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Energy aspects

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Global Economic Prospects: Spring 2022

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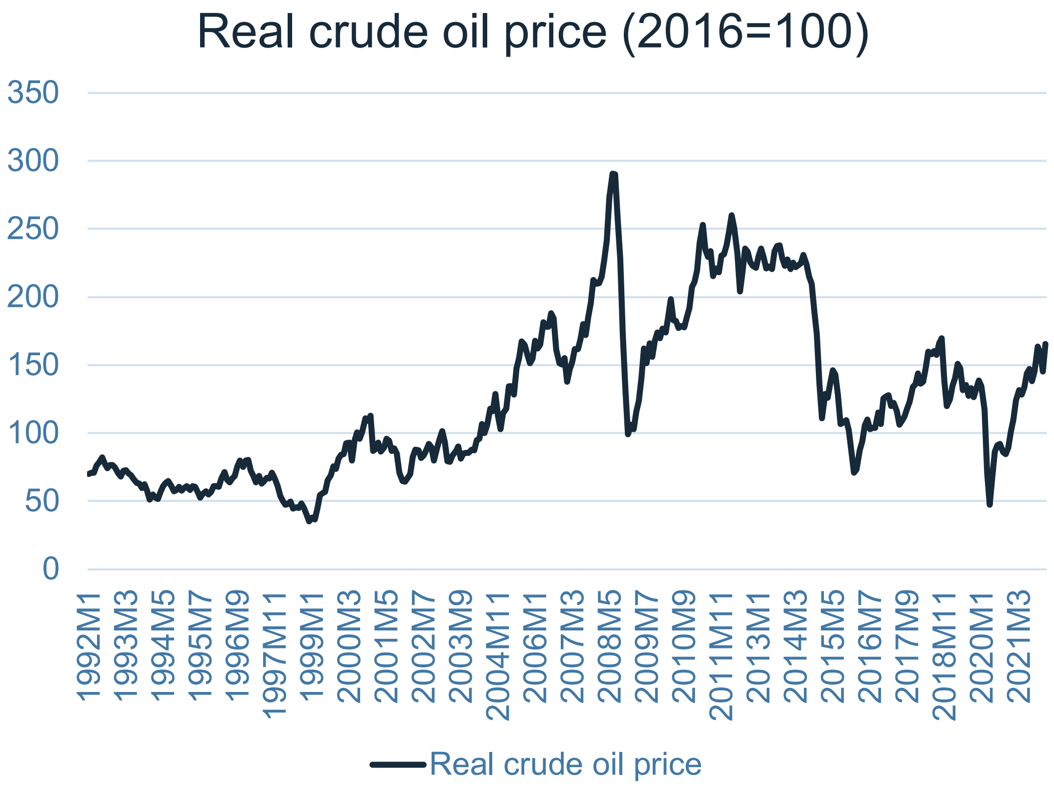
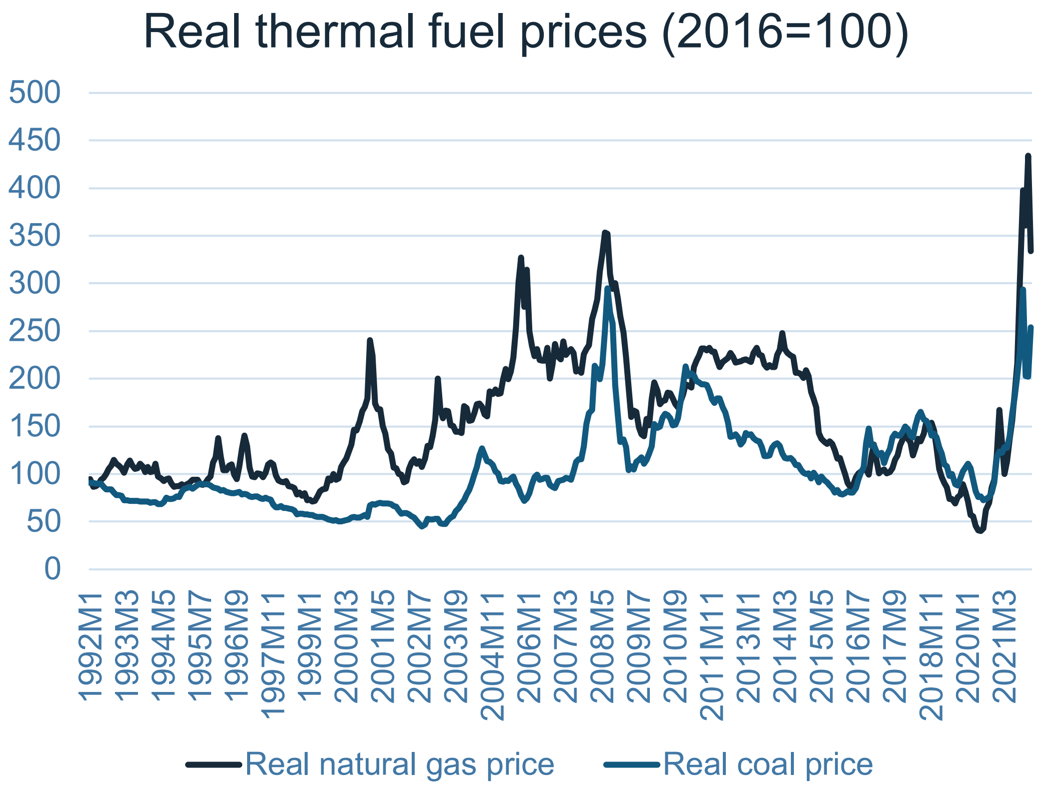
Key energy aspects to the global outlook

1. Tight global energy markets just prior to the Russian invasion of Ukraine
2. Energy market dislocations amid the war and Russia-Europe energy bind
3. War-related energy market inevitabilities
4. Short- to medium-term implications for global economic prospects

Pre-war

Tight energy markets to start 2022 …



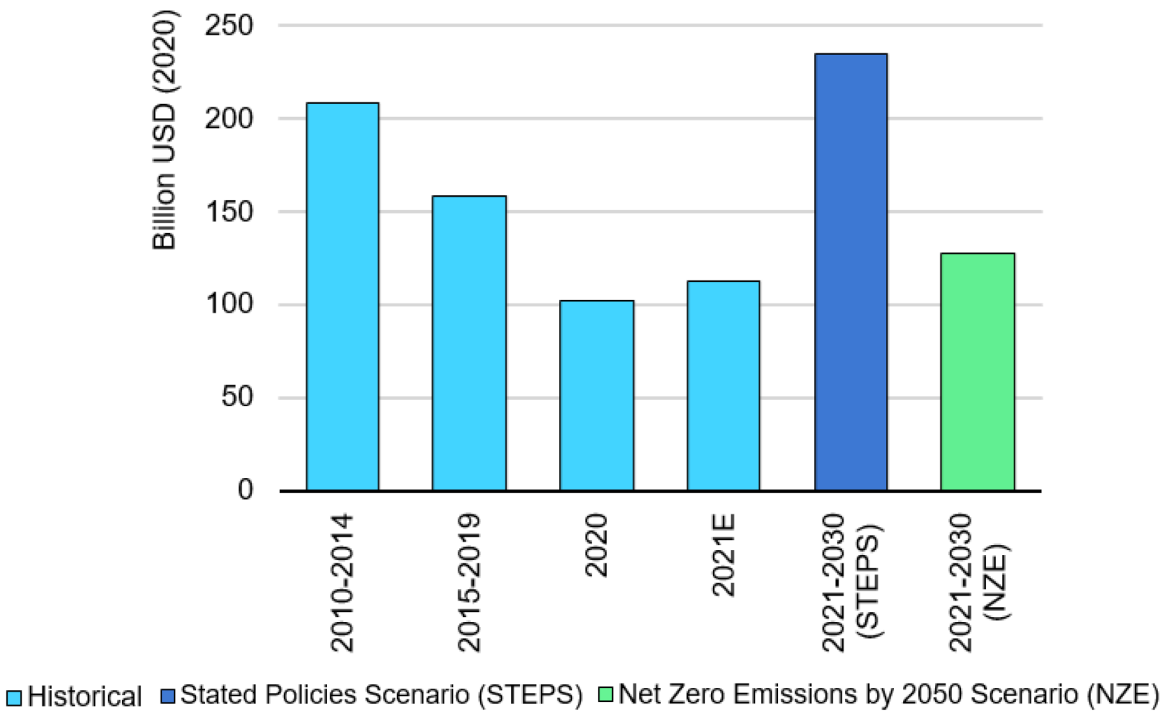


Sources: IMF, Commodity Price System, and Federal Reserve Bank of St. Louis, FRED

… especially for natural gas

- Record hub prices in Europe and Asia ($20-30/mmbtu)
- North American Henry-Hub price doubles ($4-5/mmbtu)
- Strong economic rebounds and cold winters in 2020–21
- Unplanned outages and under-investment

Annual investment in upstream natural gas supply



Source: IEA, Gas Market Report, Q1-2022

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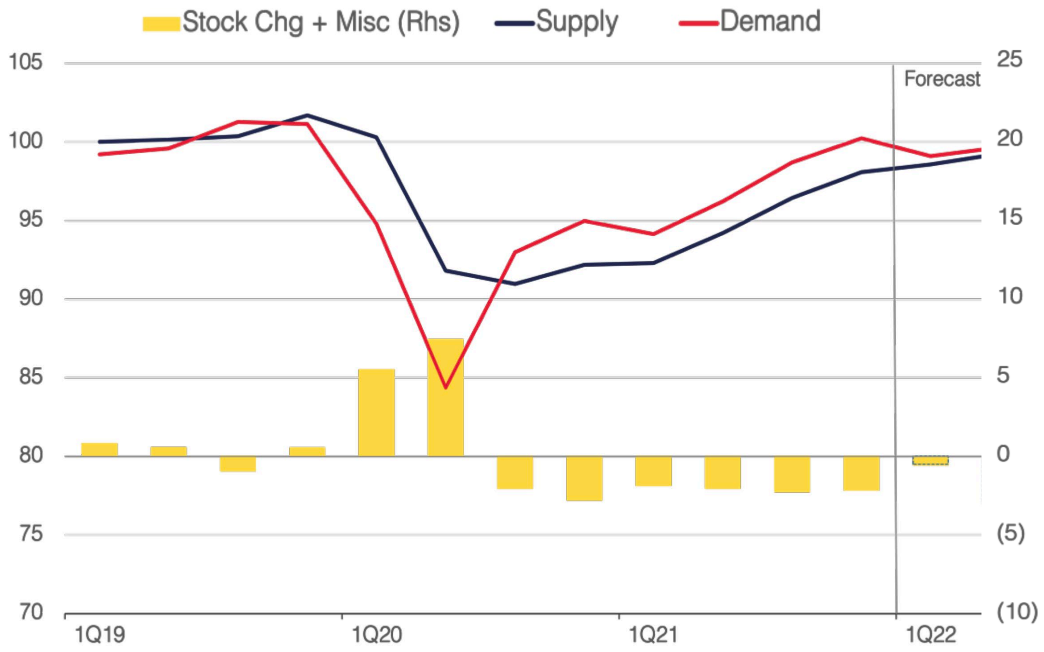
Tight oil market amid OPEC+ supply curbs

- ❑ **OPEC+ production cuts**
  - ❑ 9.7mb/d in May 2020
  - ❑ 5.8mb/d July 2021
  - ❑ 0.4mb/d monthly taper
- ❑ **Some OPEC shortfalls**
  - ❑ Angola, Nigeria (0.5mb/d)
- ❑ **Steady non-OPEC recovery**
- ❑ **OECD stocks below Q4 2019**

Global oil market balance (mb/d)

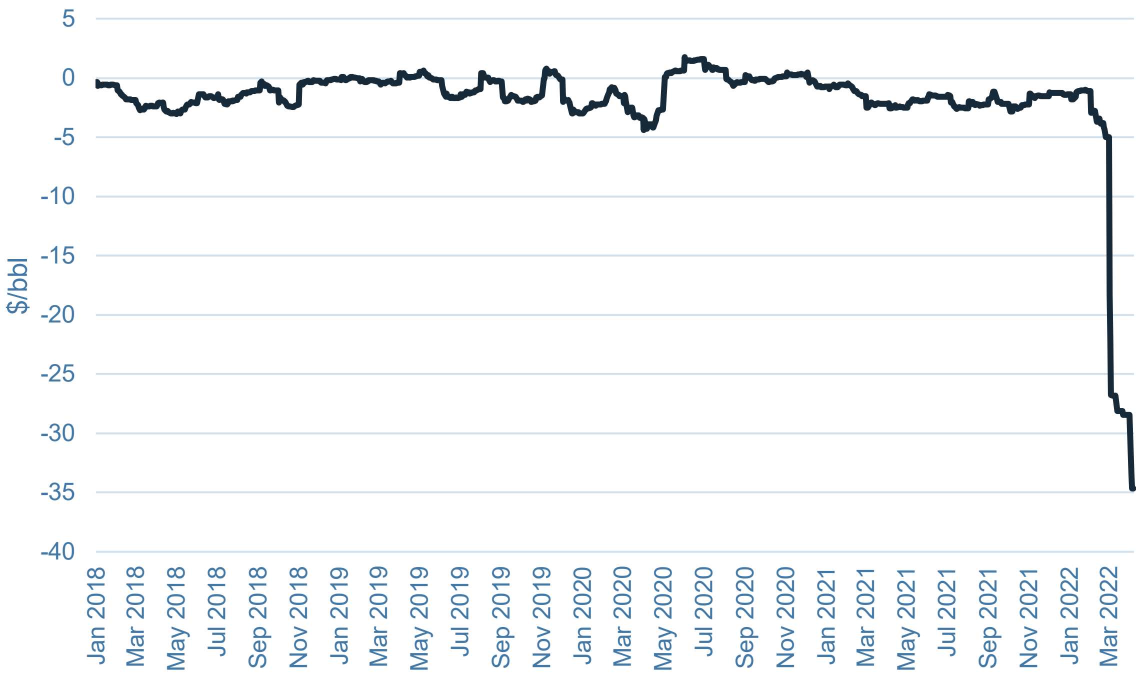


Source: Oxford Institute for Energy Studies, OIES Oil Market Monthly, March 2022

Heavy sanctions on heels of Russian attack

- ❑ **Maximize economic costs to Russia; minimize costs to West**
- ❑ **Sweeping financial sanctions / tech export bans / asset freezes**
- ❑ **But energy largely excluded**
  - ❑ Energy 40% of RU gov't revenue
  - ❑ 80% of which from oil
- ❑ **Russian seaborne oil shunned**

Urals Rotterdam vs dated Brent oil price



Source: ICE via Macrobond.

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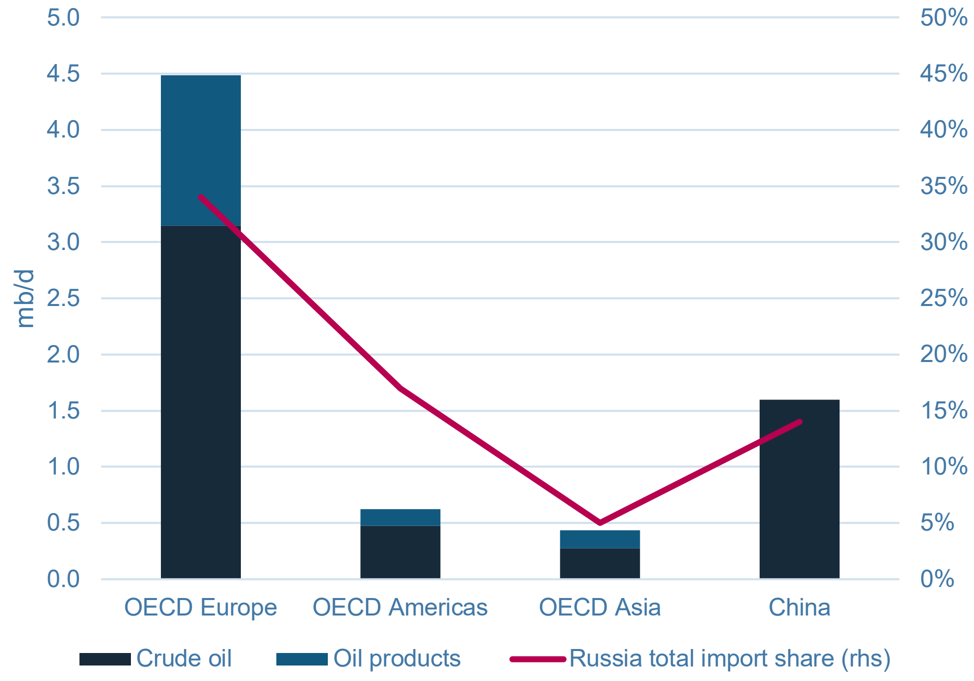
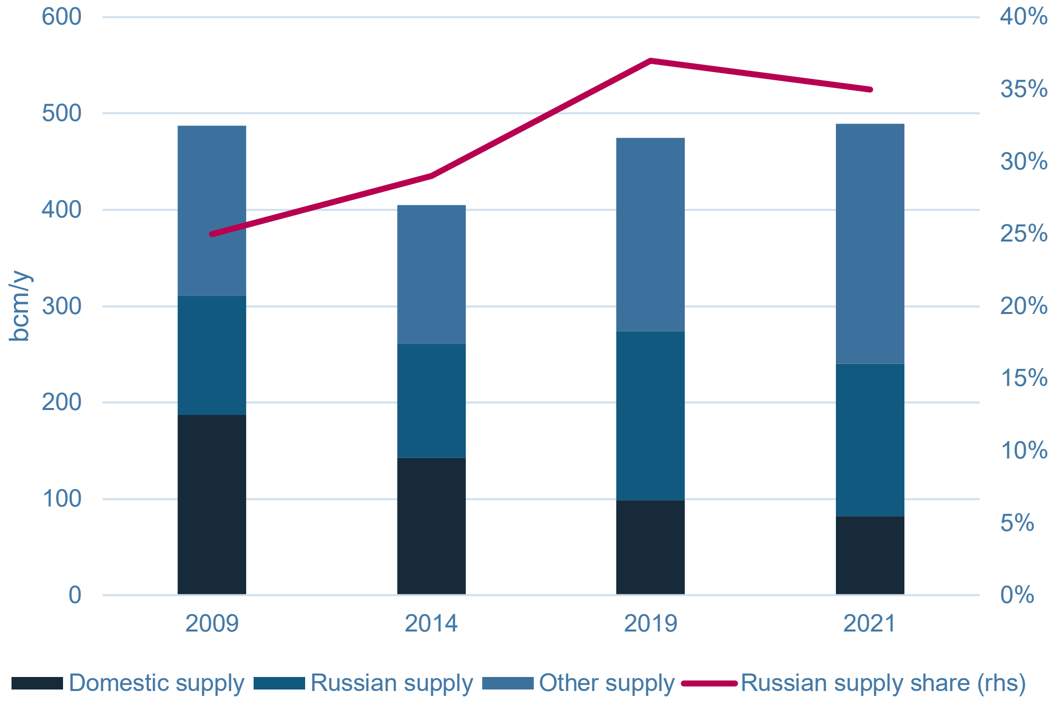
Russia-Europe energy bind

Russian oil imports and import share
(November 2021)



Russian share of EU/UK natural gas

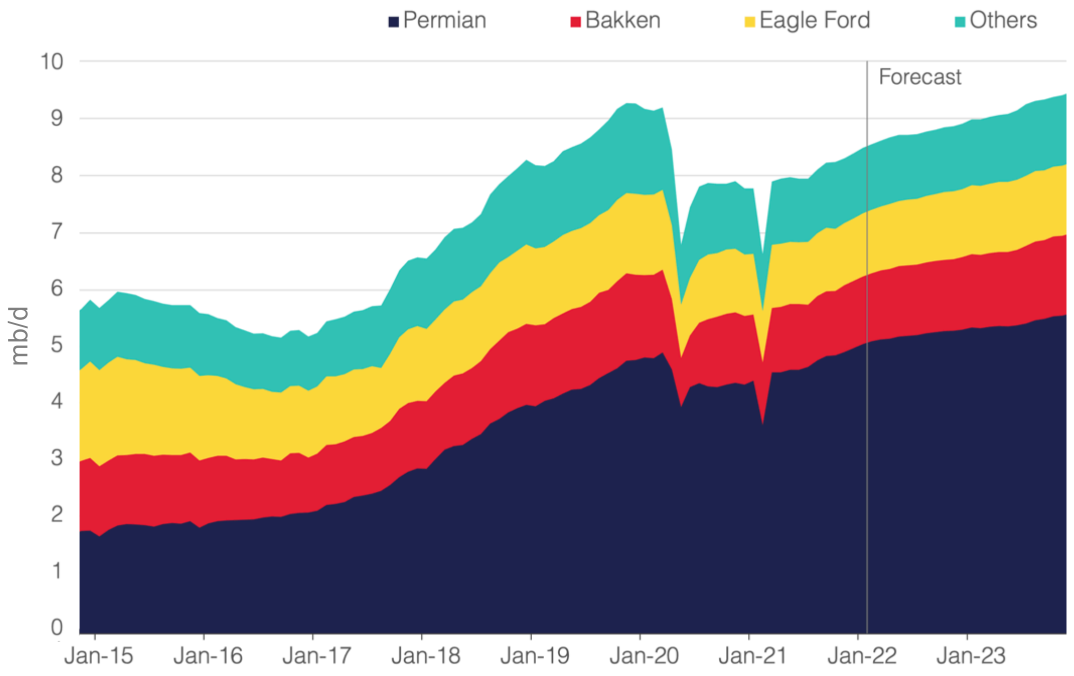


Source: IEA, Russian Supplies to Global Energy Markets, February 2022

Oil 'fungible' and search for more supply

- ❑ **Asymmetric vulnerabilities**
  - ❑ Russia oil / EU natural gas
- ❑ **Overtures to OPEC rebuffed**
  - ❑ Saudi-Russian cooperation on oil
  - ❑ Regional security – Iran, Yemen
- ❑ **Revival of Iran nuclear deal**
  - ❑ IRGC sanctions
  - ❑ Russian agreement needed
- ❑ **Non-OPEC production**

US shale oil production growth



Source: Oxford Institute for Energy Studies, OIES Oil Market Monthly, March 2022

European shift from Russian energy

- **Russian natural gas to Europe**
  - ~150bcm/y total supply
  - 15bcm/y contracts end 2022
  - 40bcm/y contracts by 2030
- **Short-term options** (~40bcm/y)
  - Norway, Algeria and Azerbaijan via spare pipeline capacity
  - Groningen (temporary)
  - Diverted LNG cargoes
  - Lower thermostats
- **Medium-term low-carbon options**
  - Accelerate wind/solar PV (6bcm/y)
  - Biomass / nuclear (13bcm/y)
  - Efficiency / heat pumps (12bcm/y)
- **Larger EU call on global LNG**
  - 100 bcm/y supply growth to 2025
  - China largest off-taker
- **Coal replaces some Russian gas**

Sources: IEA, A 10-Point Plan to Reduce the European Union’s Reliance on Russian Natural Gas, March 2022, and Shell, Shell LNG Outlook 2022, February 2022.

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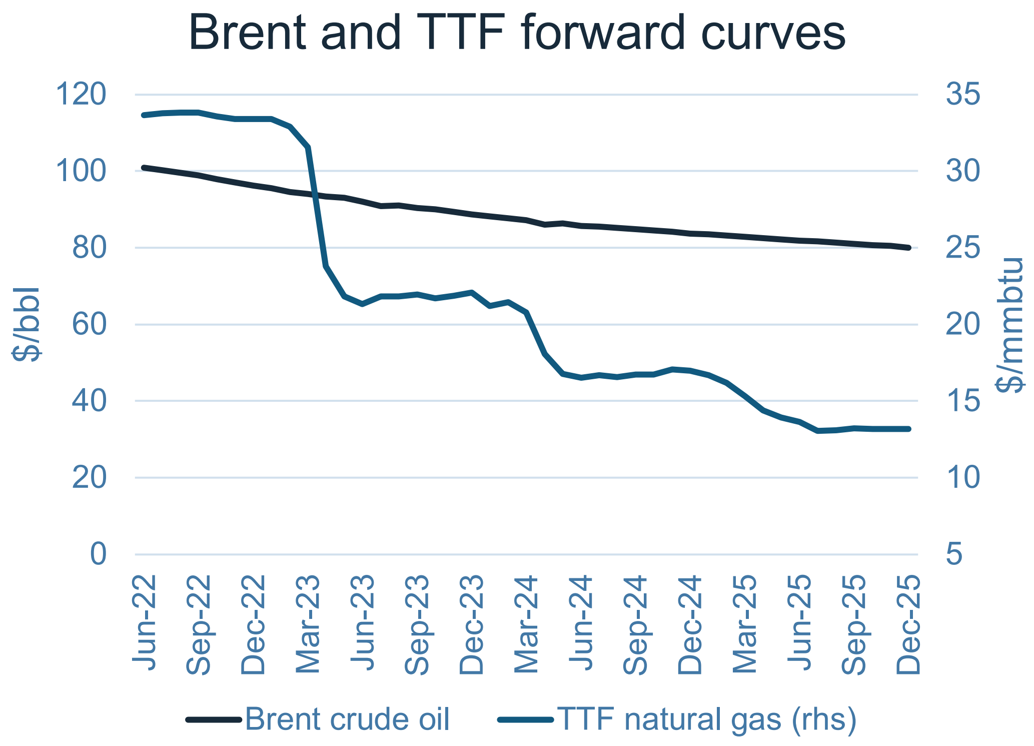
Key energy aspects to global prospects

1. **Energy / commodity shocks**
   a. 1-2%pt off global growth baseline

2. **Large European natural gas and electricity price shocks**
   a. Significant drag on EU/UK growth

3. **Faster low-carbon energy pivot**

4. **Moderate oil shock … so far**
   a. ST dislocations; high volatility

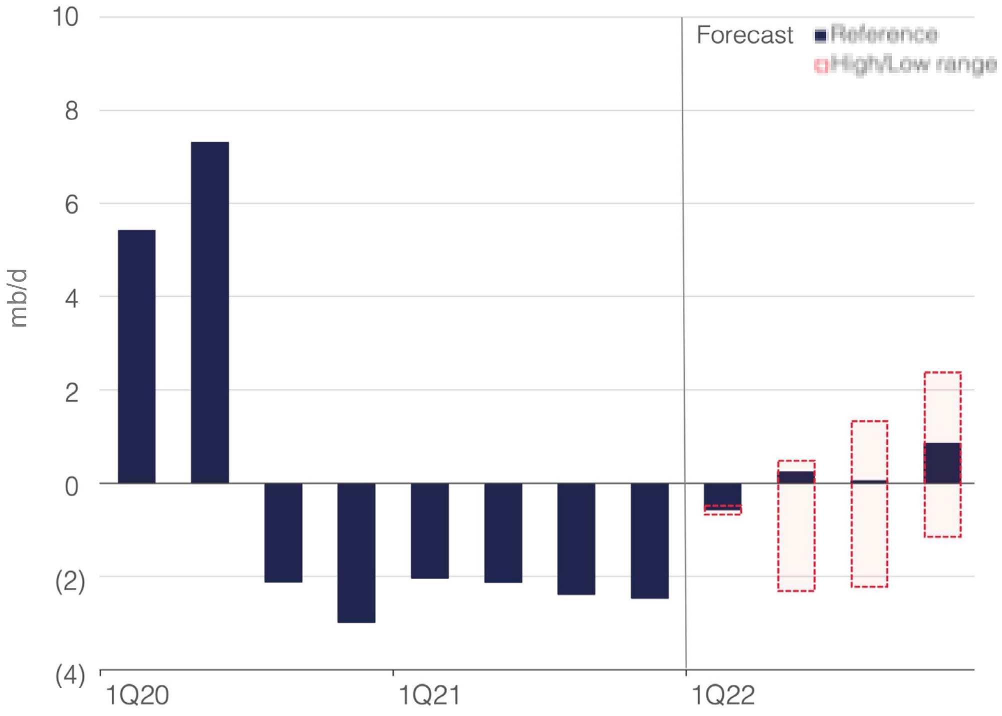


Source: ICE and CME, April 8, 2022

Key energy-related risks to global prospects

1. **Protracted war and Russian oil**
   a. Curtailment risk up to ~4mb/d
2. **Iran nuclear deal / market return**
   a. Phase in of +1mb/d
3. **OPEC quota phase outs**
   a. ~3mb/d v. 1.5mb/d potential
   b. SA/UAE spare capacity ~2mb/d
4. **Non-OPEC supply +1–2mb/d**
   a. US SPR release 1mb/d (6 months)

Risks to global oil market balance



Source: B. Fattouh and A. Economou, Russia's invasion of Ukraine and global oil market scenarios, OIES, April 2022

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