Market Report Series
Oil 2018

Spanish Energy Club, Madrid, 3 May 2018

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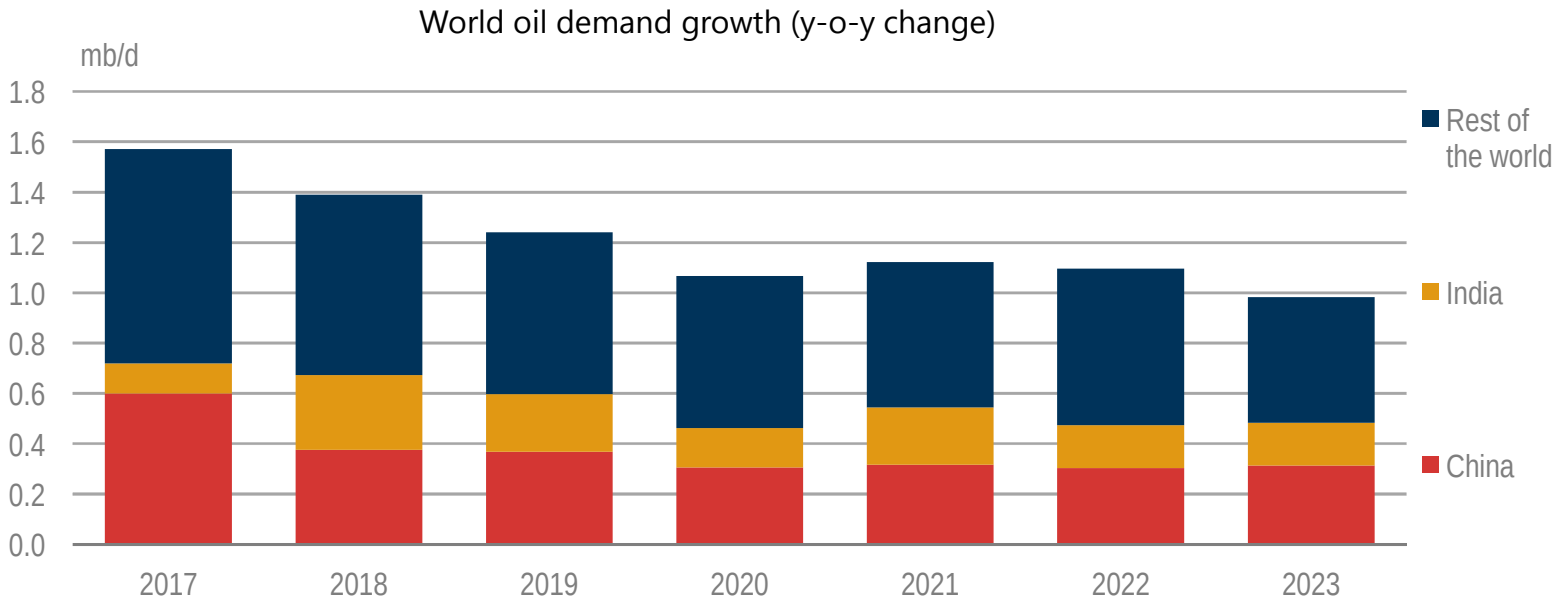
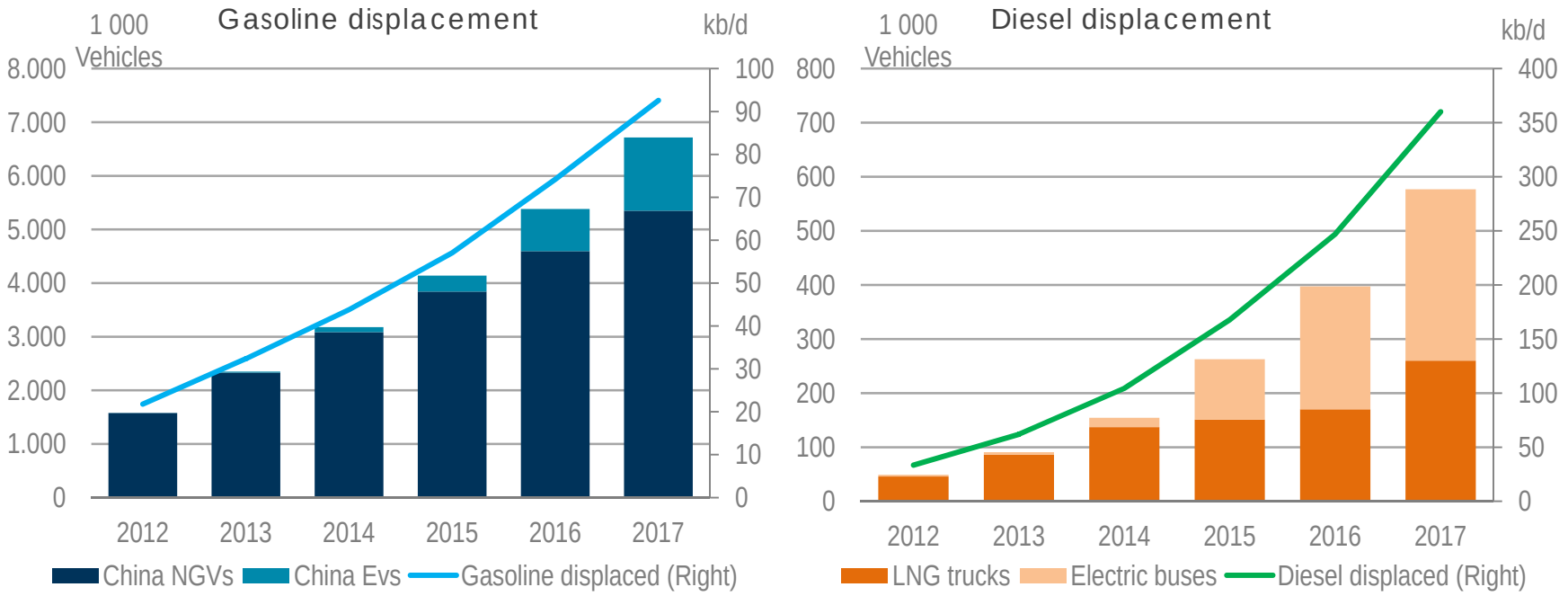
Robust global oil demand growth to 2023



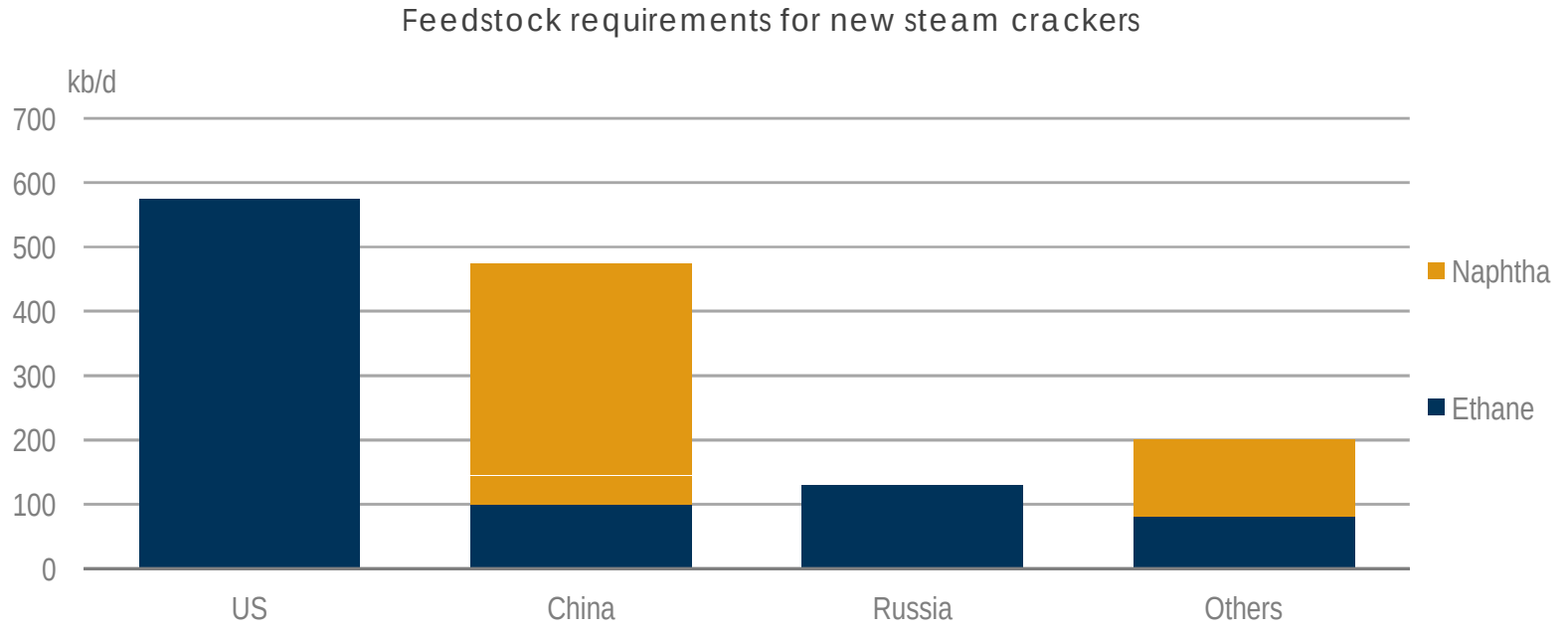
China and India account for almost half of world oil demand growth

China use of alternative fuels displacing oil



12 times less buses and trucks having 4 times more impact than Electric cars and NGVs

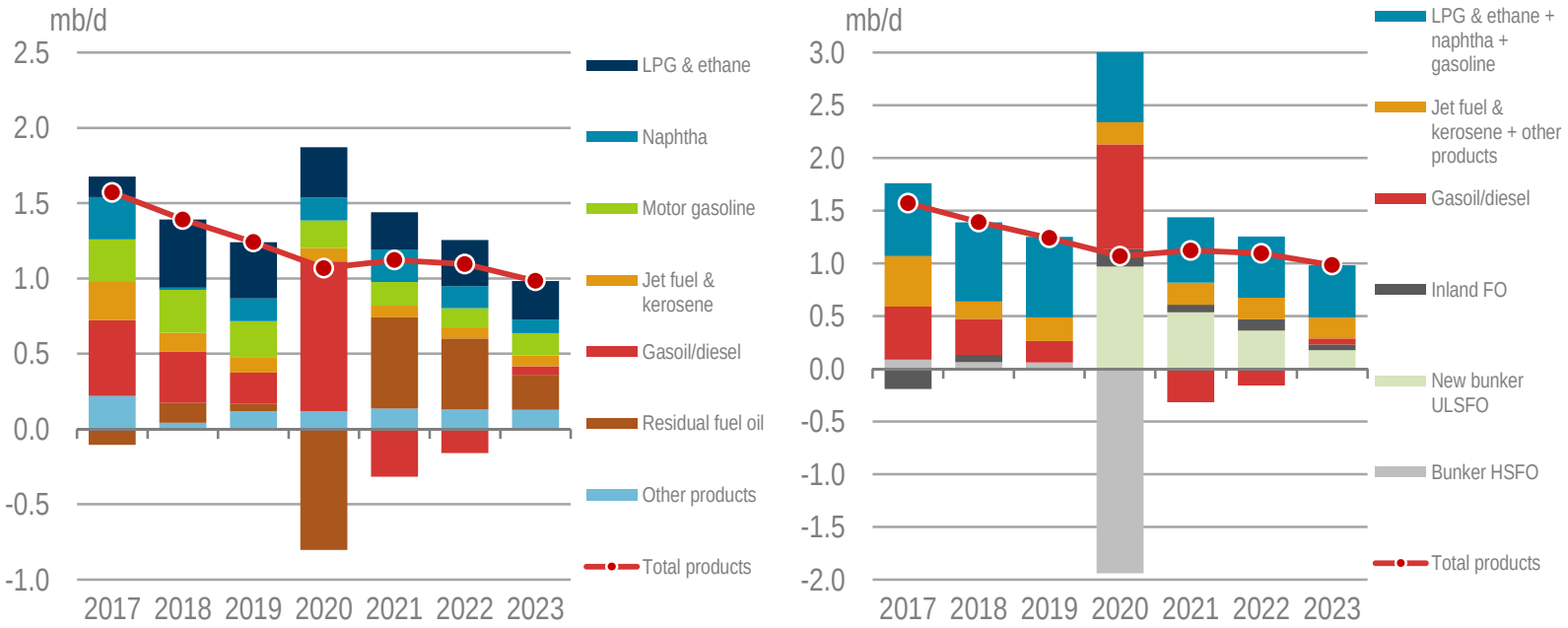
Petrochemicals drive global oil demand growth to 2023



Petrochemical feedstocks (ethane and naphtha) responsible for 25% of global oil demand growth

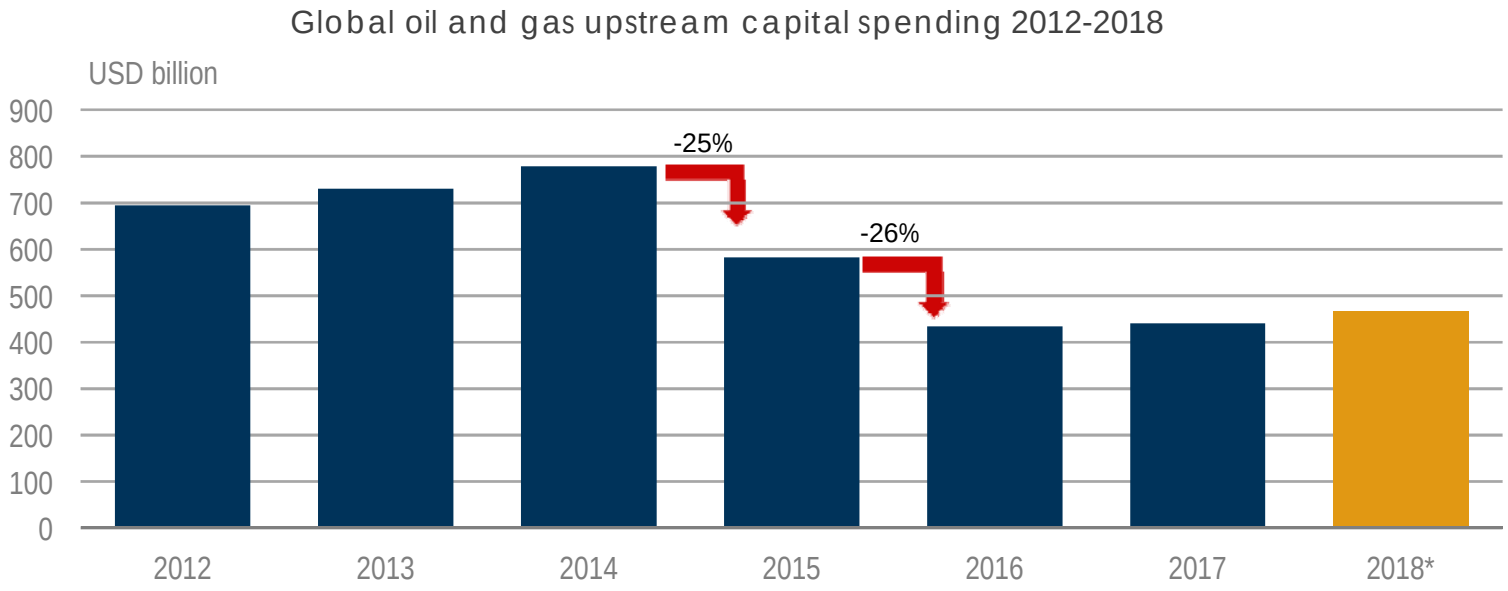
Oil demand growth by product

Oil demand growth by product – And fuel oil breakdown (y-o-y changes)



Very large shift in demand in 2020 and following adjustments reflect IMO induced switch

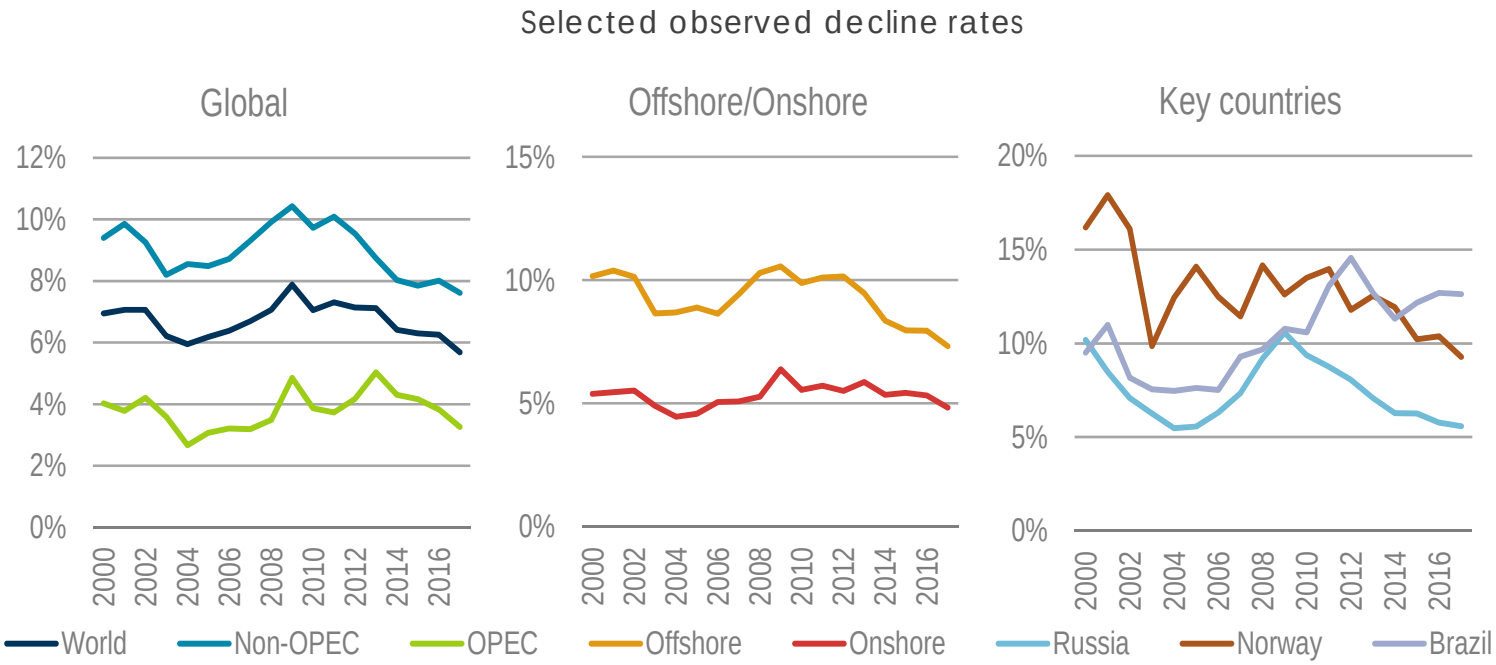
Only limited uptick in global upstream spending



*Preliminary based on selection of investment updates

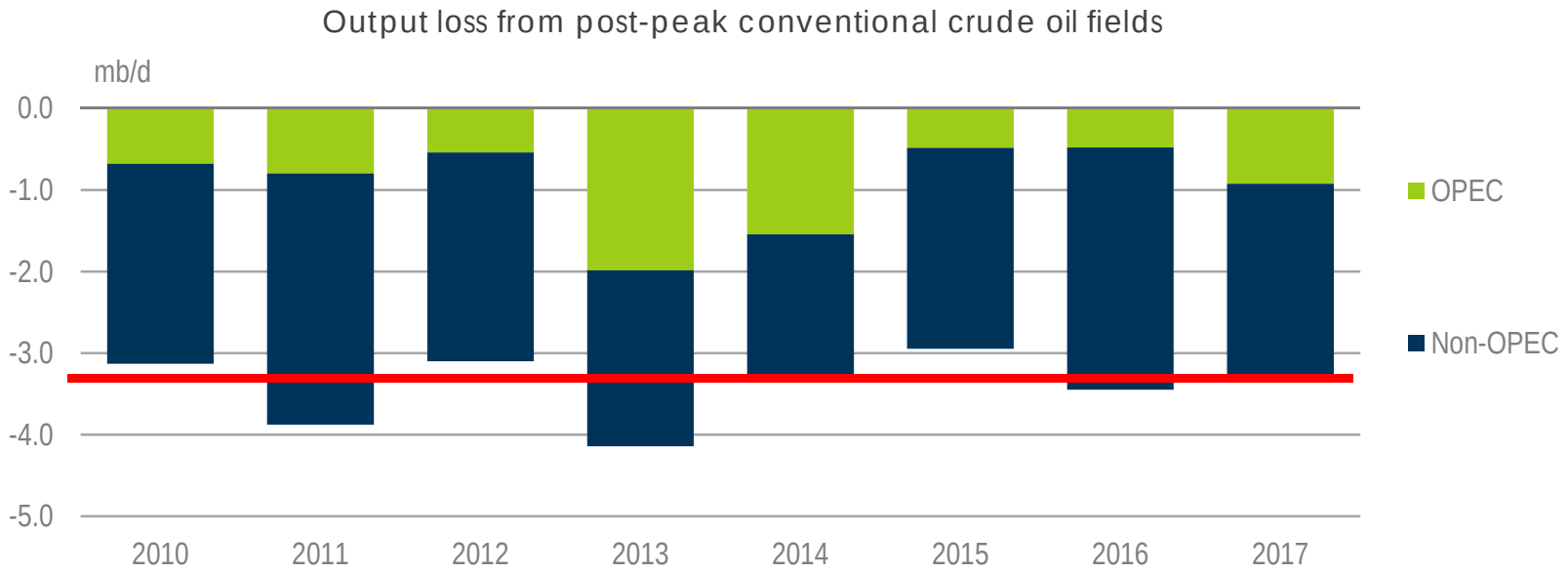
Producers spend more on short cycle supply, especially US LTO.
Investments in conventional fields remain depressed, but some signs of renewed interest in offshore.

With tight budgets, spending geared to short-cycle oil



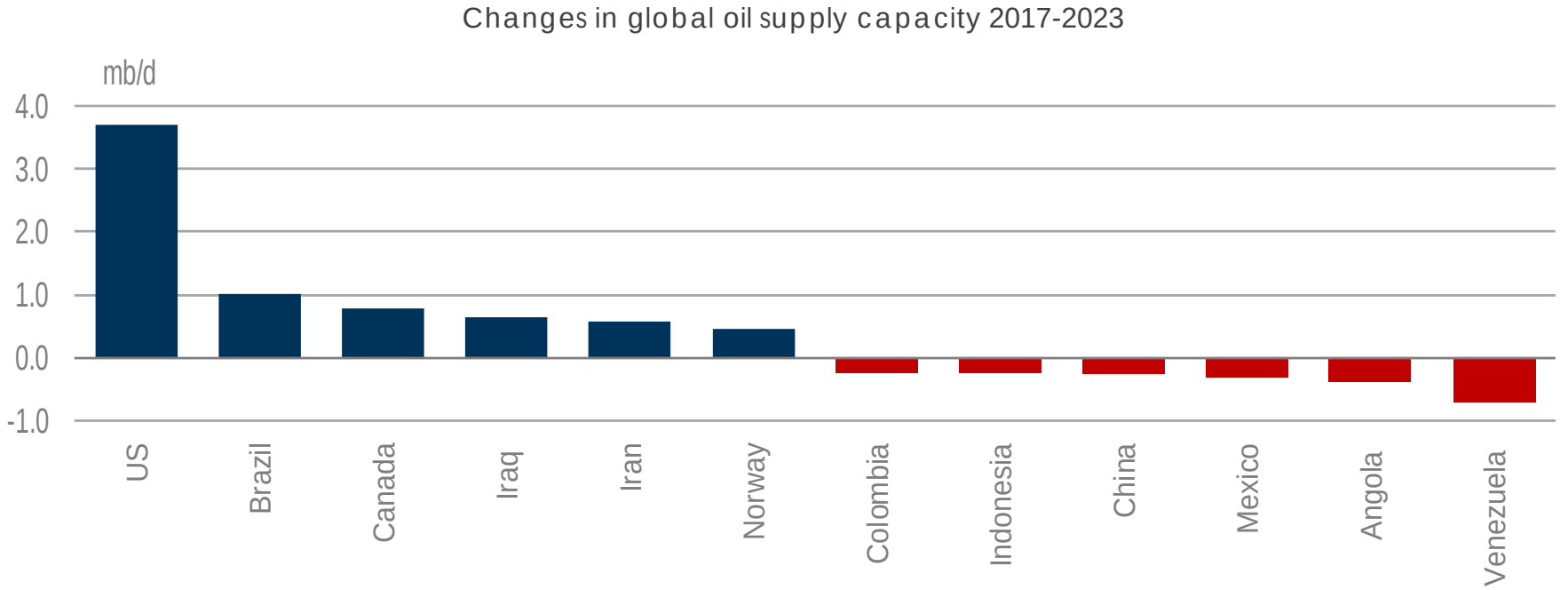
Modest capex/opex injections can in many cases bring rapid results in terms of output.

Oil industry needs to replace one North Sea each year



Ageing oil fields lose more than 3 mb/d per year despite slowing decline rates.

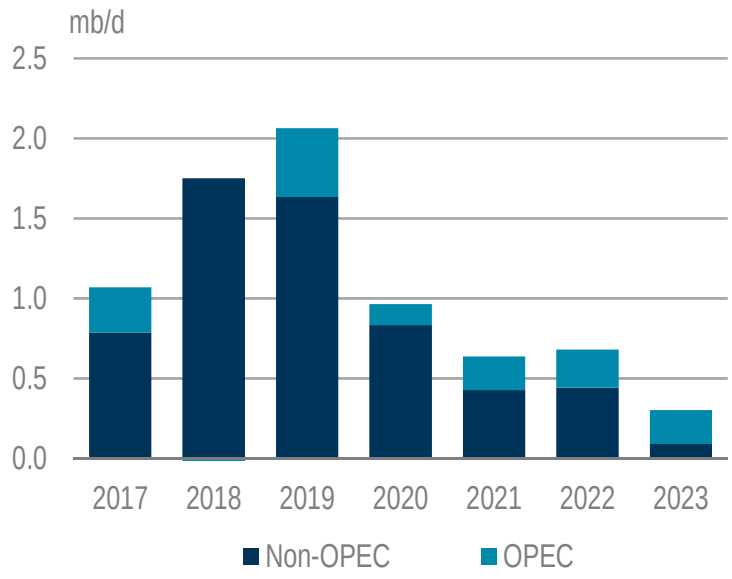
Booming non-OPEC supply growth reshapes world oil market…



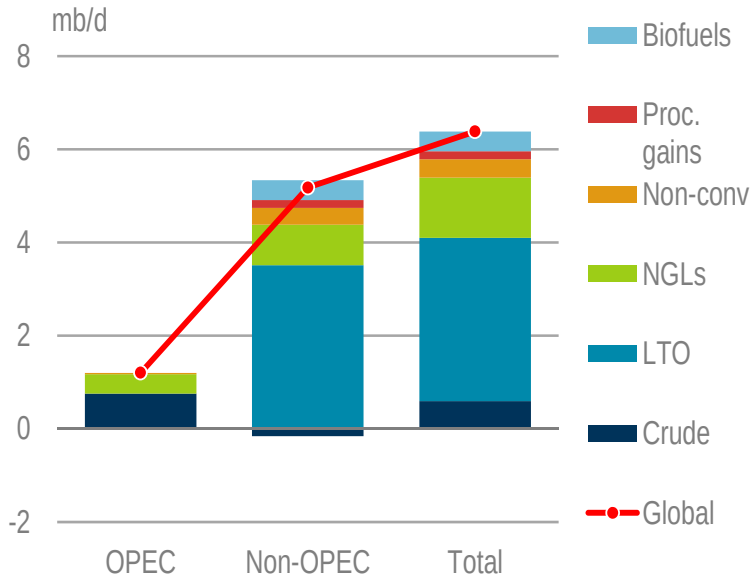
…more than covers demand growth for next three years. By 2023, non-OPEC supply grows by 5.2 mb/d. OPEC oil capacity rises only 1.2 mb/d due to Venezuelan collapse and limited increases elsewhere.

Supply growth front loaded & restricted to LTO, other supply

Global liquids capacity growth

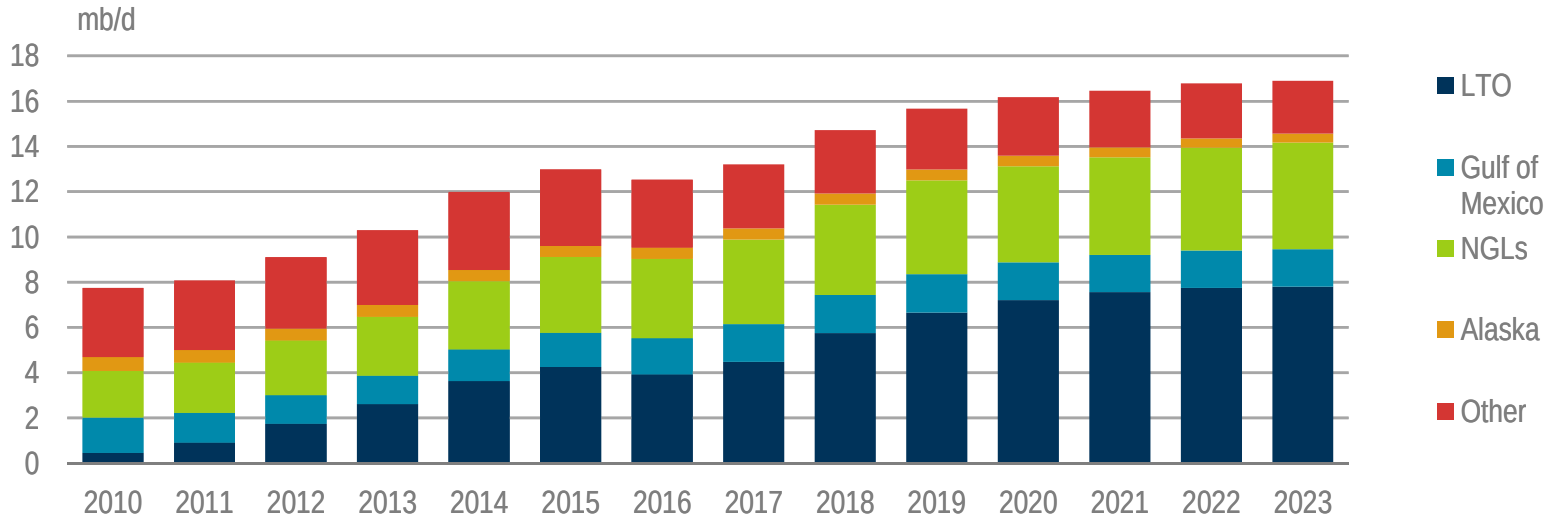


Global oil supply capacity growth 2017-23



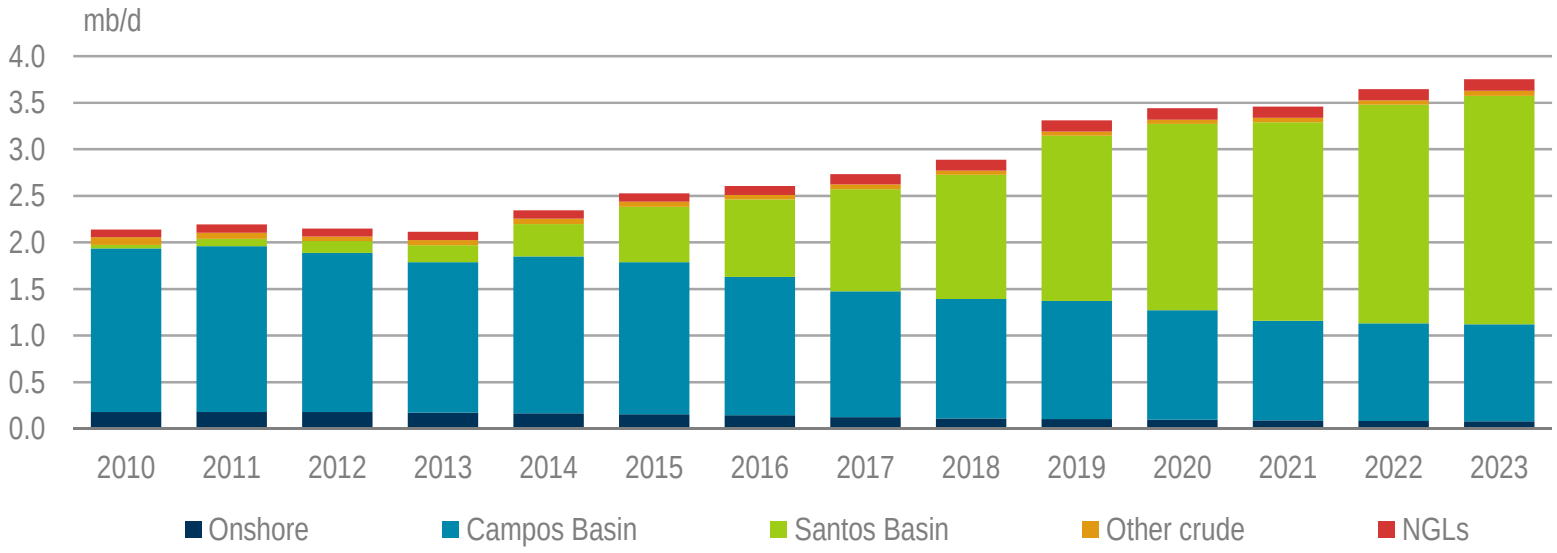
But will projects be brought forward? Projects sanctioned today tend to have shorter lead-time.

Higher oil prices unleash second wave of US supply



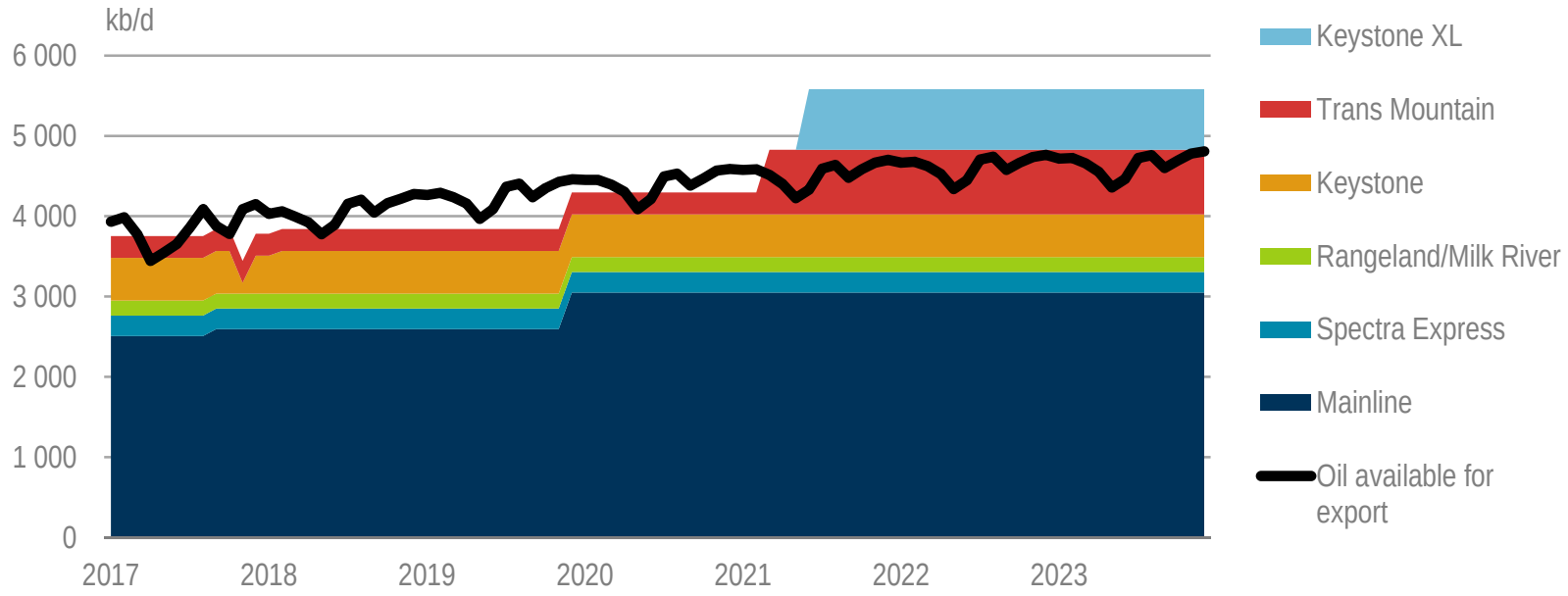
Total output reaches 17 mb/d by 2023 – and could be even higher if prices rise.

Brazil, second largest source of supply growth to 2023



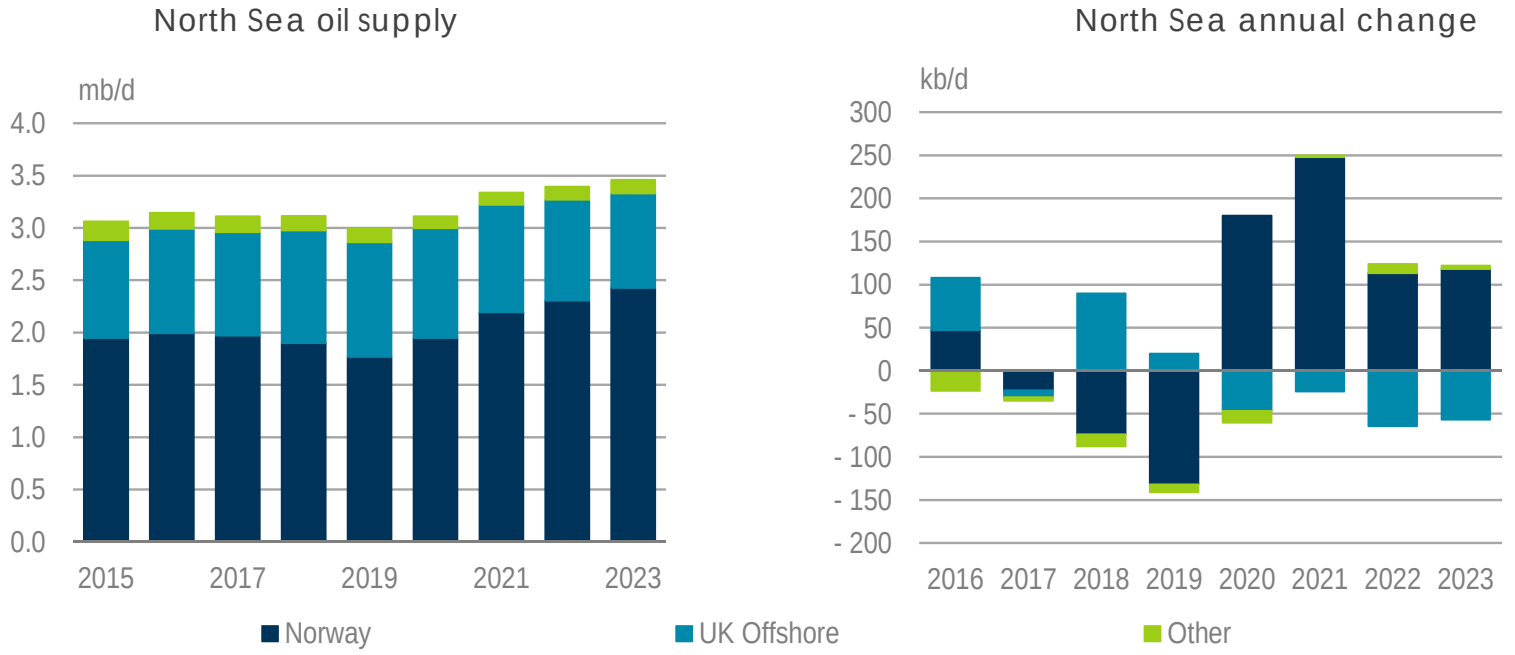
Pre-salt increase offset declines in the onshore and Campos basin. Output up 1 mb/d, to 3.75 mb/d.

Canadian oil pipelines stretched to the limit



Takeaway capacity to remain insufficient until 2021, forcing increase in rail exports.

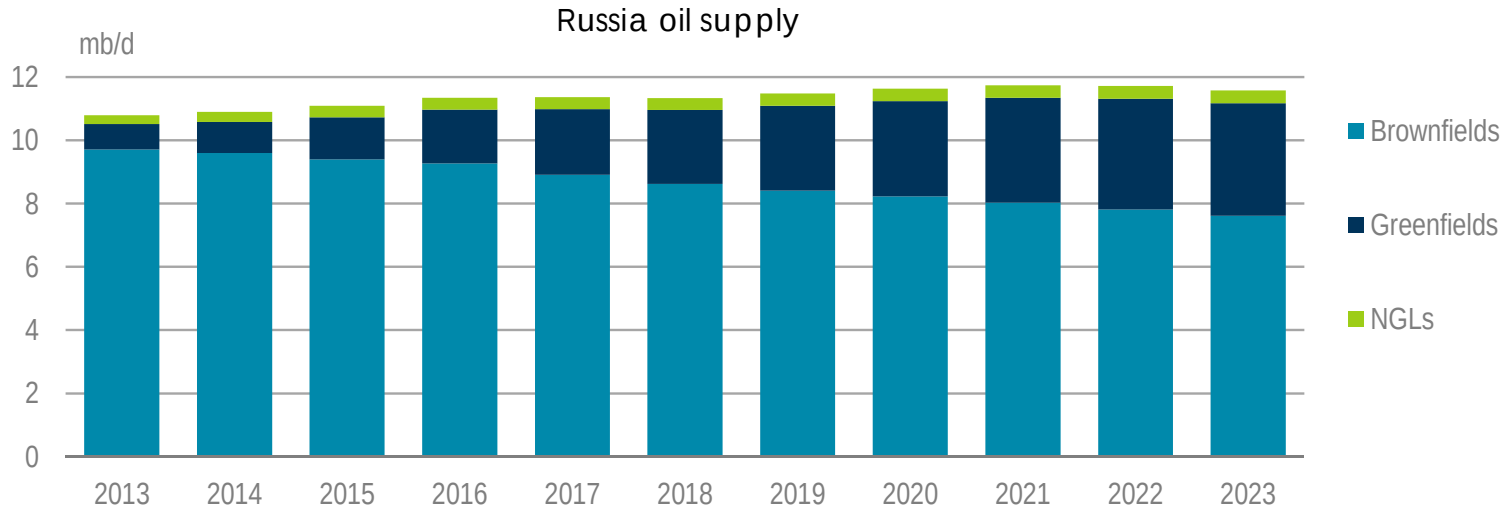
North Sea renaissance as development costs drop by half



Number of projects sanctioned over past few years will lift supply to highest since 2010.

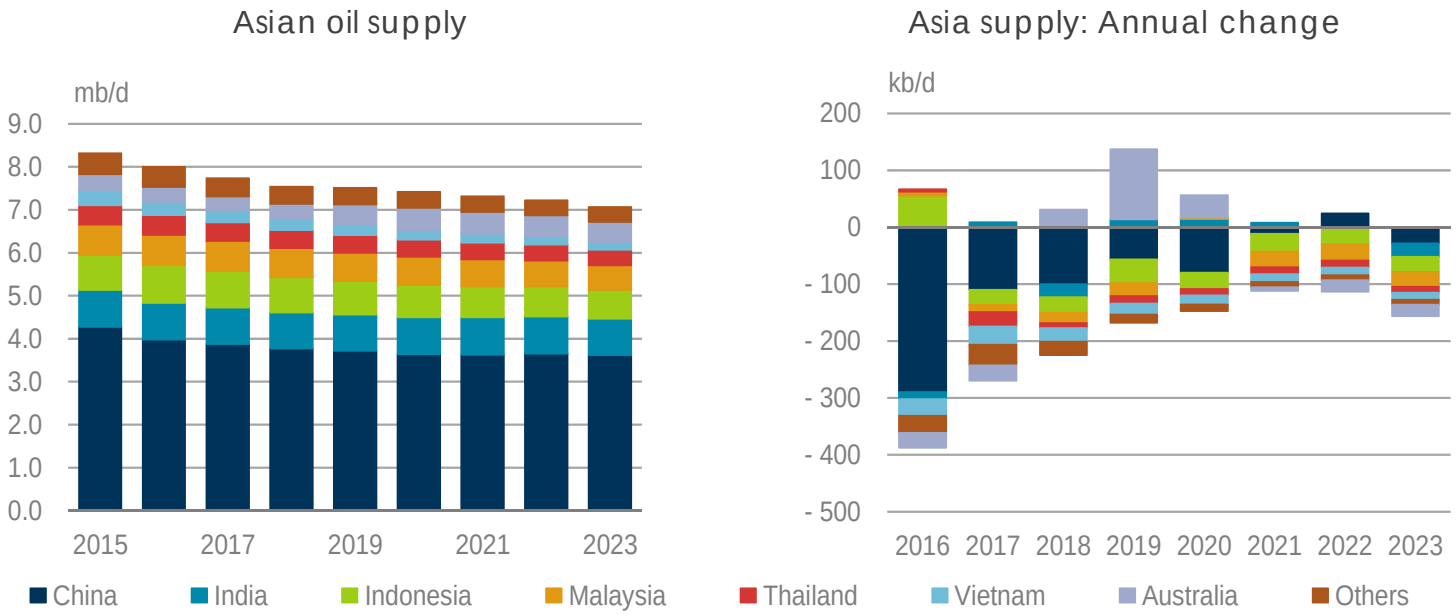
What's in store for Russia's oil production?

- **"Next generation" oil projects** (shale, Arctic, deep water) require considerable financial support and advanced technologies, face considerable sanctions risk
- **Domestic factors**: tax and sector reform, increased horizontal drilling, import substitution
- **Overseas factors**: diversification, hedging with overseas reserve replacement



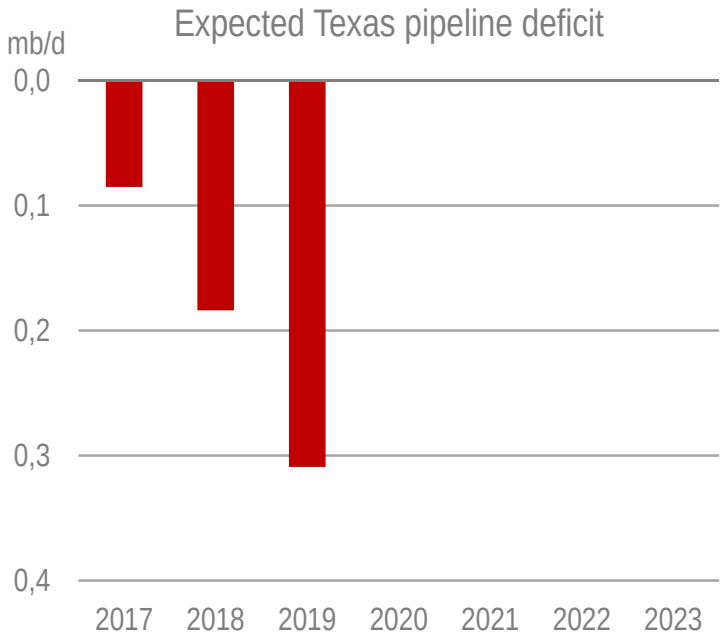
Source: IEA Market Report Series: Oil 2018

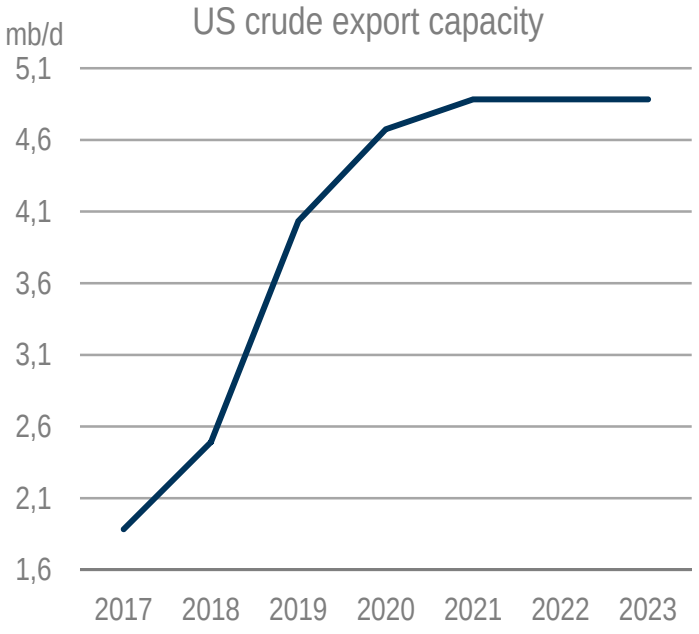
Asian oil supply downtrend continues



Declines ease as spending picks up modestly. Crude declines offset by CTL output in China.

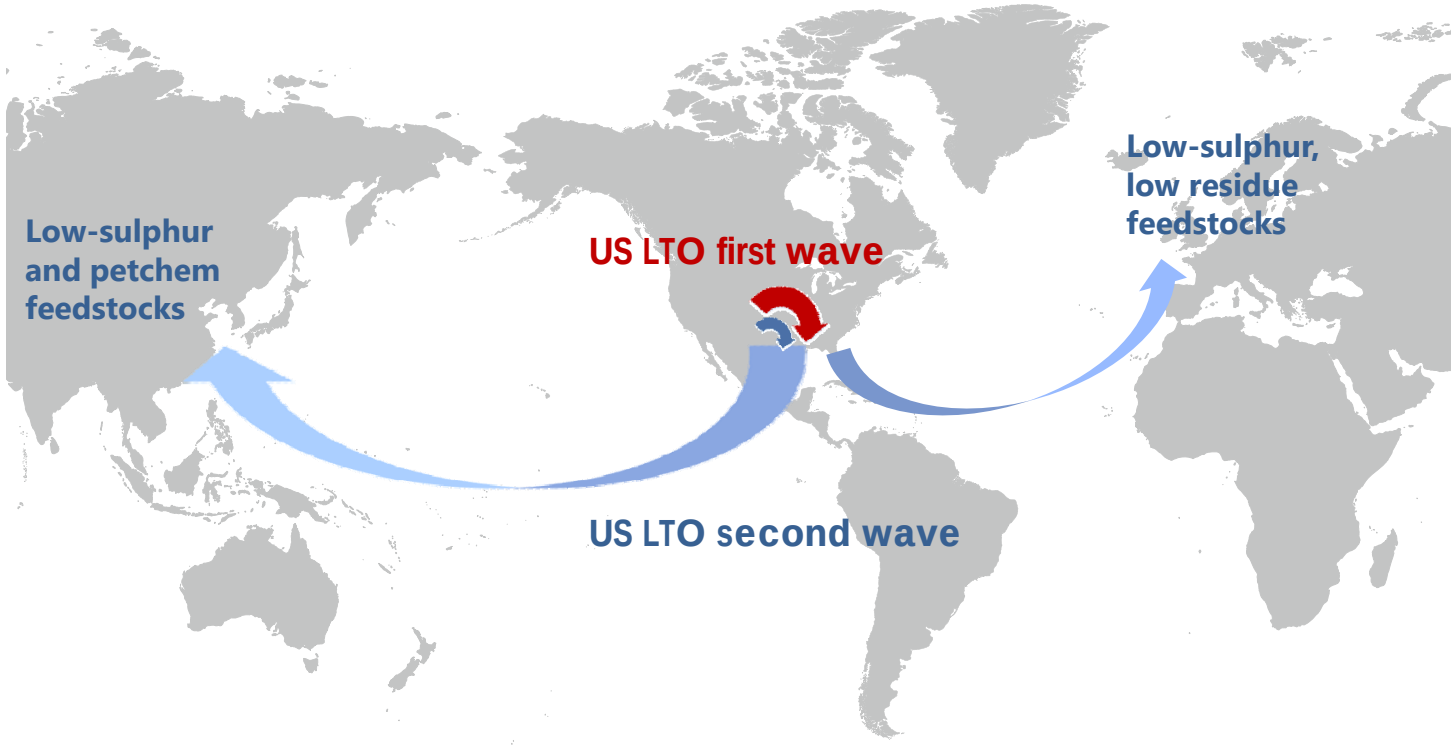
US pipeline bottlenecks ease, export capacity more than doubles





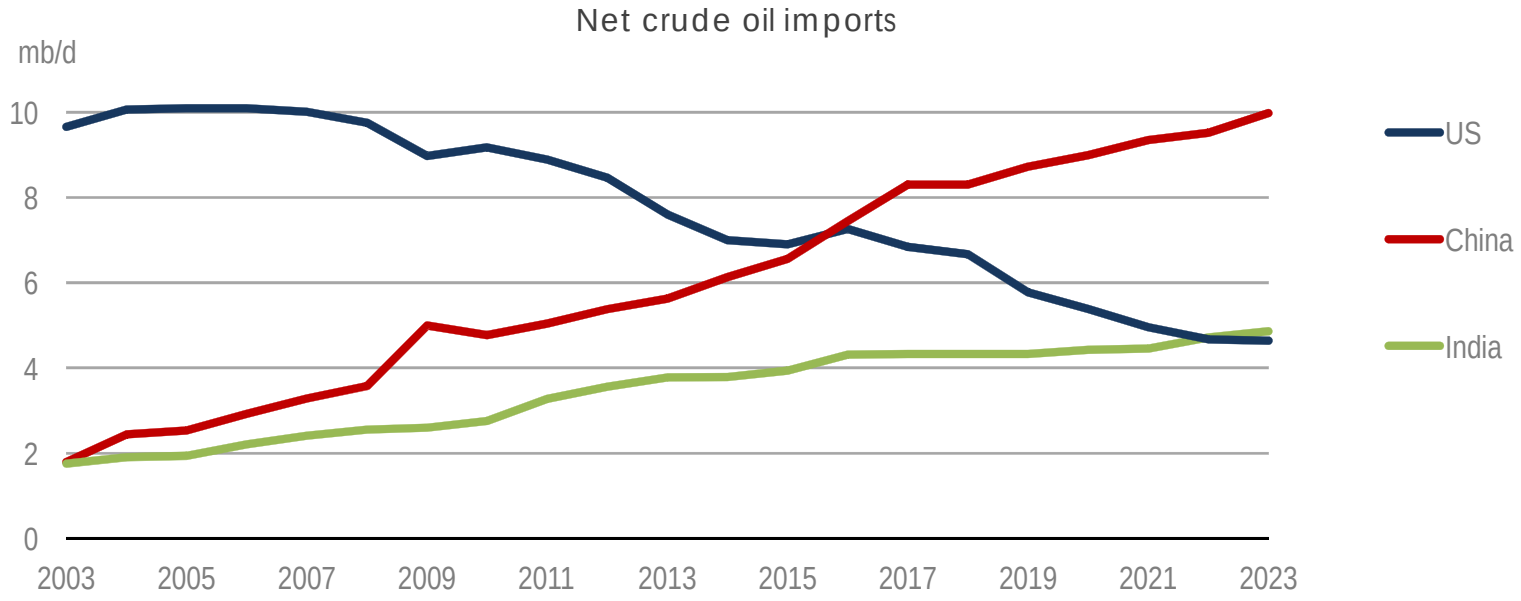
New pipeline projects (Permian Express, EPIC) ease constraints. US export capacity rises to 4.9 mb/d by 2023. Corpus Christi solidifies position as largest US export hub.

US oil finds new markets



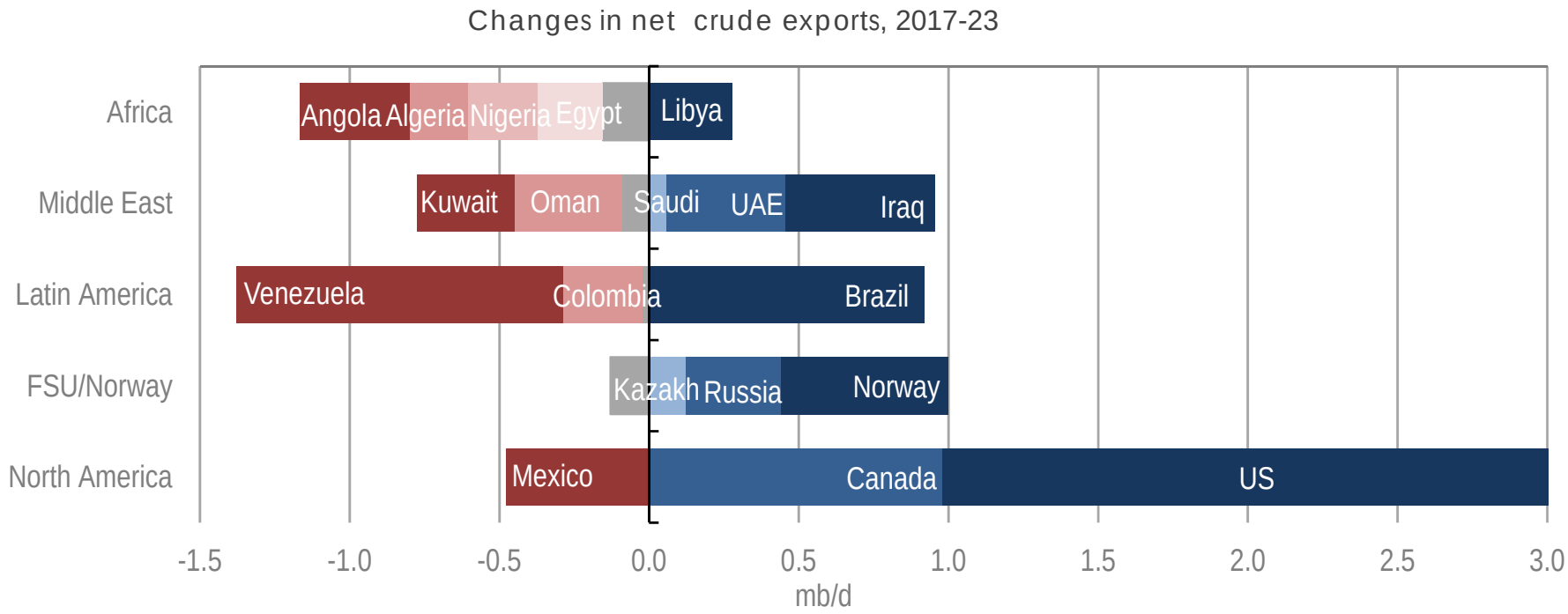
Refiners in Asia and Europe look for suitable crude oil to produce petrochemical feedstocks and low-sulphur fuels

China net crude oil imports double the US in 2023



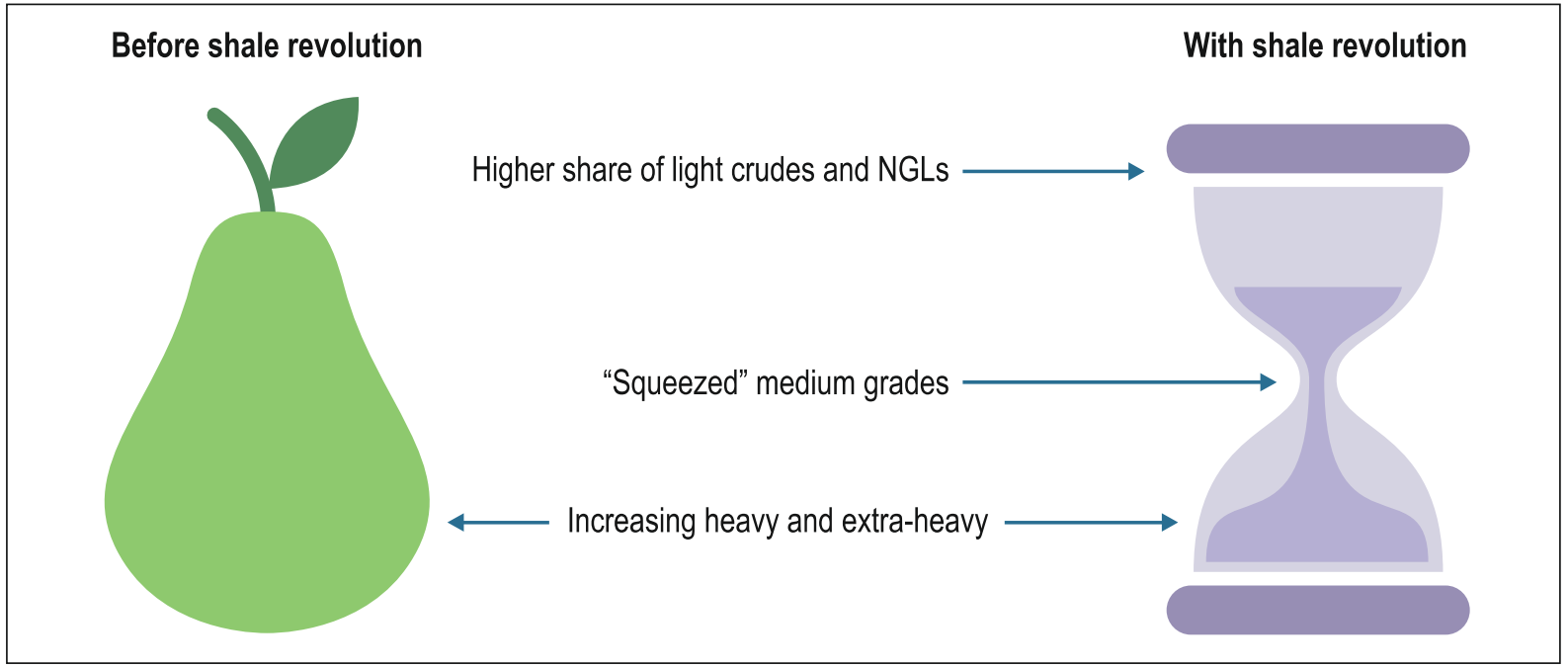
Indian imports, too, surpass the US in 2023 as shale growth reduces US import dependence.

Most incremental crude exports come from non-OPEC



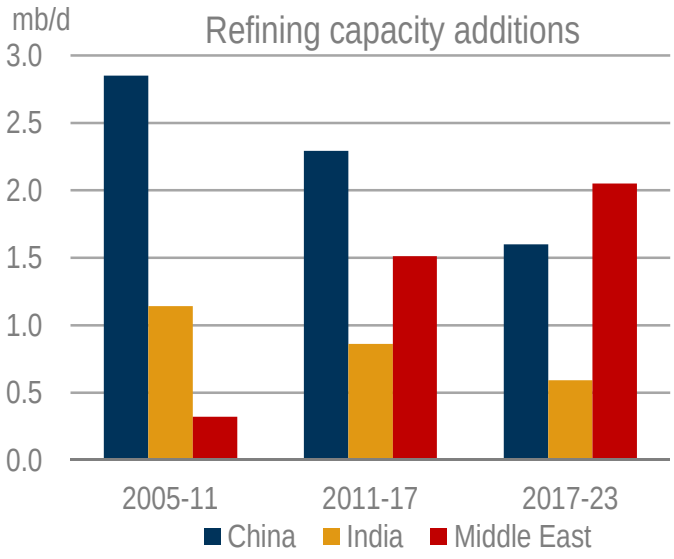
US refining capacity has absorbed most of the first wave of the Shale. Second wave goes to exports.

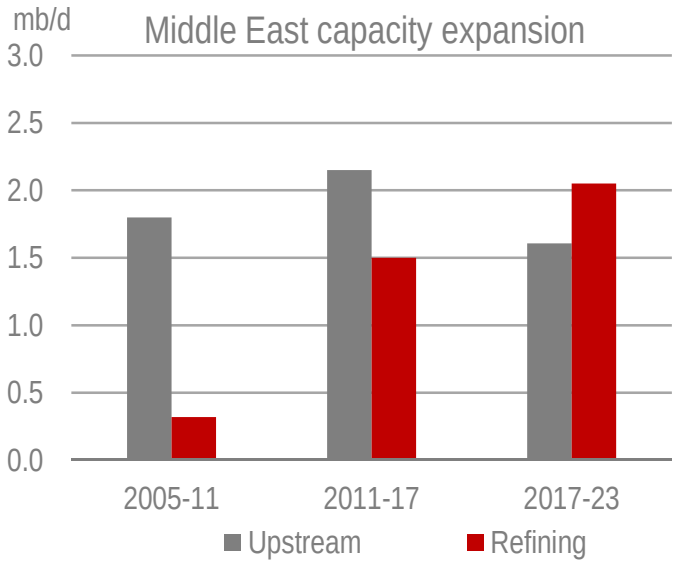
Future crude oil slate perceptions



Refiners need to invest into units to convert both very heavy and very light feedstocks.

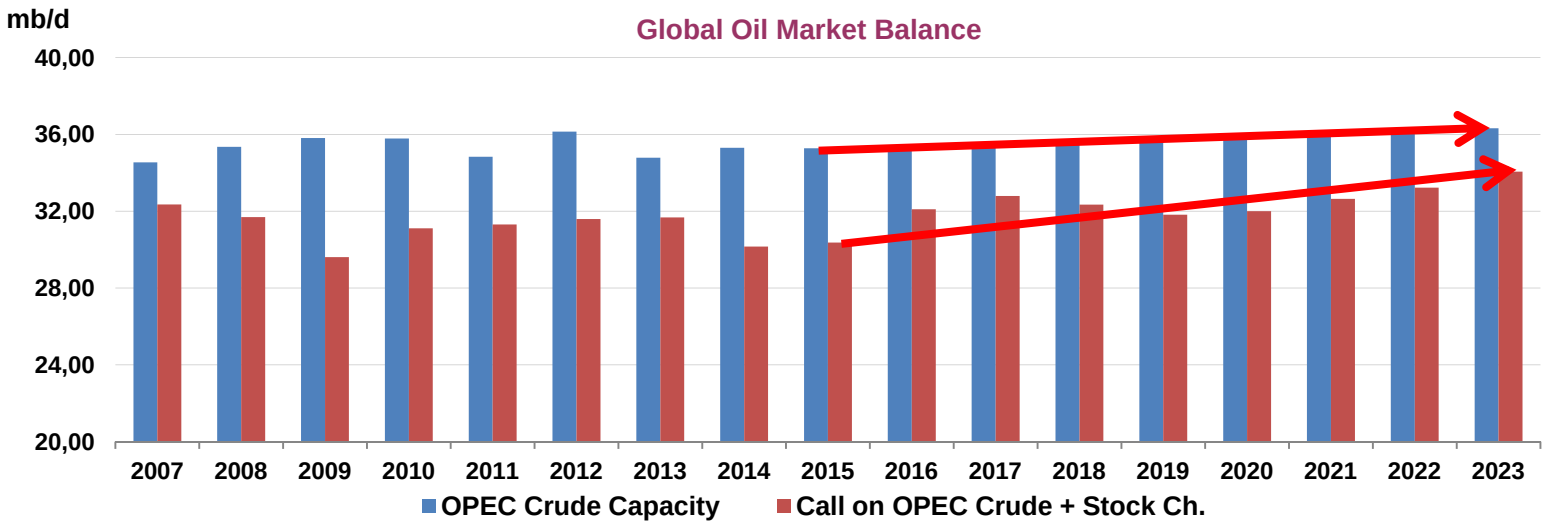
Middle East wants to refine more oil





Middle East accounts for 30% of global refining capacity growth.
International downstream expansion becomes a strategic objective for the region's NOCs.

Spare capacity cushion shrinks to lowest level since 2007



Supply/demand tighter at the end of the forecast

Key uncertainties

- Demand substitution, price subsidies/taxes
- OPEC/Non-OPEC production management
- Prices
- US LTO potential, midstream bottlenecks
- Investment strategies going forward, dividend strategies, interest rates
- Cost inflation
- Geopolitical risk/sanctions/trade

Conclusions

- Robust world oil demand growth to 2023 driven mainly by petrochemicals.
- Non-OPEC output growth exceeds demand increase through 2020.
- US, Brazil, Canada, Norway dominate growth. New infrastructure investments relieve US export bottlenecks.
- US crude finds new markets as refiners seek light, low sulphur crude to meet petrochemical demand and IMO specifications.
- More upstream investment needed today to meet future demand and offset 3 mb/d of declines from mature oil fields each year.
- As spare capacity cushion shrinks, supply security concerns remain critical.