



RystadEnergy

The Future of Oil & Gas Development to Meet Immediate Energy Needs

World Chemical Forum - Houston

Claudio Galimberti, North America Research Director

Emily McClain, Vice President North America Gas & LNG Markets

September 14, 2023

Meet the speakers



Claudio Galimberti

North America Research Director

Claudio Galimberti is the North America Research Director at Rystad Energy, leading a team of experts in the analysis of Oil & Gas Markets, Power, Renewables, Supply Chain, Shale, Upstream, Downstream, and Energy Transition in the North America region.

He is also the Head of Oil Demand, both short and long term, at global level.

An economist by training, he has worked in the oil industry for over 20 years, starting at Shell Trading in Europe and holding a variety of senior Strategy, Commercial and Analytics roles out of the US over the past 2 decades.

Prior to Rystad, he was with S&P Global Platts as Global Head of Demand, Refining, Agriculture & Risk. He was also at Trafigura as Global Head of Product Analysis.



Emily McClain

Vice President, North America Gas Markets

Emily McClain is a Vice President on Rystad Energy's Gas Markets team with over 10 years' experience in the oil and gas industry, having served in various technical roles with IHS Markit, Williams and Shell.

In her current role at Rystad, she is responsible for providing natural gas expertise focused on the North Americas gas market, including the United States, Canada and Mexico.

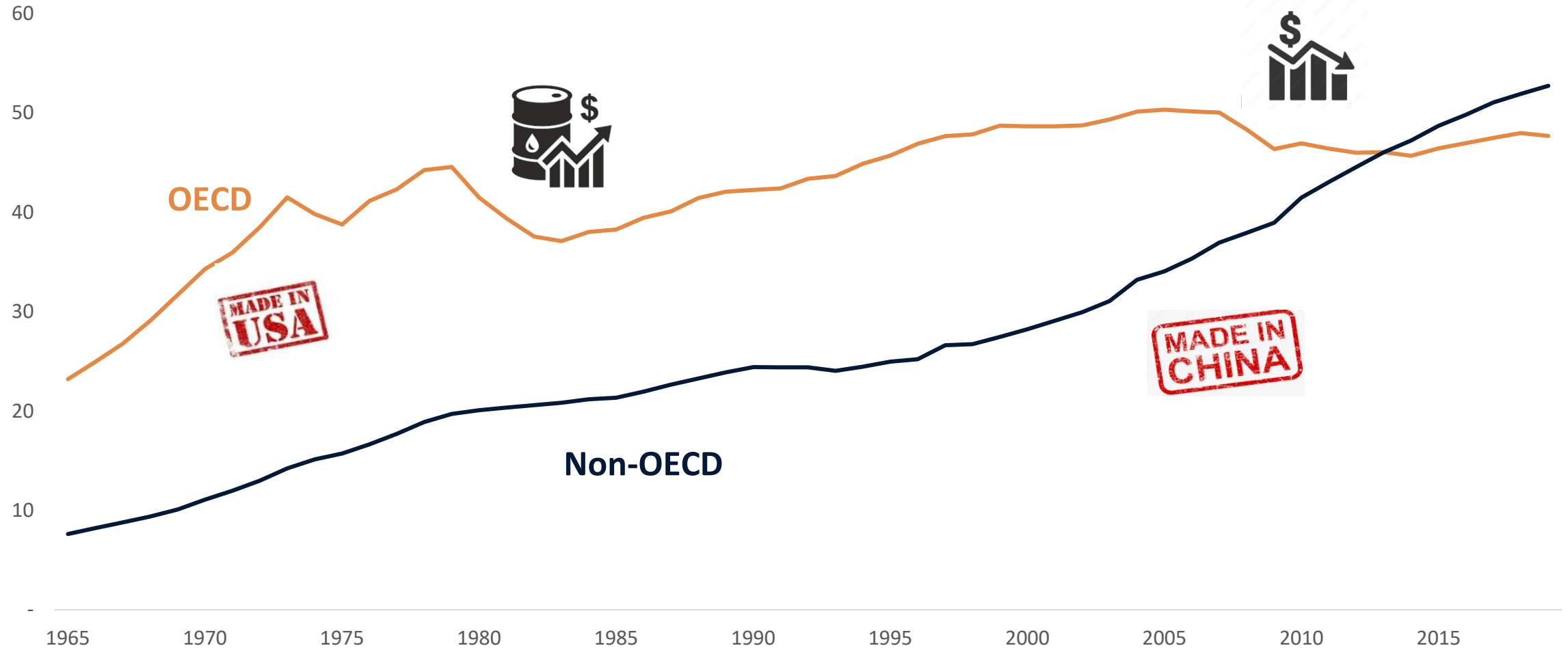
Her responsibilities include coverage of upstream, midstream and downstream gas as well as pricing analysis across different North American price hubs.

She is a frequent commentator on gas market affairs and has appeared on CNBC, Bloomberg, and other television and radio outlets.

Oil demand in OECD peaked in 2008. It keeps growing in non-OECD.

Global Oil Demand

Million barrels per day

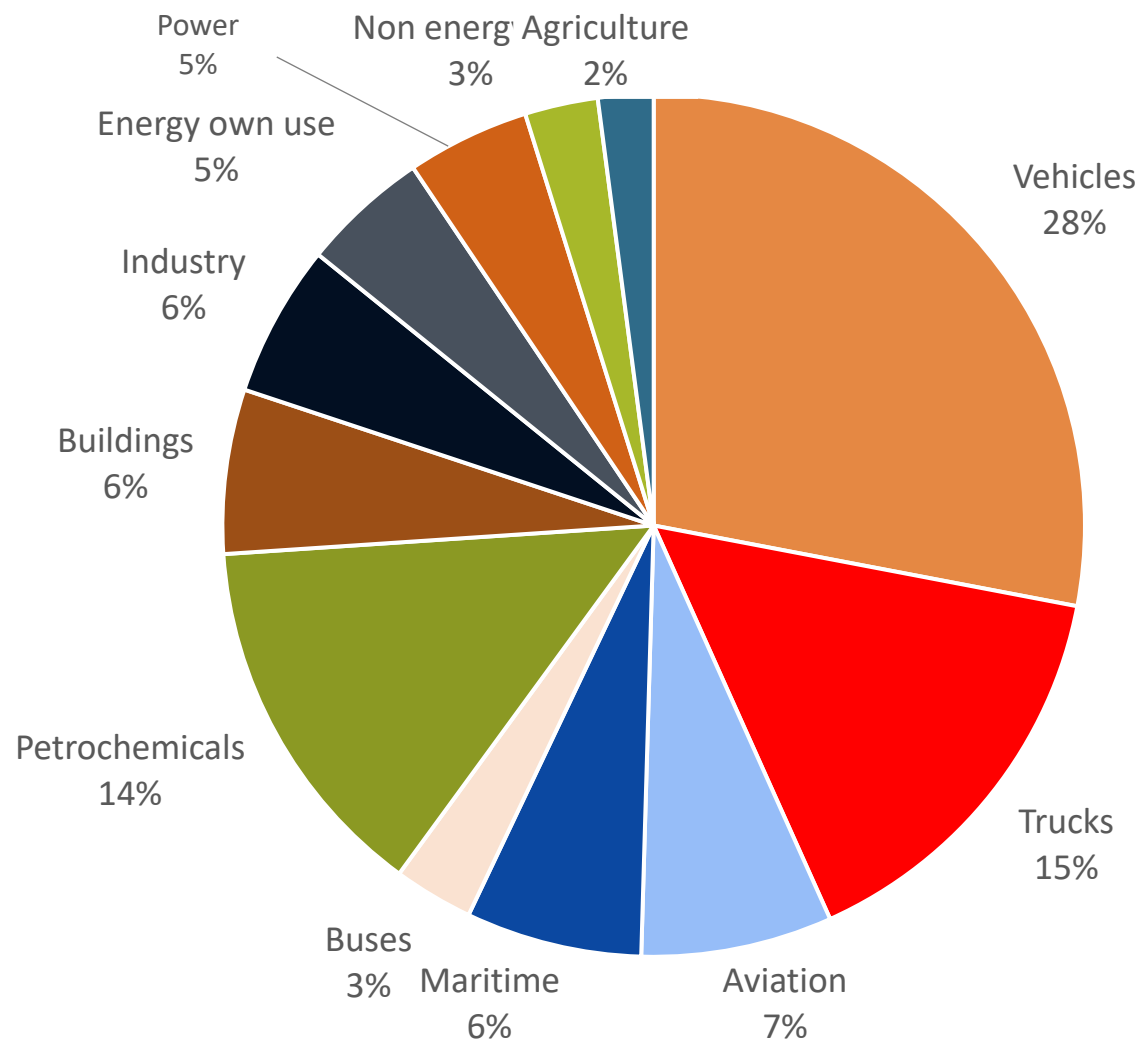


Source: Rystad Energy research and analysis, bp Statistical Review

Transportation represents around 60% of oil demand as of today

Global Oil Demand

Sectorial breakdown

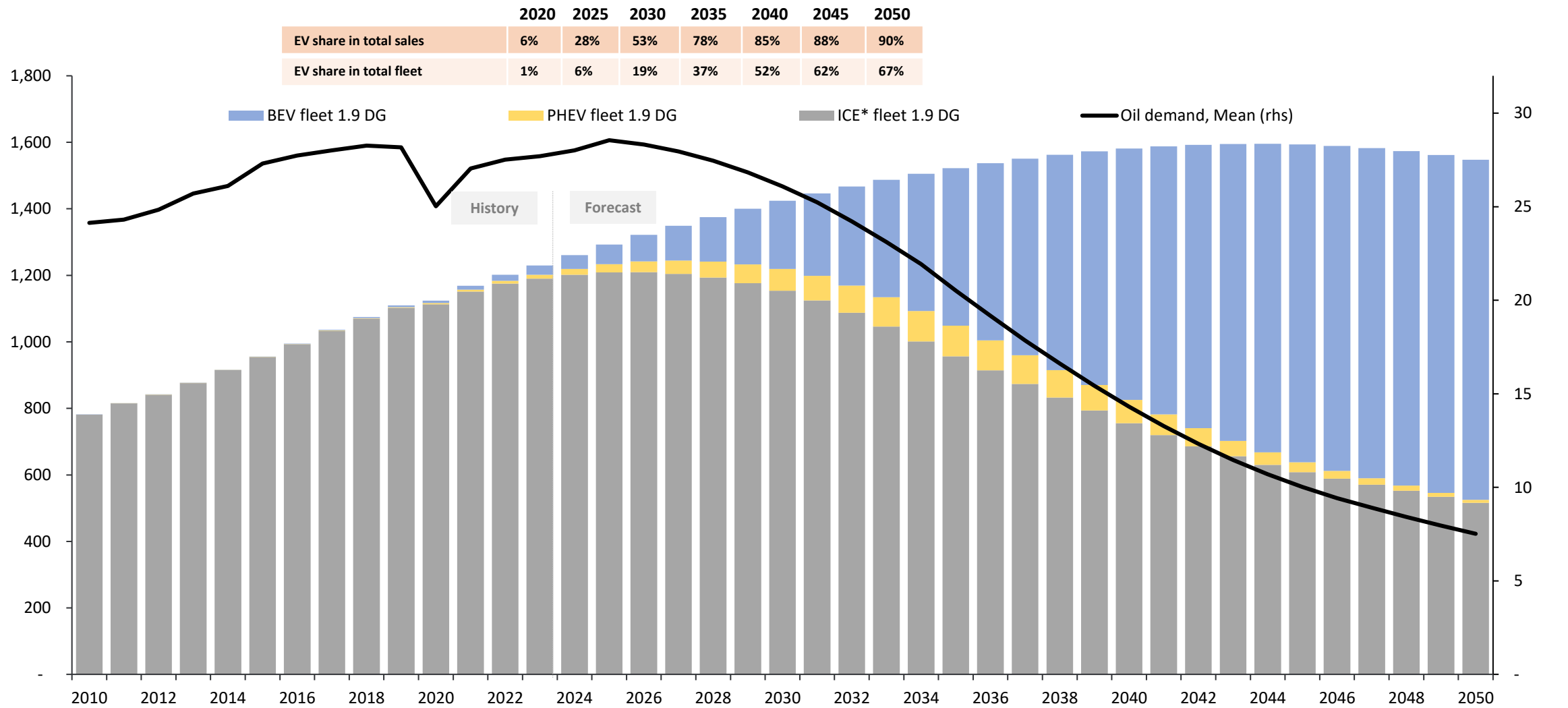


Source: Rystad Energy OTAS Demand Cube, August 2023

Capital stock associated with oil consumption takes time to turn over

Global passenger vehicle fleet
Million vehicles

Global passenger vehicle oil demand
Million barrels per day

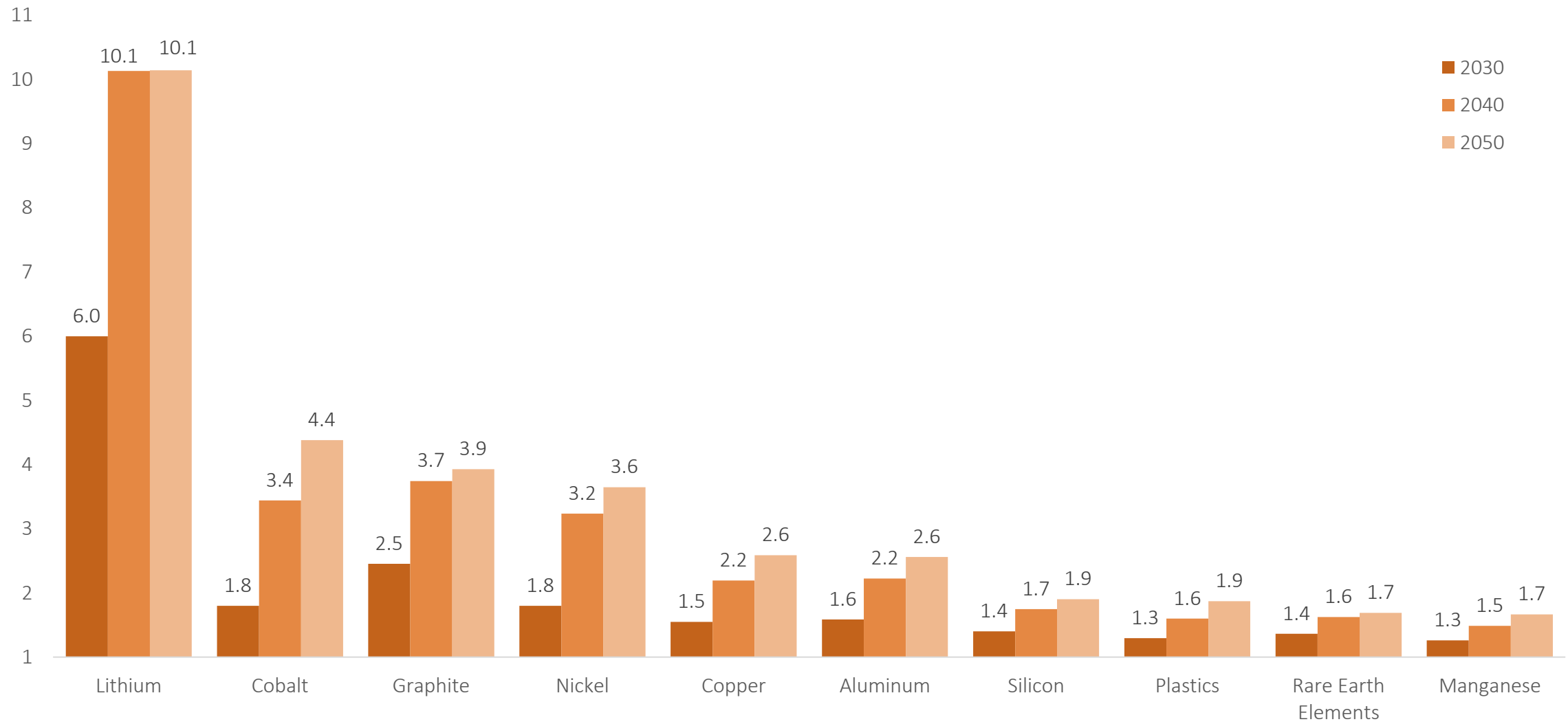


Source: Rystad Energy Oil Market Transition Solution, Rystad Energy OilMarketCube

Battery materials will see the largest demand growth towards 2050

Required material growth to facilitate energy transition, given Mean scenario

Growth multiple from 2022

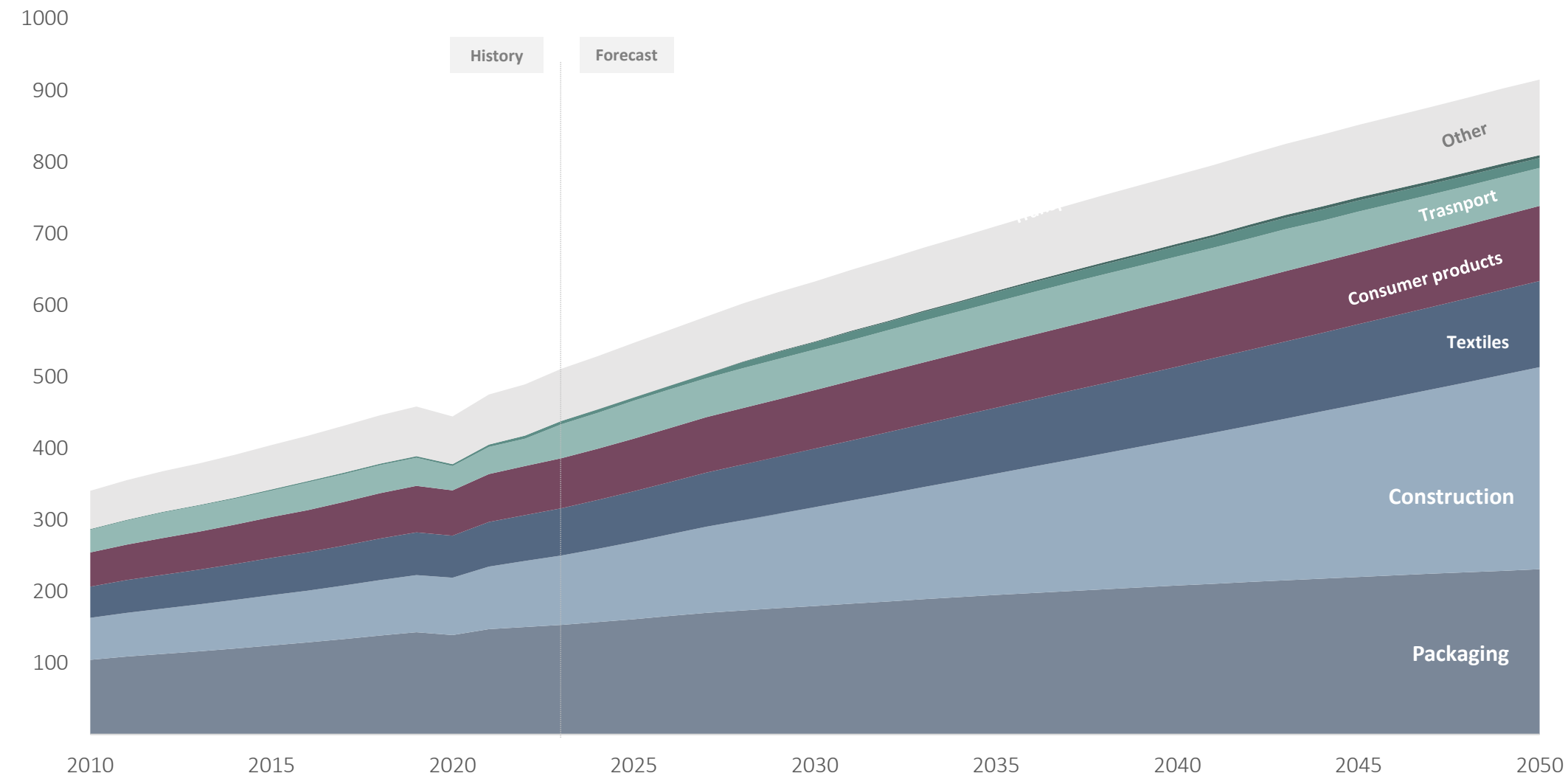


Source: Rystad Energy research and analysis

Plastics demand expected to double to 2050 driven by packaging and construction sectors

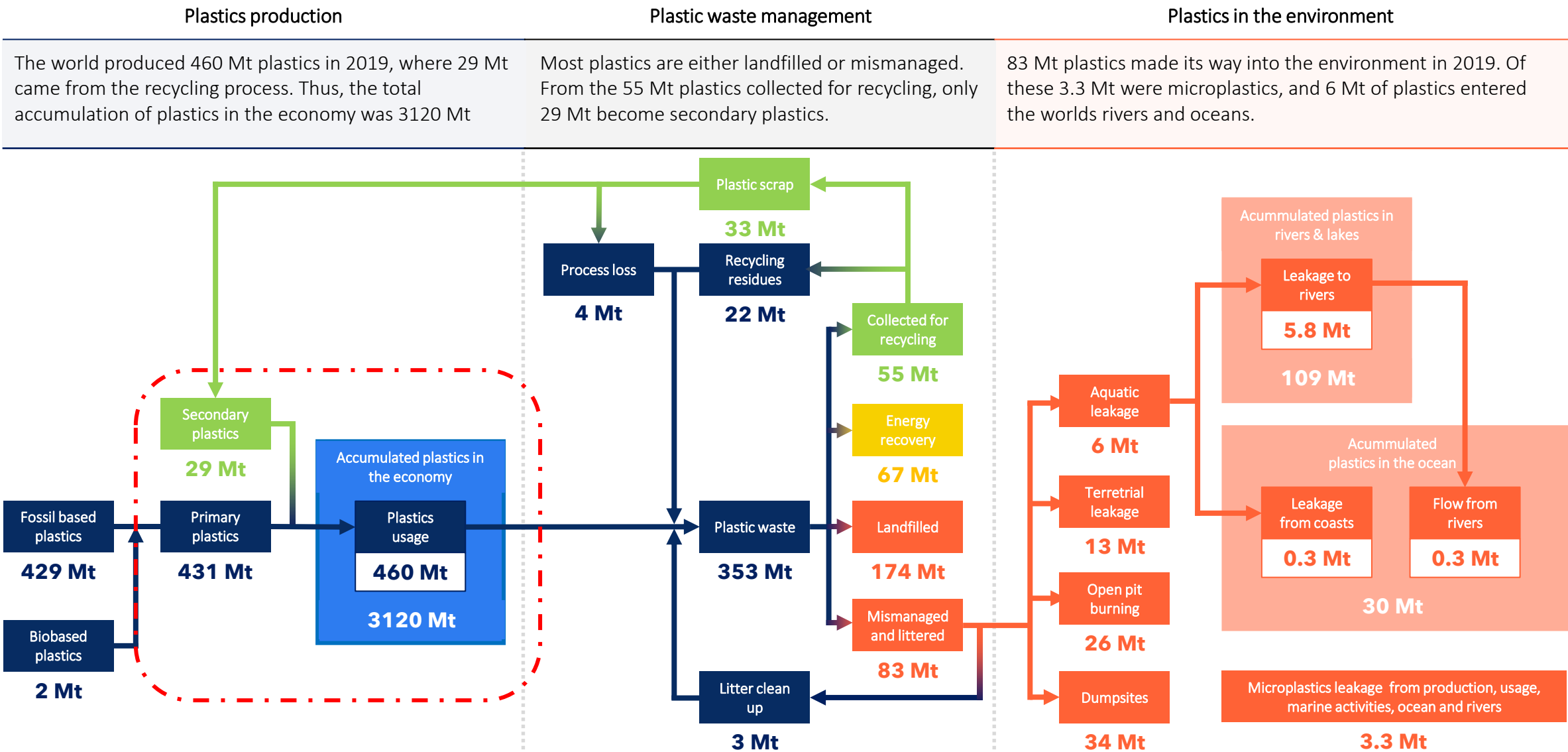
Petrochemical demand by sector 2010 - 2050

Million tons per year



Source: Rystad Energy research and analysis

Only 8% of plastic waste is currently recycled

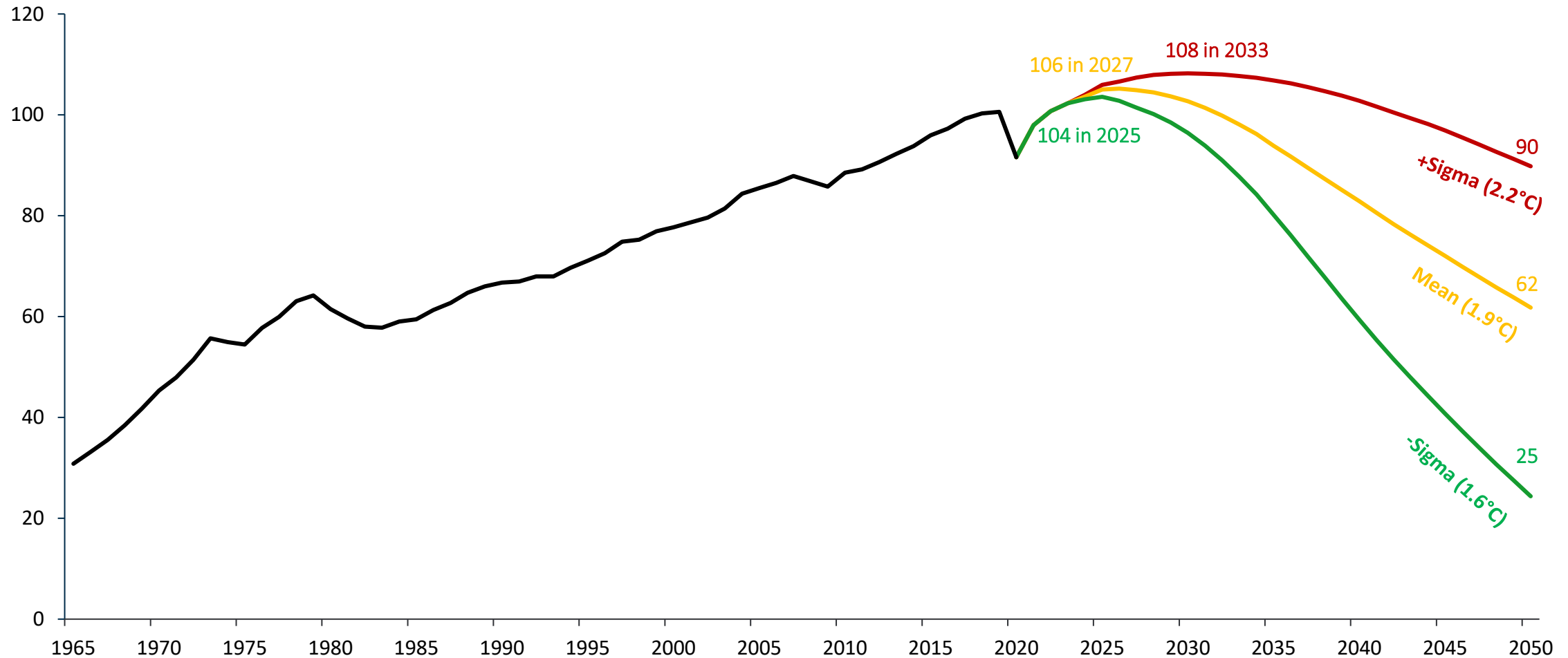


Source: Rystad energy research and analysis, OECD The future of petrochemicals,

Oil demand sticky in short-term, and depends on macro, technology, policy changes in long term

Long-term oil demand scenarios and historical demand

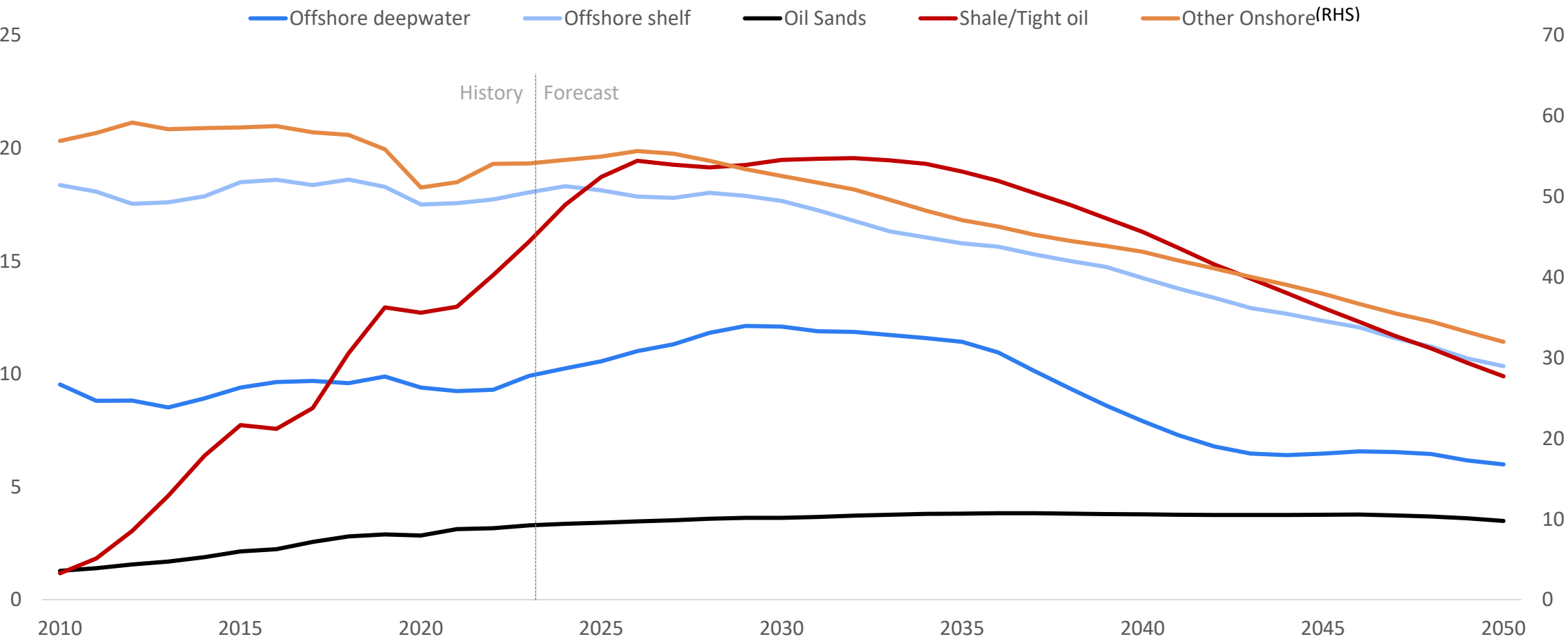
Million barrels per day



Source: Rystad Energy Oil Market Transition Solution, Rystad Energy OilMarketCube

Shale and offshore deepwater to increase under the Mean scenario

Liquids supply by Segment
Million barrels per day

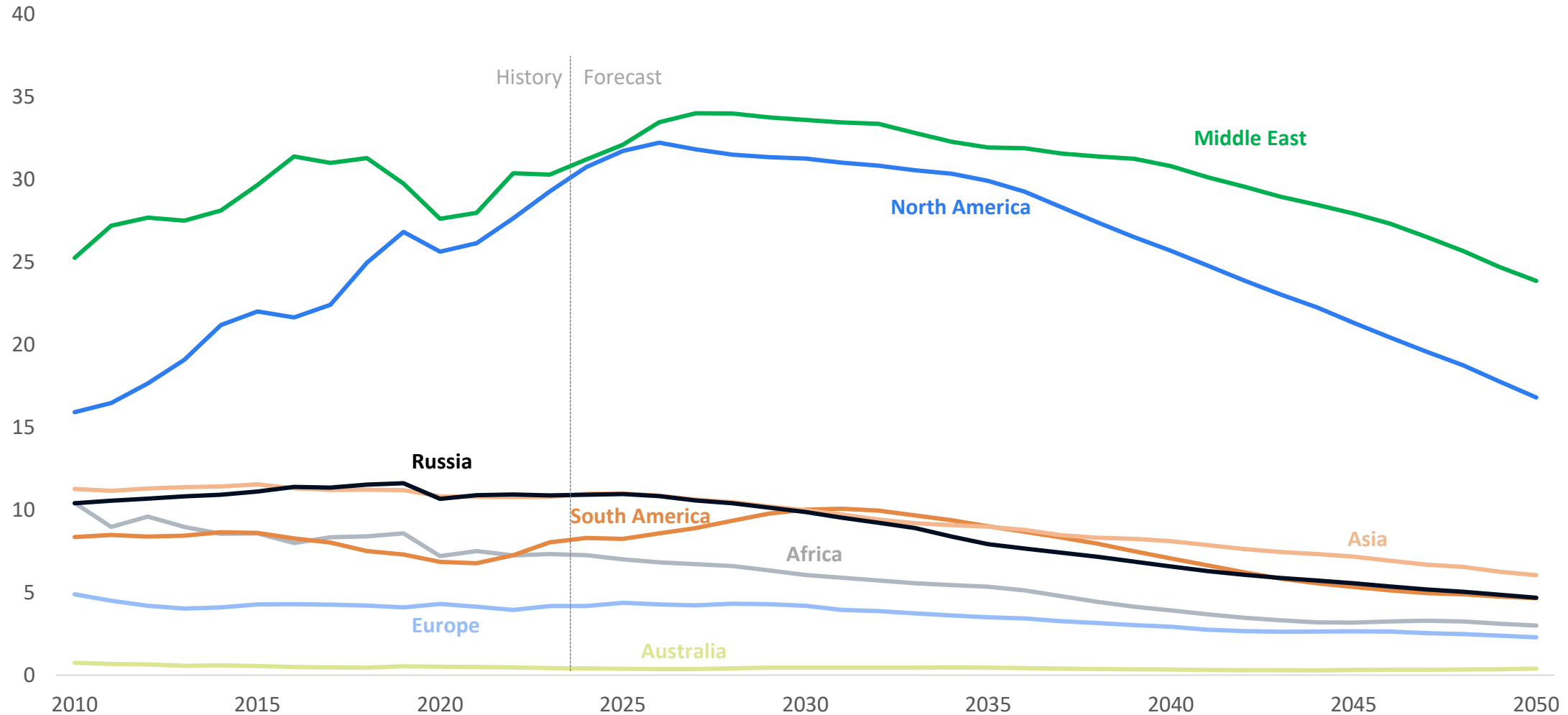


Source: Rystad Energy research and analysis, OilMarketCube, UCube

Middle East, North America dominate supply. Significant growth in South America thru 2030

Liquids supply by Continent

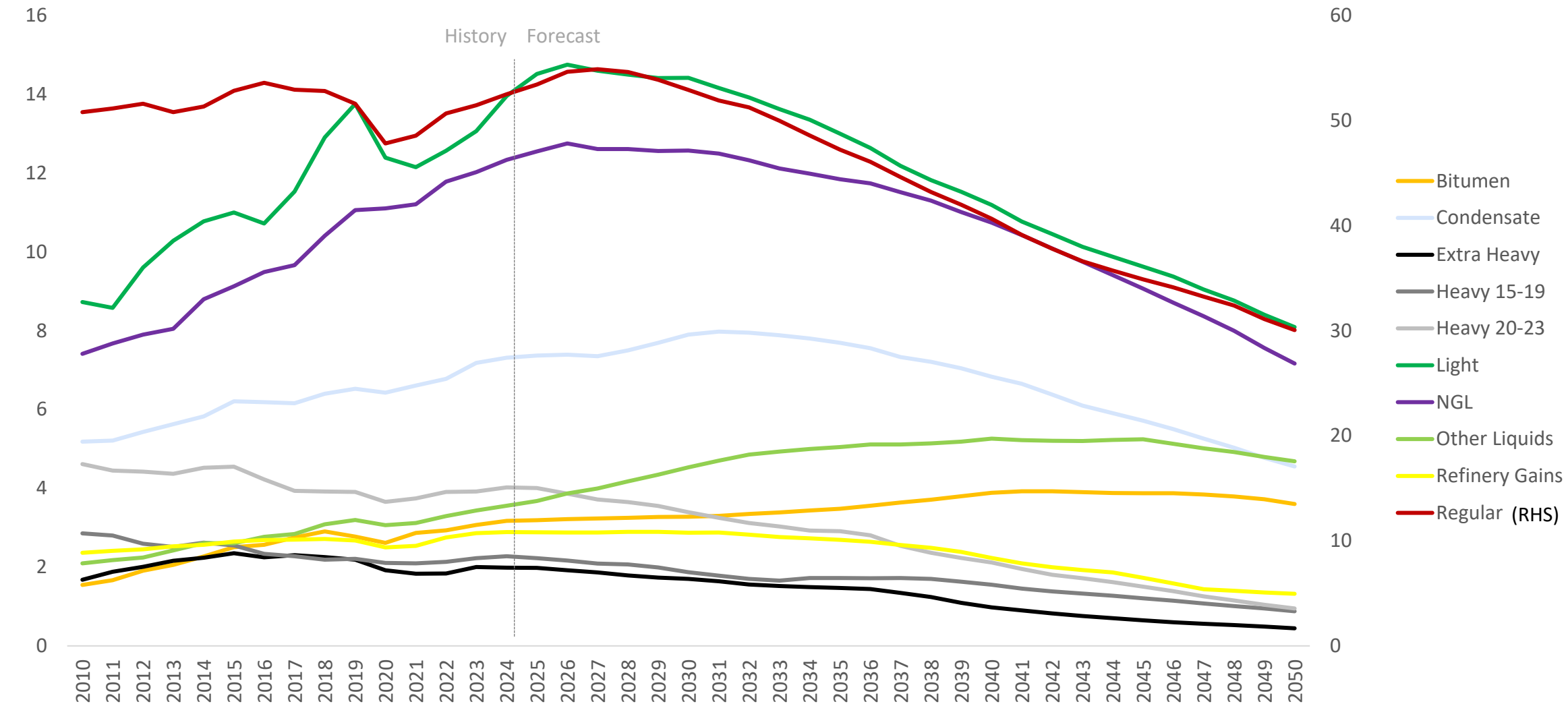
Million barrels per day



Source: Rystad Energy research and analysis, OilMarketCube, UCube

Global crude supply will continue to get lighter in next 10 years

Liquids supply by crude density
Million barrels per day

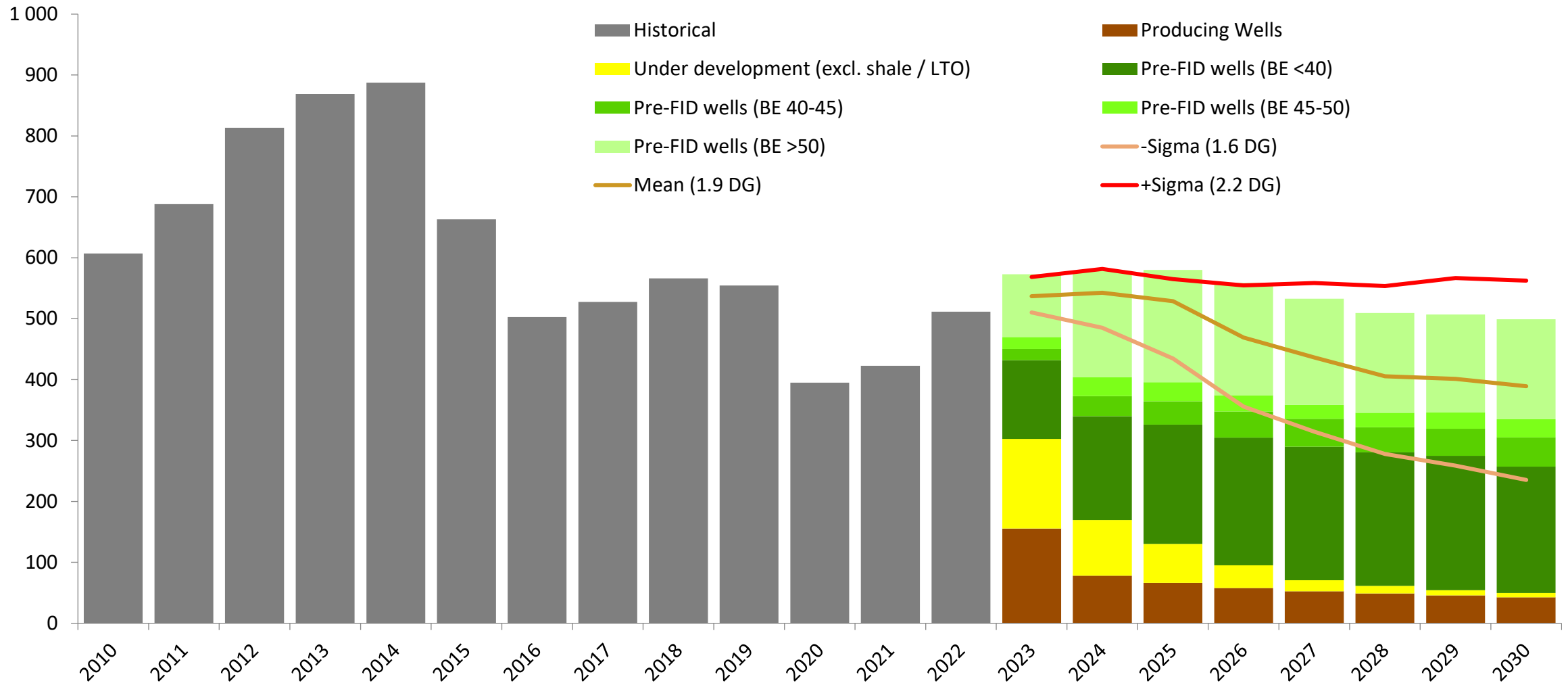


Source: Rystad Energy research and analysis, OilMarketCube, UCube

Capex spending barely enough for +Sigma, sitting good for mean demand scenario

Global upstream capex by life cycle and breakeven price for pre-FID wells

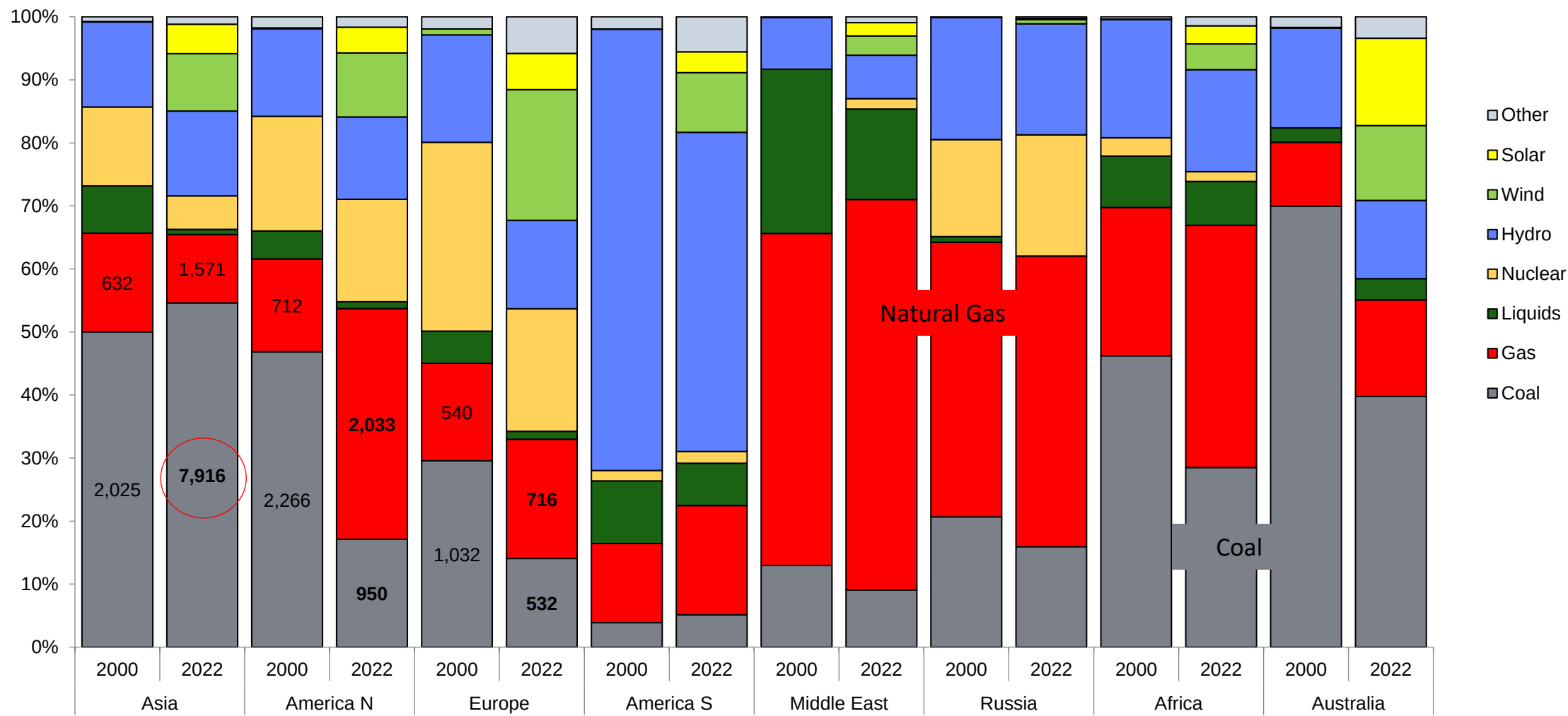
Billion USD (nominal)



Source: Rystad Energy UCube

Natural gas has had a central role in replacing coal; greatest future replacement opportunities in Asia

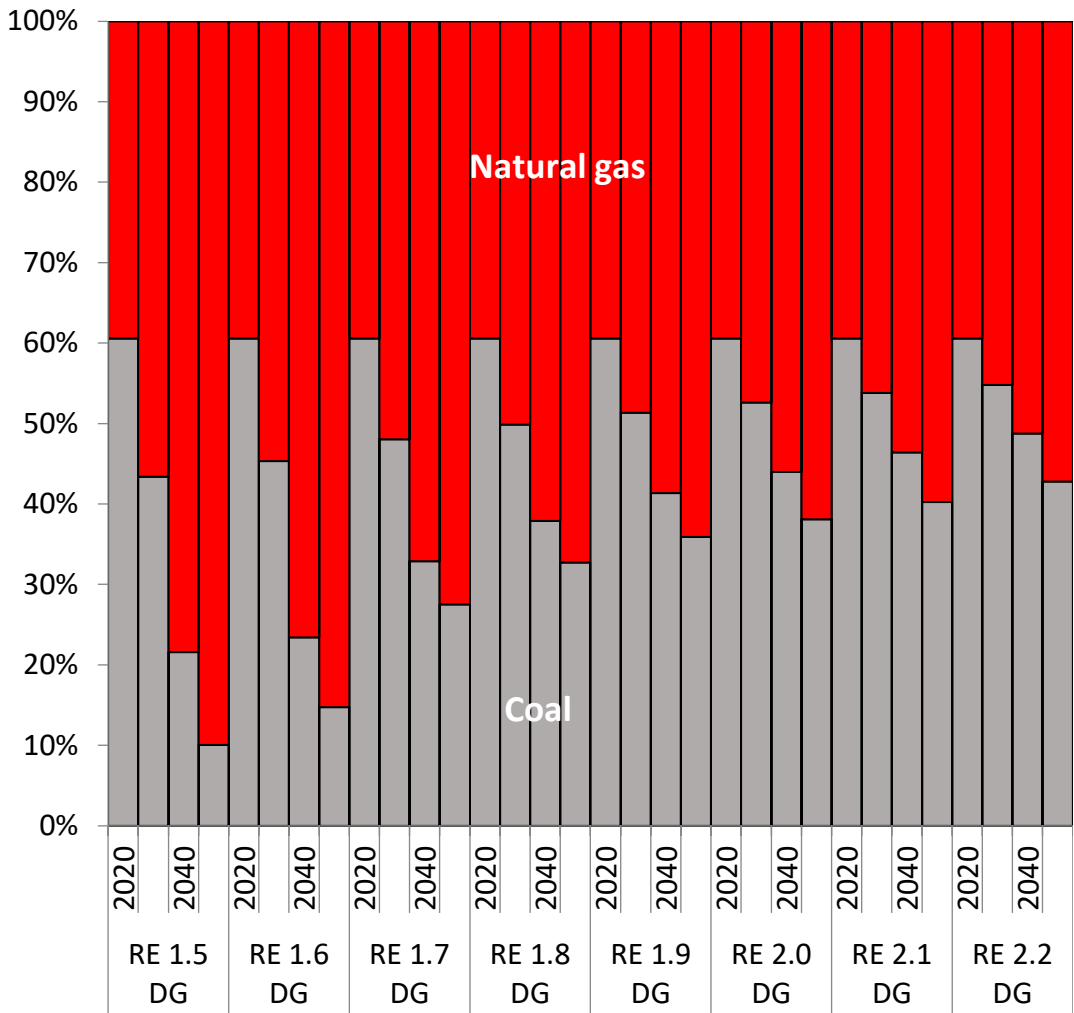
Power mix by continent, 2000 and 2022
Percent and TWh



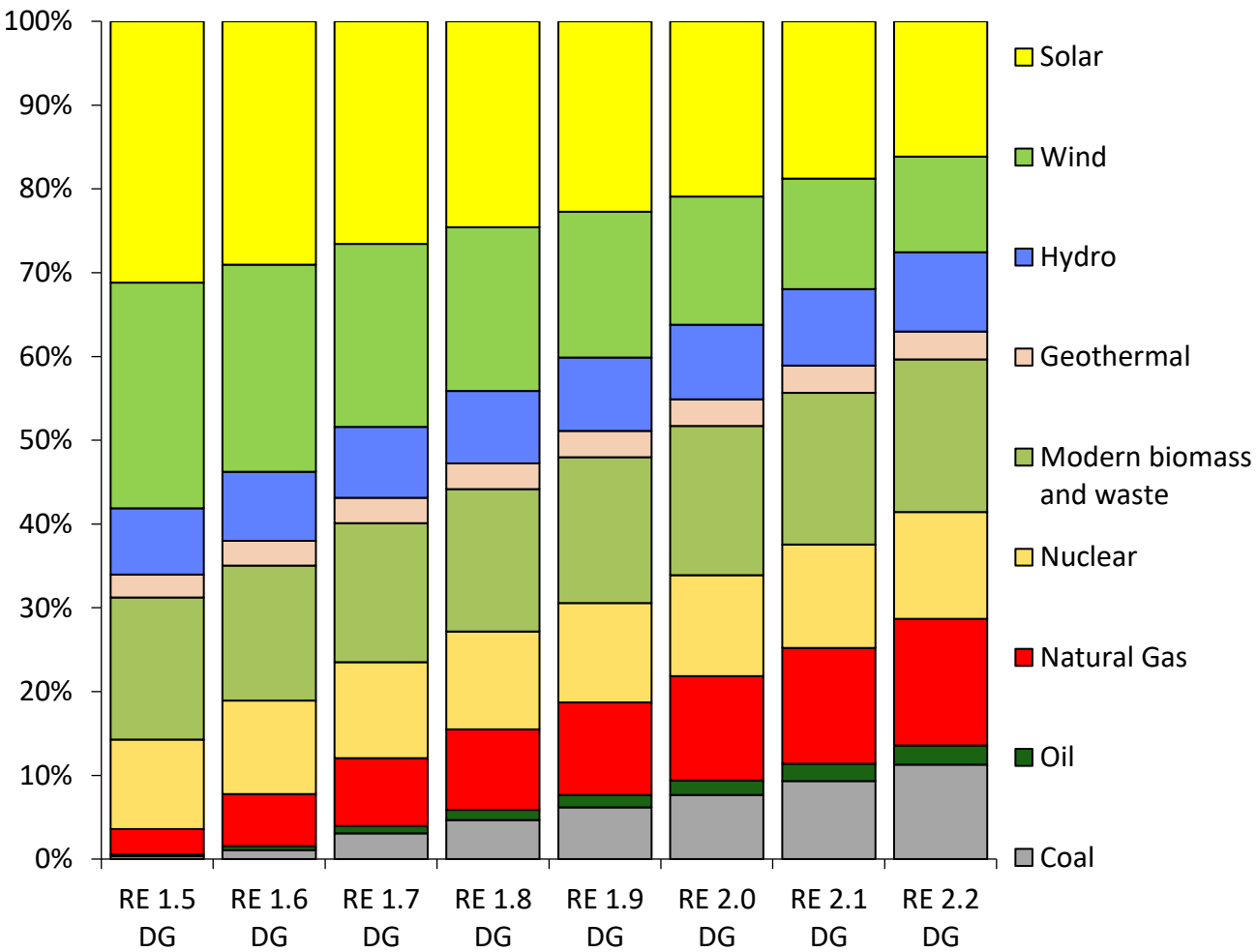
Source: Rystad Energy PowerCube

Significant C2G switching needed to reach lower degree scenarios ...before renewables dominate power mix

Share of natural gas vs. Coal by degree scenario, 2020-2050
Percent (%)

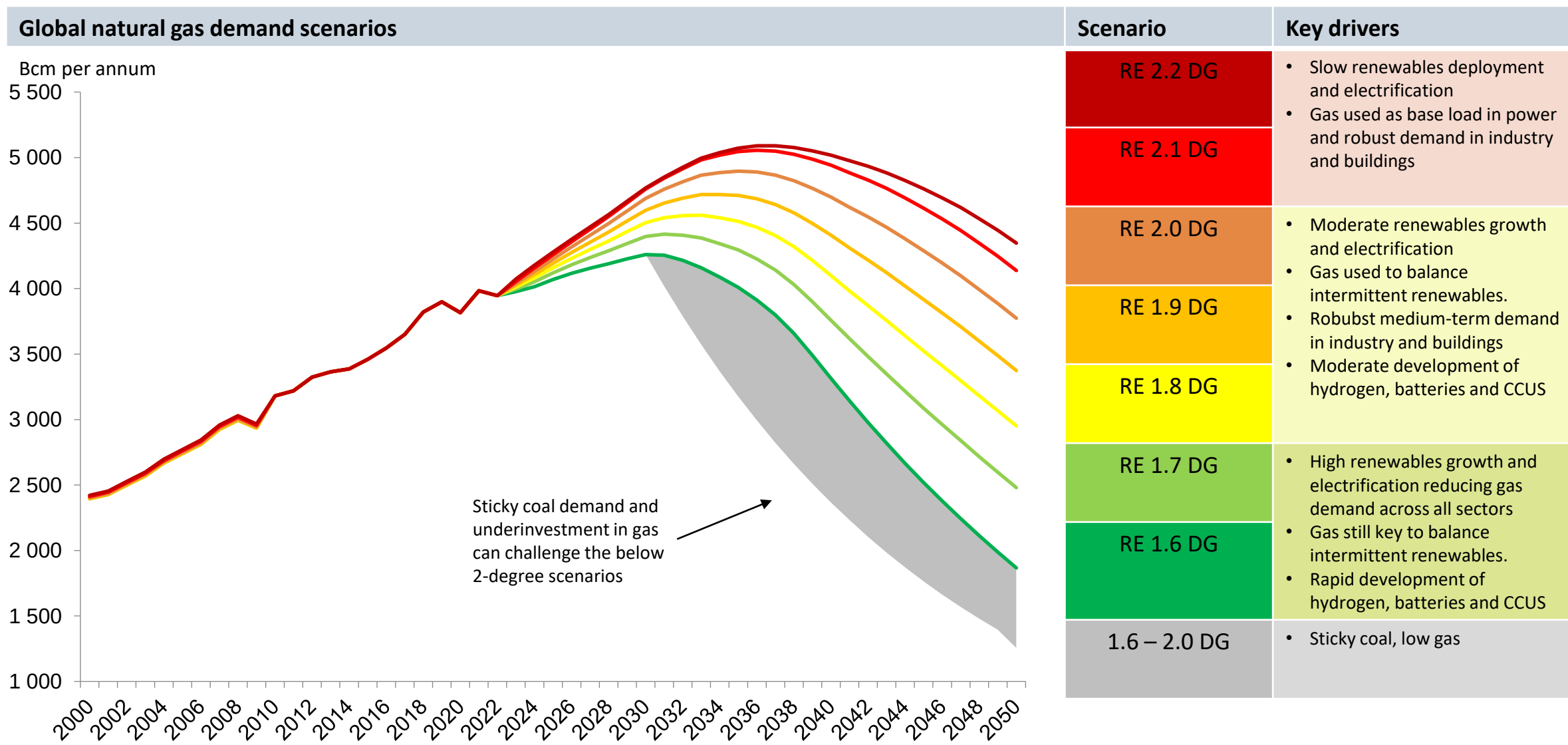


Power mix by degree scenario, 2020-2050
Percent (%)



Source: Rystad Energy Energy Scenario Cube

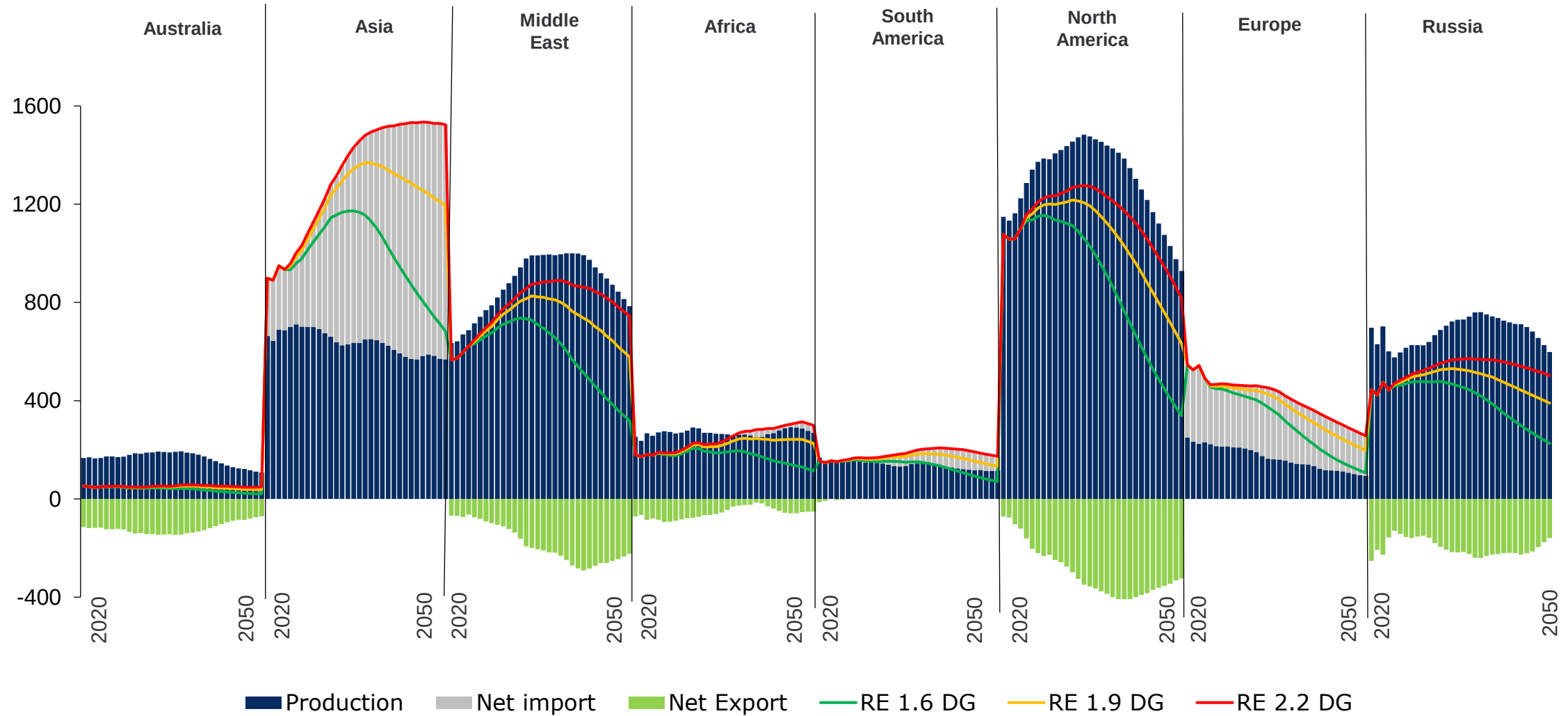
Pace of renewables growth key driver of long-term gas demand



Source: Rystad Energy Energy Gas Market Cube

Asian gas demand growth to rely on supply from US, Middle East and Africa... driving LNG demand growth

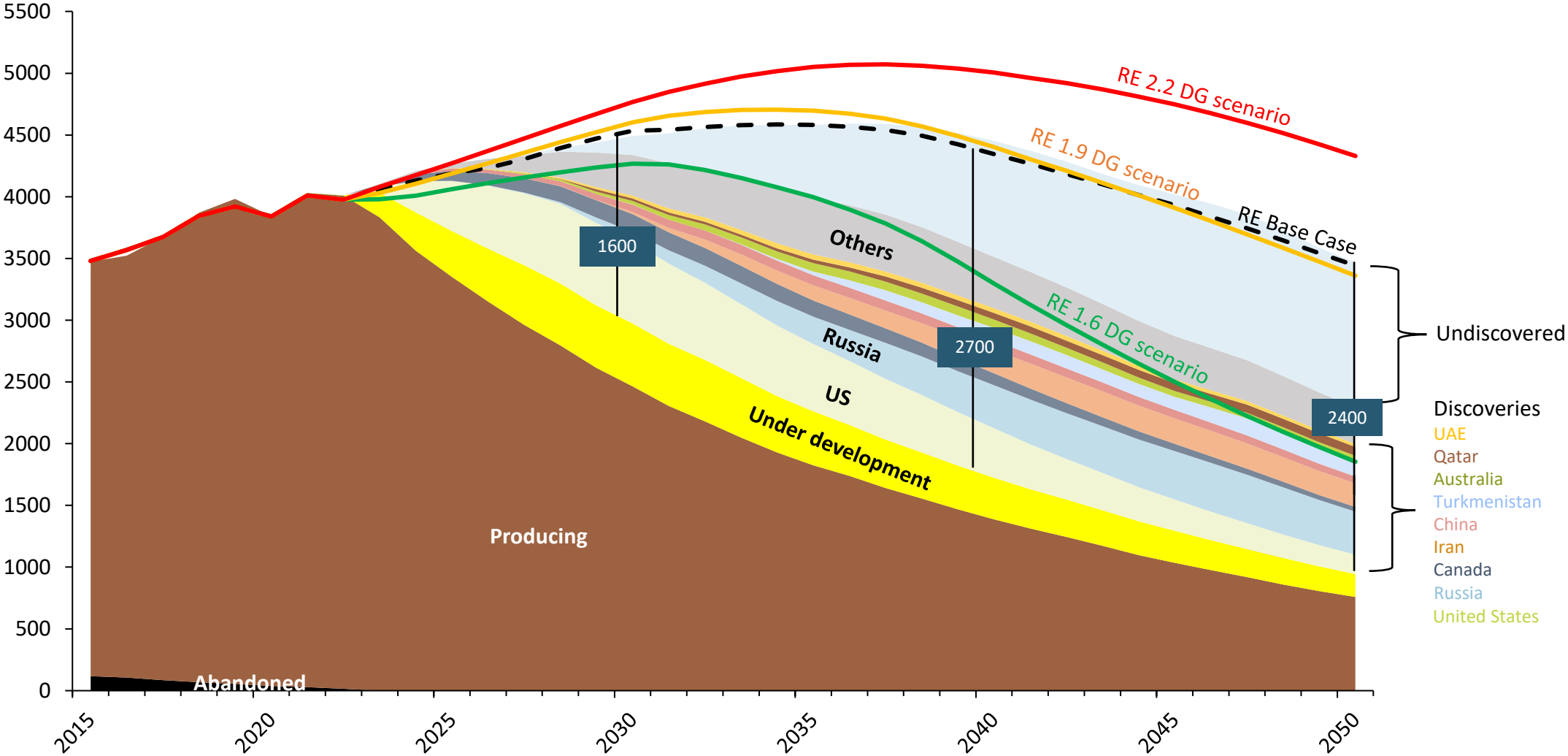
Base case supply vs demand by scenario by continent
Billion cubic meters



Source: Rystad Energy GasMarketCube

Significant upstream gas investments needed across all demand scenarios to secure long-term gas supplies

Natural gas supply by life cycle vs RE demand scenarios
Billion cubic meters



Source: Rystad Energy GasMarketCube, Rystad Energy research and analysis

...and robust LNG investments in new supplies needed in the 1.9 and 2.2 DG scenarios

