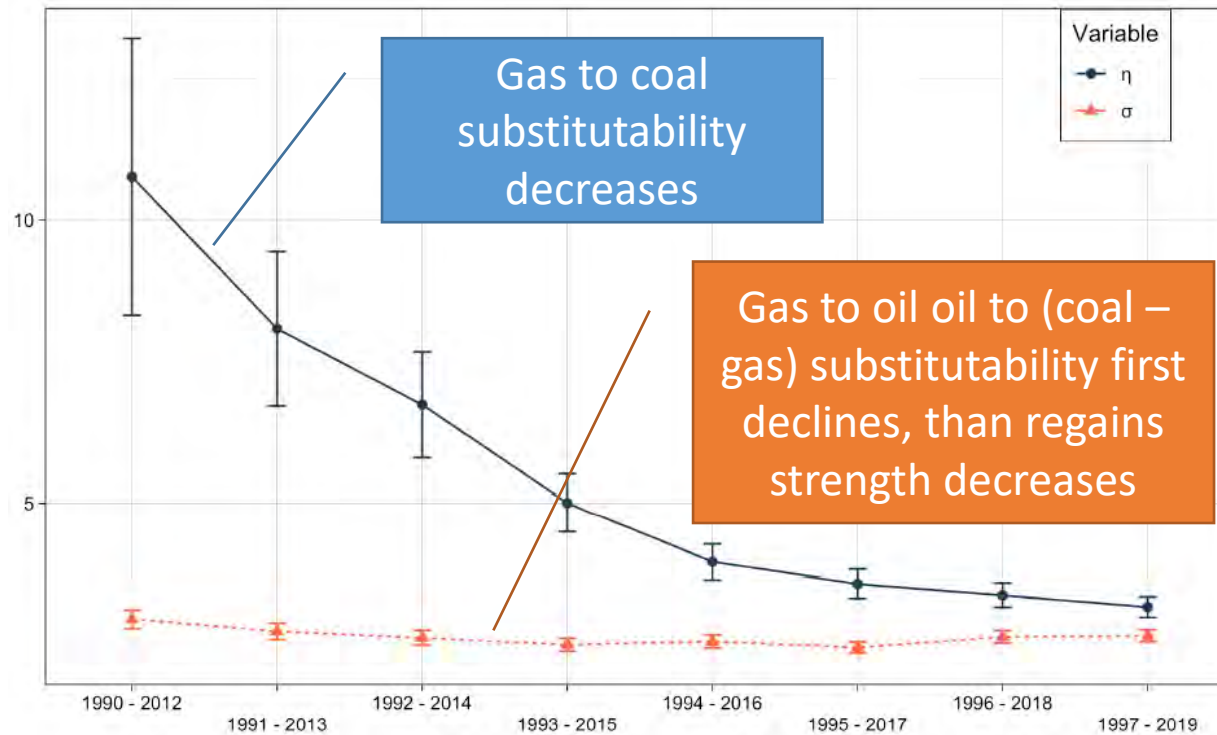




# The other side of diversification: Transformation of the global demand and supply

Energy transition and Asian growth have led to major shifts in the global energy markets:

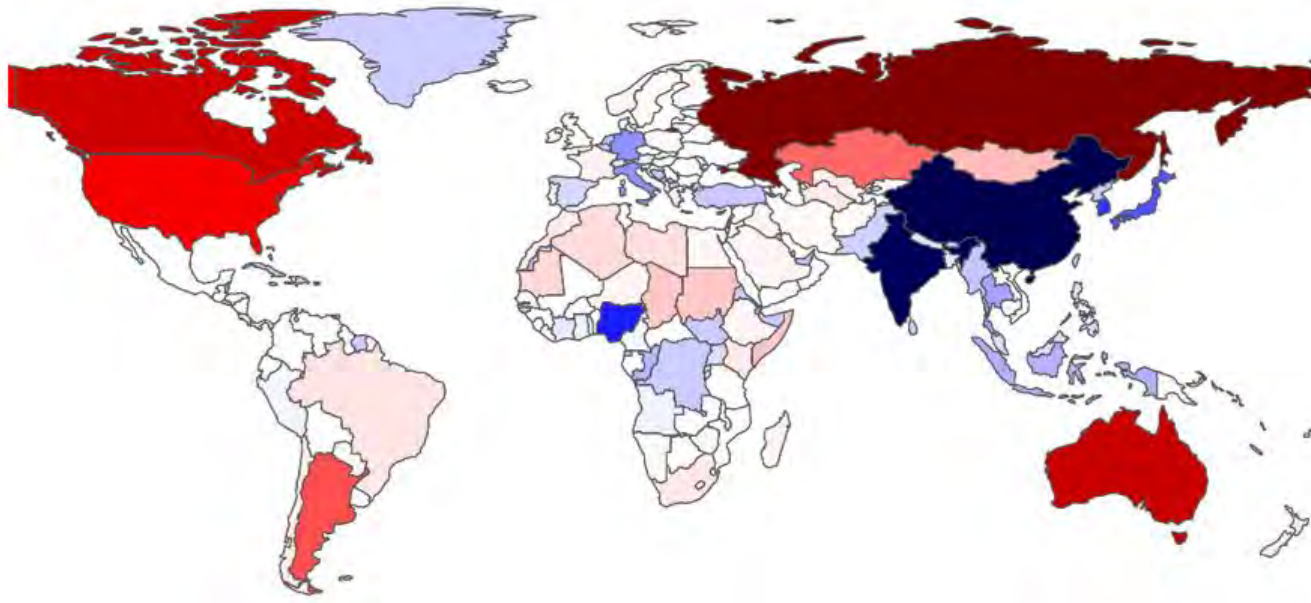
2. Rebalancing between oil vs. natural gas and gas vs. coal substitution



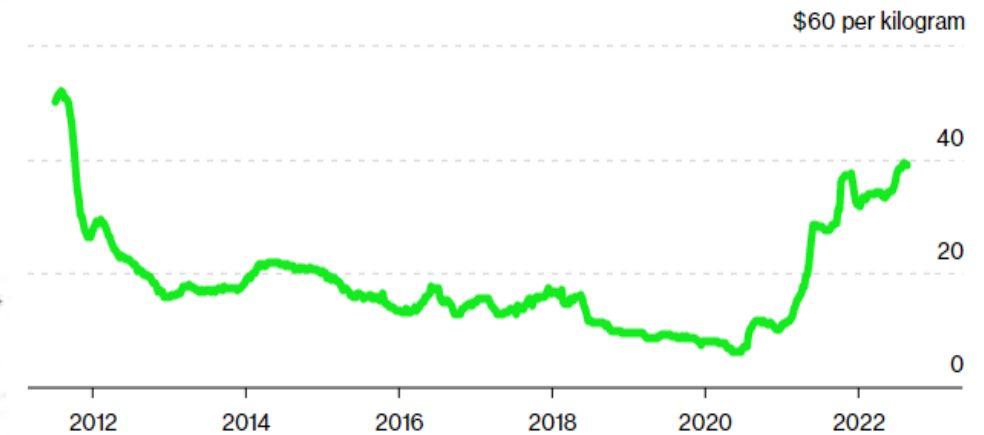
Gatcher & Ikonnikova, 2022

# The Energy Transition: RE Generation Potential

- The conversation about the geopolitical situation is co-mingled with the discussion on decarbonisation.
- Consider the RE generation potential and other clean energy alternatives and their likely costs.
- The existing assessments agree that the largest economies would have to import their clean energy and spend some of “current” energy to deliver.

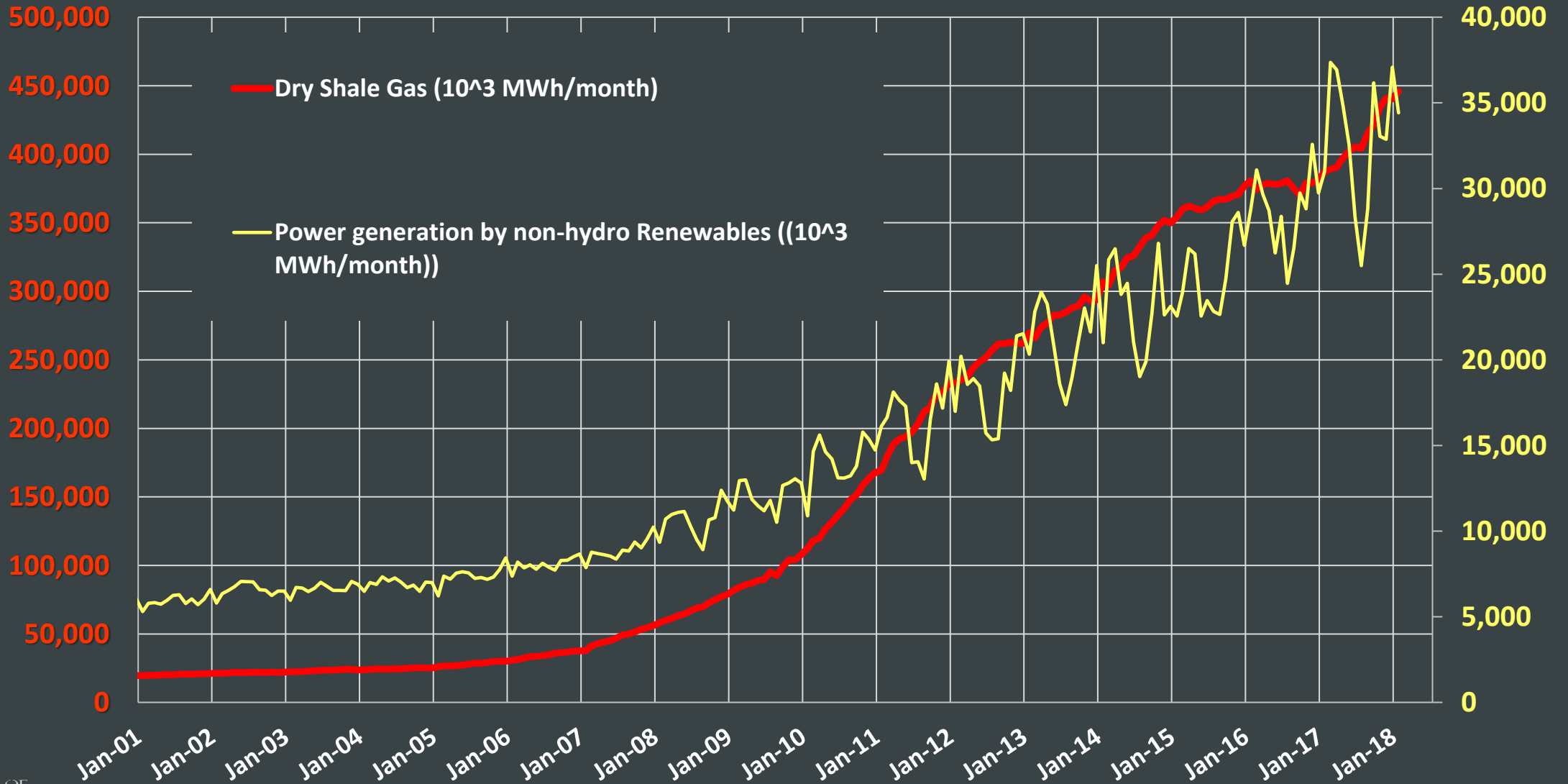


**Solar Polysilicon Prices Soar to Highest in a Decade**  
High cost of solar panel material may slow clean energy progress



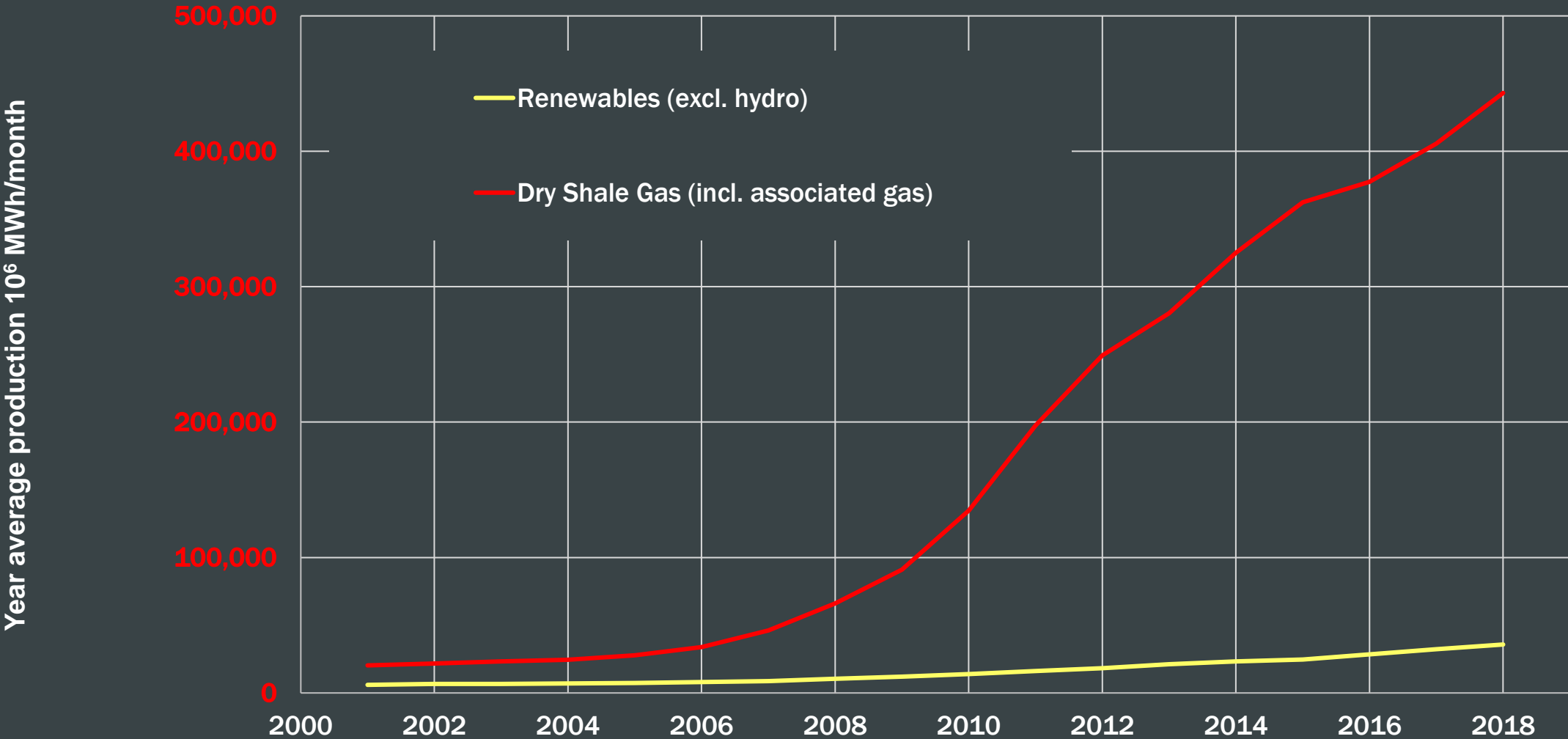
Source: BloombergNEF

# Based on the EIA data for the U.S.



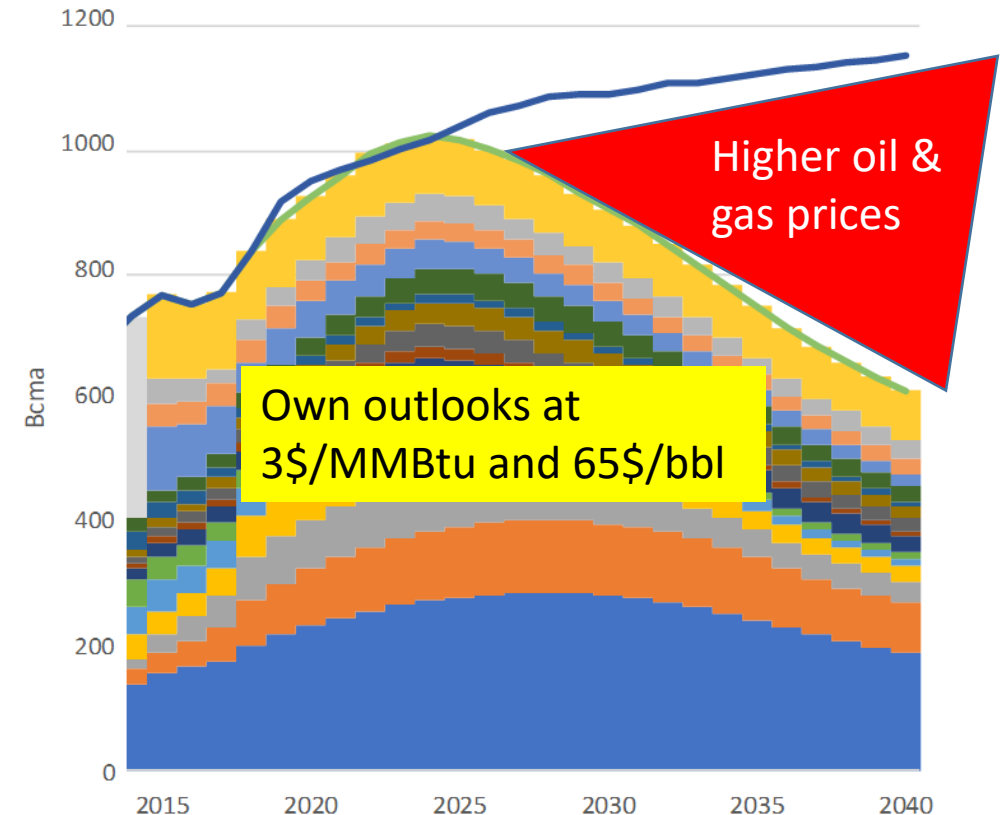


# Take a Closer Look: Year average on the Same Scale



## A Look into the Future

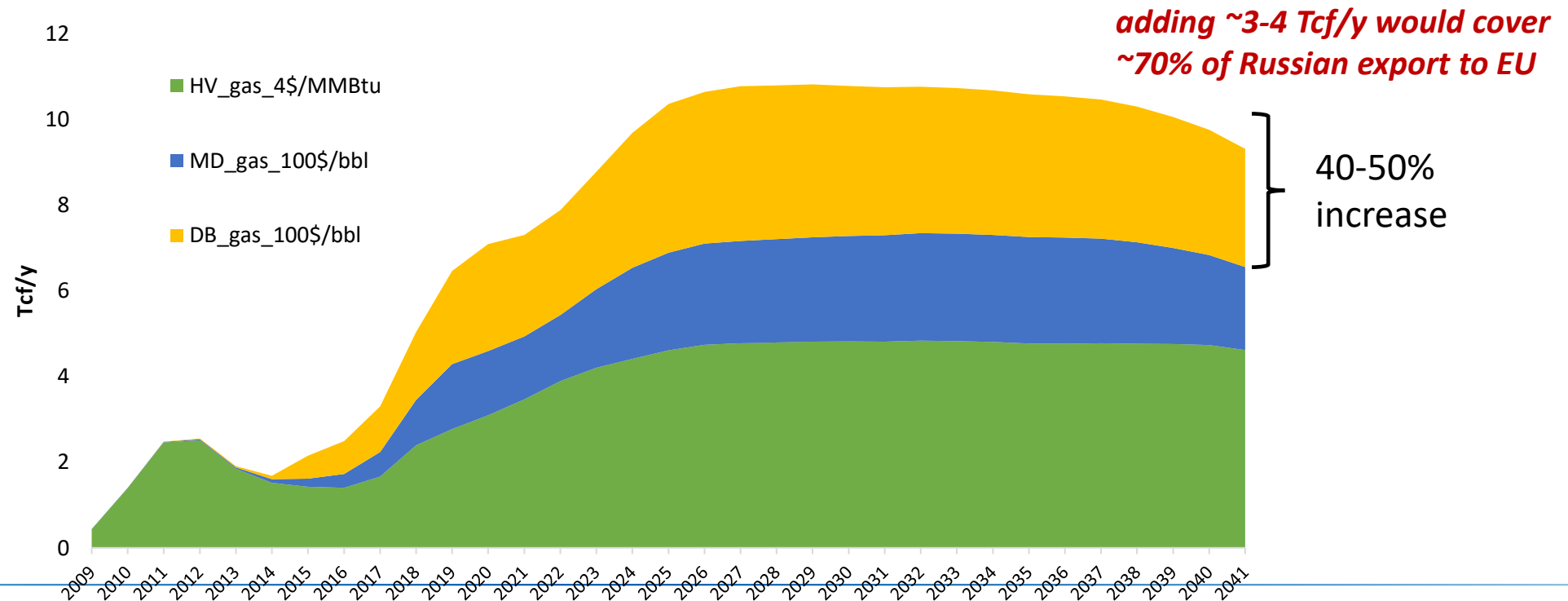
- The U.S. unconventional industry, especially Permian Basin, have **abundant resources**, playing increasing role in the global LNG market.
- However, with the production dynamics highly sensitive to **infrastructure constraints** and operators' willingness to invest: the **threat of transition** and demand uncertainty would lead to the need for higher prices to keep the demand.
- Besides, the U.S. natural gas supply will stay be dependent and **linked to oil**. Buyers will keep rebalancing their demand and maintain the portfolio of fuels for flexibility and liquidity reasons with pricing dependent on long-term vs. spot, multimarket vs. interfuel indexation.



*Ikonnikova & Rodgers, 2019*

# Natural Gas Combined Outlook

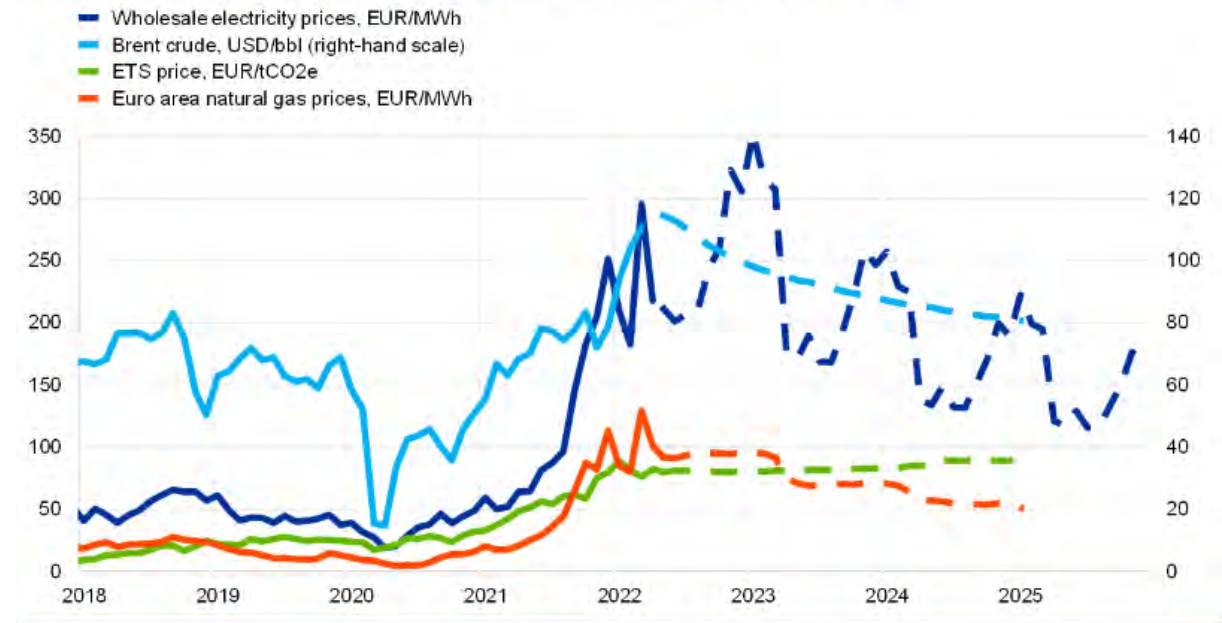
- The U.S. natural gas production has potential to compensate the loss of Russia, if infrastructure allows.
- The supply may be taken by Asian or redirected to EU market, with the multi-hub references in pricing formulas leaving the question on the plans for decarbonisation and volumes.
- The development of oil and natural gas demand and willingness to pay will shape oil-gas coupling.



# Our Analysis of the Future

- We look at the buyer-sells trade surpluses:
  - How buyers would allocate their demand to different energy sources?
  - How will buyers decide about spot trade vs. long-term contracted volumes (decarbonisation)?
  - How security considerations may push buyers to coordinate purchases, caps, etc.?
- Analytical view on the decisions:
  - Demand for energy is allocated to different fuels
  - Demand for each fuel is divided for long-term vs. spot
  - Markets are balanced, to determine the total traded volumes, which are distributed among the participants to optimize the concentration (characterizing the security).

(left-hand scale: EUR per unit; right-hand scale: USD per unit, monthly average values)



Sources: Eurostat, Refinitiv and ECB staff calculations.

Notes: Wholesale electricity prices for the euro area are calculated as a weighted average (weighted by net electricity generation) of prices observed in the five biggest euro area economies. Futures curves from 29 April 2022 are represented by broken lines. "ETS" is the EU Emissions Trading System, Latest observations: May 2022.

# Summary

Conditional on Russian natural **gas & oil volumes** on the market and **decarbonisation** by the key buyers:

- Natural gas consumption in EU is likely to shrink and never recover to the pre-war levels, with global competition defining the prices driven by the buyer demand distribution, caps and fuel “specialization”.
- As the number and size of sellers and buyers and their risks evolve, the balance between spot vs. long-term traded volumes will fluctuate along with hub-price (EU, HH, Asian) linkages.
- Financial and physical limitations to growing RE and H2, they are not likely to have dramatic impact on the market in the short-term. The long-term depends on where they will be developed.
- The linkage between oil and natural gas price would continue to change over time and will depend on how transportation + heating transition would develop and which resource fields supply those.