Session 2: Energy price volatility and energy sources in Europe

ECB Forum on Central Banking 2022: ‘Challenges for monetary policy in a rapidly changing world’

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History may come back … if so, as tragedy or farce?

Dash for gas stumbles on policy doubts

The energy business is entirely familiar with the concept of stranded assets. Now, however, a new concept has been introduced: the idea that some assets, specifically hydrocarbons, will inevitably be stranded and left undeveloped as the world reduces its hydrocarbon consumption in order to avoid the risks of climate change. The question is whether investors and companies should be worried by that concept.

Nick Butler SEPTEMBER 28 2015
• Current energy shock is gas driven. This has near-term implications.
• The stubborn resilience of gas. Why it is unlikely to go away.
• For the medium term, gas market tightness is likely here to stay.
• Initial ‘no-regrets’ & early lessons for energy transition policies.
Current energy shock is gas driven, with near-term implications
The gas price surge can be split into three distinct phases. In the latest phase, price developments were first affected by the extreme near-term uncertainty, very recently also by scarcity risk.

Source: ACER based on ICIS Heren’s price data
Storages filled at ~50%, roughly on track to meet the target of 80% by 1 November 2022. However, uncertainty as to continued gas delivery from Russia is increasing. Storage remains key for winter resilience.

Source: ACER based on GIE data (excluding Ukrainian and Serbian sites).
Gas often drives electricity prices

Electricity price development in Germany and breakdown of the costs of producing electricity from gas (May 2021 - April 2022) - (EUR/MWh)

Source: ACER based on ICIS Heren
Beyond pricing, electricity adequacy may be affected

Historical gas consumption for electricity (AGC(e)) compared to the critical gas volume required (CGV) to meet demand

- Significant gas volume is needed for electricity adequacy
- By pushing gas to the end of the merit order, some gas demand could be saved while still covering the demand for electricity generation

Source: ENTSO-E, Gas dependency and preparation for winter 2022-23 (ENTSO-E’s Summer Outlook, June 2022)
The stubborn resilience of gas: Why it is unlikely to go away
Gas is a critical fuel in overall EU energy supply

Gross available energy by fuel
100% = 57,767 PJ

- Gas: 23.7%
- Oil & petroleum: 34.5%
- Renewable energy: 17.4%
- Nuclear: 12.7%
- Solid fossil fuel: 10.3%

Source: Eurostat (data is for 2020)
Even more so for seasonal flexibility needs

Comparing seasonal swings in electricity and natural gas demand in the EU from January 2017 to July 2021

Natural gas is a key provider of seasonal flexibility energy needs. Further electrification of heating, whilst reducing overall gas demand, may shift seasonal swings from the gas system to the electricity system, thereby significantly increasing seasonal flexibility needs in the electricity system.

Source: Eurostat data (from ACER's Final Assessment of the EU Wholesale Electricity Market Design, April 2022)
Geography matters: ‘East-to-West’ pipelines dominate

EU and Energy Community countries cross-border gas flows (2021, bcm/year)

The gas system has so far accommodated flows in response to price signals (greater volumes from East to West). New emphasis on West to East flows requires new investment.

Source: ACER calculation based on IEA and ENTSOG
Over the medium term, gas market tightness is likely here to stay
Current forward prices indicate price expectations

Evolution of gas (TTF) forward prices comparing the contractual outlook (October 2021 - June 2022)

Whilst Russia’s invasion of Ukraine led to high price spikes, these subsequently eased somewhat. Now, forward prices rise again due to reduced gas deliveries, in particular via Nord Stream 1.

Source: ACER calculation based on ICIS Heren
Future LNG needs for the EU are significant

RePowerEU targets to replace up to 50 bcm of Russian gas per year via extended procurement of LNG. This is more than 10% of EU 2021 gas demand and ~10% of global 2021 LNG trade.

Source: ACER based on European Commission
LNG capacity remains tight in the coming years

The EU will compete for extra volumes with Asia which will see growing demand, partly for overall economic growth, partly for lowering coal usage.

Source: IEA Gas Quarterly Report Q2 2022
So cyclically, new investments will be coming - right?

**Estimated change in upstream oil and gas spending by selected company types (2019-2022E)**

Upstream oil and gas investment is changing, with only the spending by Middle East national energy companies above pre-pandemic levels. This raises the question whether past ‘cyclical dynamics’ still apply.

*Source: IEA’s World Energy Investment Report, June 2022*
Current Russian gas supply cannot just ‘go elsewhere’

Russia expected to prioritise new export capacity, in particular towards China. This will involve significant investment and price concessions. Volumes are highly unlikely to make up for current EU + UK exports.

Source: Eurostat Energy database; Centre for Strategic and International Studies (May, 2022); IEA: Energy Fact Sheet: Why does Russian oil and gas matter?
On top, Russian long-term contracts hold resilience

Evolution of the nominal capacity of pipeline long-term supply contracts prevailing in the EU and expiration calendar – bcm/year

- From now until 2025 Russian long-term contract volumes remain relatively unchanged at ~100 BCM
- By 2029 they gradually dip below 90 BCM
- By 2032 they go to 64 BCM
- By 2036 they go to below 10 BCM

EU intends to end reliance on Russian gas in 2027

Russian long-term contracts towards EU markets last significantly beyond 2027. This adds complexity to current considerations.

Source: ACER calculation based on Cedigaz and NRAs
Turning to ‘no-regrets’
Aggressive demand reductions will be necessary

REPowerEU gas demand savings; what is being targeted
100% = 59 BCM

Example: buildings energy consumption

- Buildings represent 40% of energy consumption
- 75% of buildings are energy inefficient
- Only ~1% of building stock renovated yearly, getting to 1.7% a year would save an extra 1 BCM/year
- More investment and support needed to speed up renovations

Targeting demand-side measures is key. Price signals are not ‘the full story’ (current incentives being a case in point). Institutional and behavioural barriers persist. In addition, some interventions have long lead times.

Source: European Commission COM/2022/230 final; IEA A 10-Point Plan to Reduce the European Union’s Reliance on Russian Natural Gas
Evolution of the EU generation mix, 2020-2030 (TWh)

- Nuclear energy
- Coal
- Gas
- Other fossil fuels
- Renewables

Barriers exist, related more to permitting and lack of facilitating infrastructure (grids) than to capital availability.

Source: ACER based on European Commission data in the context of the Fit-for-55 Package. For 2030 the European Commission’s MIX scenario was used.
Though here, supply chain challenges loom

Costs for renewable generation are going up due to a mix of supply chain constraints and higher cost of materials, thereby reversing a previous downward trend.

Source: IEA’s World Energy Investment Report, June 2022
Early lessons for energy transition policies up ahead
It’s the supply. No, it’s the demand. No, it’s the …
One-sided focus on the supply-side holds risks

Oil prices rise in a net zero emissions scenario driven by supply policies vs. decline when driven by demand policies (US dollars a barrel)

Counterfactuals for oil and gas capital expenditure

Focusing on supply-side restrictive measures as opposed to (also) focusing on demand-side measures may bring strong upward pressure on prices. Also, targets do not constitute results. Recent history holds lessons.

Source: IMF World Economic Outlook, April 2022
In 2021, EU electricity cross-border trade delivered an estimated EUR 34 billion of benefits. Keeping market functioning and thus efficient electricity trade in place seems key. Attention may turn towards redistribution-oriented measures, targeting perceived excessive producer rents for the benefit of consumers.

Source: ACER based on NEMOs and TSOs simulations (ACER's Final Assessment of the EU Wholesale Electricity Market Design, April 2022)
"... whilst increased energy independence vis-à-vis (particular) third-countries is a policy objective of growing importance, realising this may well depend on enhanced energy inter-dependence amongst EU Member States."

Further strengthening a ‘shared resources’ model across the EU requires investment; in infrastructure, rules, institutions and governance. Importantly, it also requires political investment in the ‘comfort levels’ of being more (inter-)dependent on other Member States for one’s energy needs.

Source: ACER's Final Assessment of the EU Wholesale Electricity Market Design, April 2022
Thank you.
Looking forward to the discussion.
Back-up slides
• Supporting the integration of energy markets in the EU (by common rules at EU level). Primarily directed towards transmission system operators and power exchanges.

• Contributing to efficient trans-European energy infrastructure, ensuring alignment with EU priorities.

• Monitoring the well-functioning and transparency of energy markets, deterring market manipulation and abusive behaviour.

• Where necessary, coordinating cross-national regulatory action.

• Governance: Regulatory oversight is shared with national regulators. Decision-making within ACER is collaborative and joint (formal decisions requiring 2/3 majority of national regulators). Decentralised enforcement at national level.
Energy dependence on Russia is significant

Share of Russian physical gas and oil in total supply of individual MSs – 2021 - % ranges

Source: ACER based on Eurostat data.
US LNG coming to the rescue; will it suffice?

While LNG supply is rising significantly (+70% in Q1 2022), mostly coming from the US, it will be a challenge to meet the targeted two thirds reduction of Russian supply.
Rising energy costs in industry lead to demand cuts

For some process industry players, rising energy prices have increased production costs by almost 50 percent.

Industry is likely to be further encouraged or forced to increase efficiency oriented investments.

Source: Left graph McKinsey & Company, right graph Eurostat Energy database