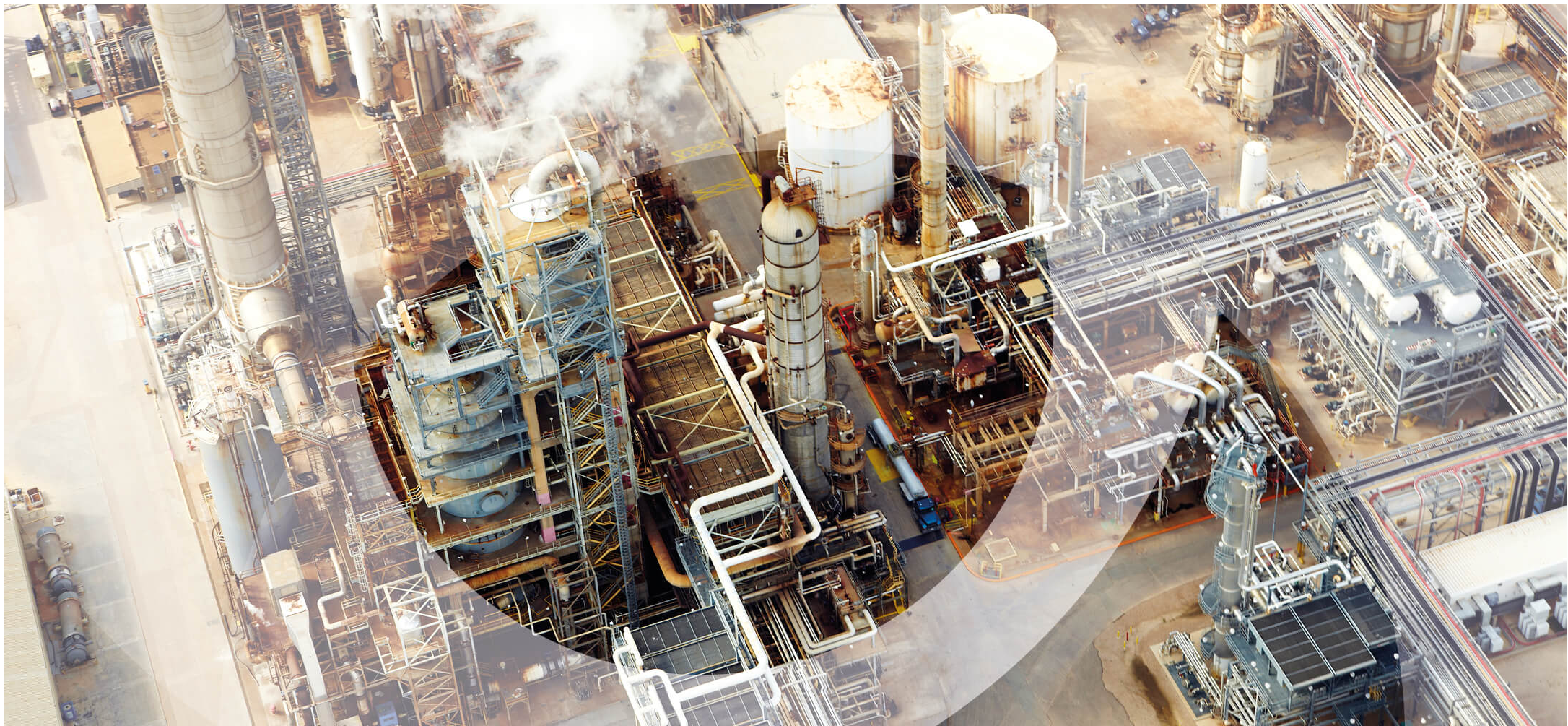


Investment and challenges in the petrochemical and refining sectors

IEA-IEF-OPEC Symposium

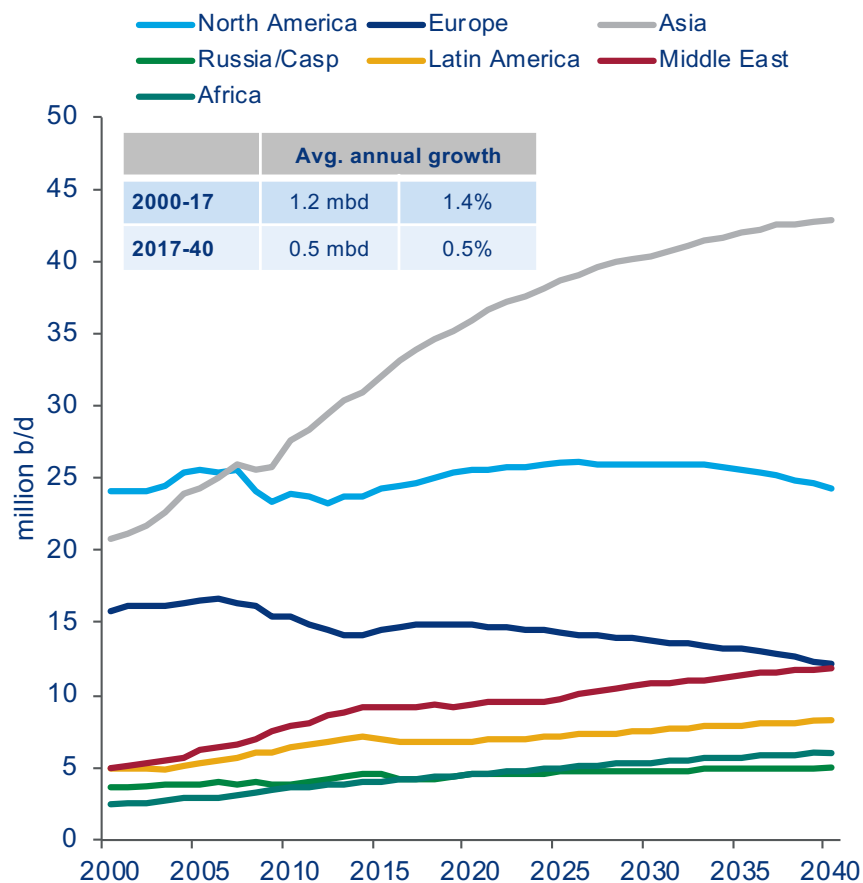
Johnny Stewart, Principal Analyst, February 2019



Demand growth slowing, transitioning west to east, end-use changing

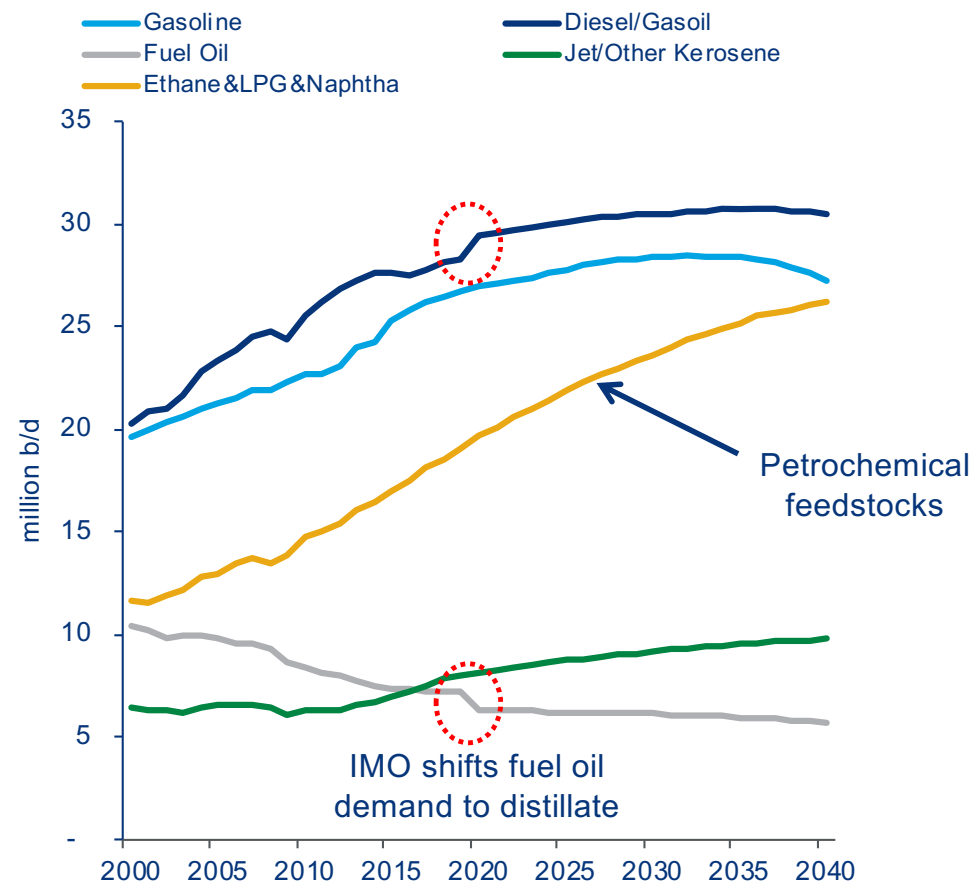
Europe and NA lead the decline in global demand, petrochemical feedstock use grows

Global demand by region



Source: Wood Mackenzie

Global demand by product

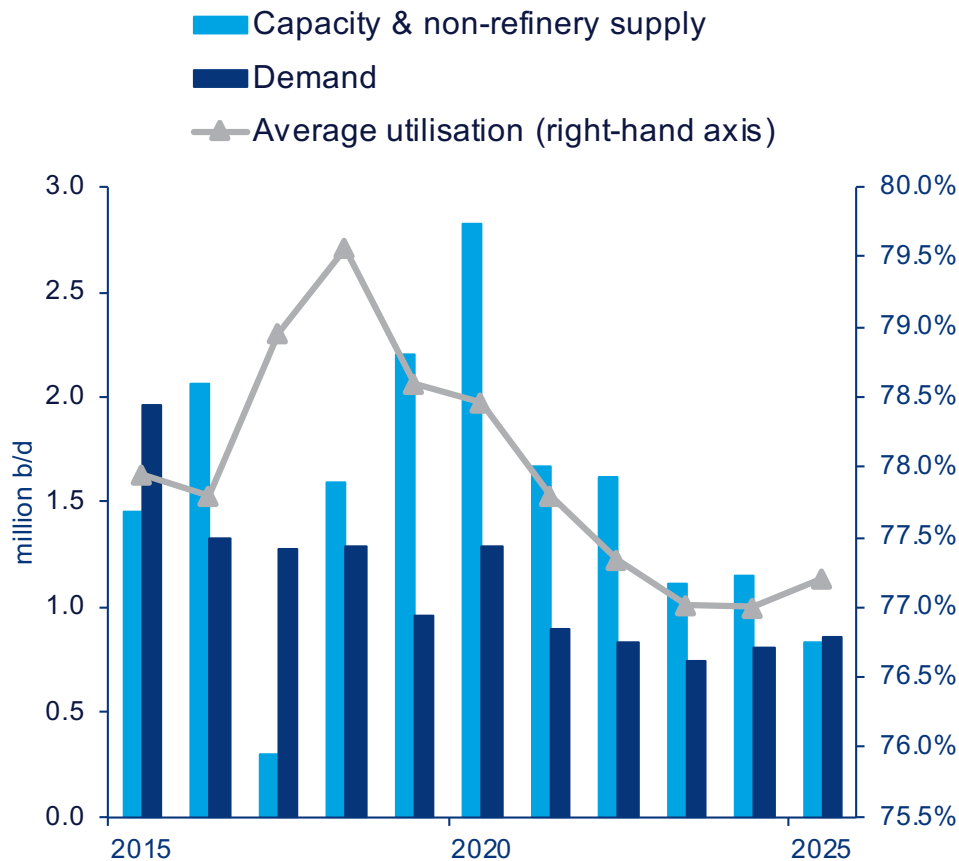


Source: Wood Mackenzie

Refining capacity additions start to outpace global demand growth

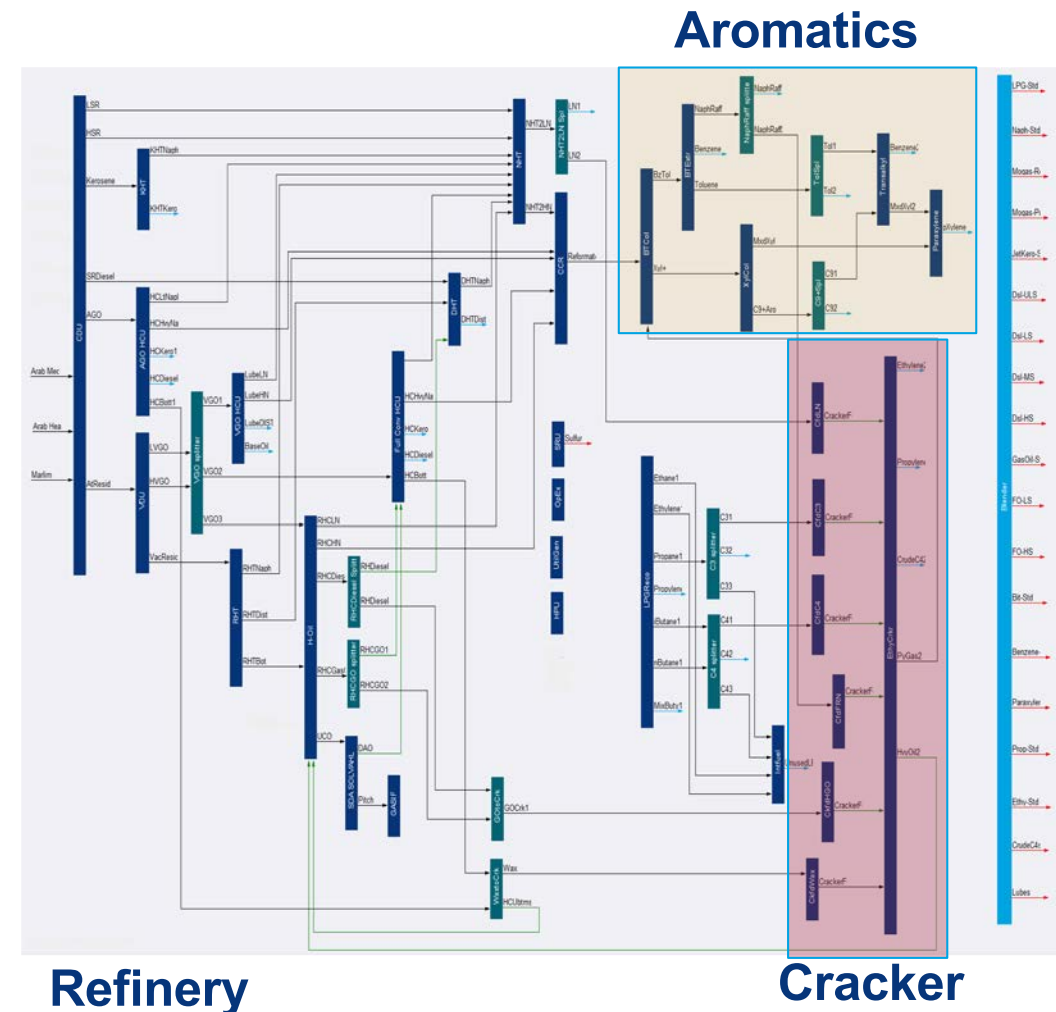
Greenfield integrated complexes are highly competitive, pressuring weaker sites

Global refining capacity versus demand



Source: Wood Mackenzie, Product Markets Service

Hengli, China, integrated complex



Middle East NOCs are evolving through the value chain

Margin 'leak' a thing of the past, exposure to different segments insulates from volatility

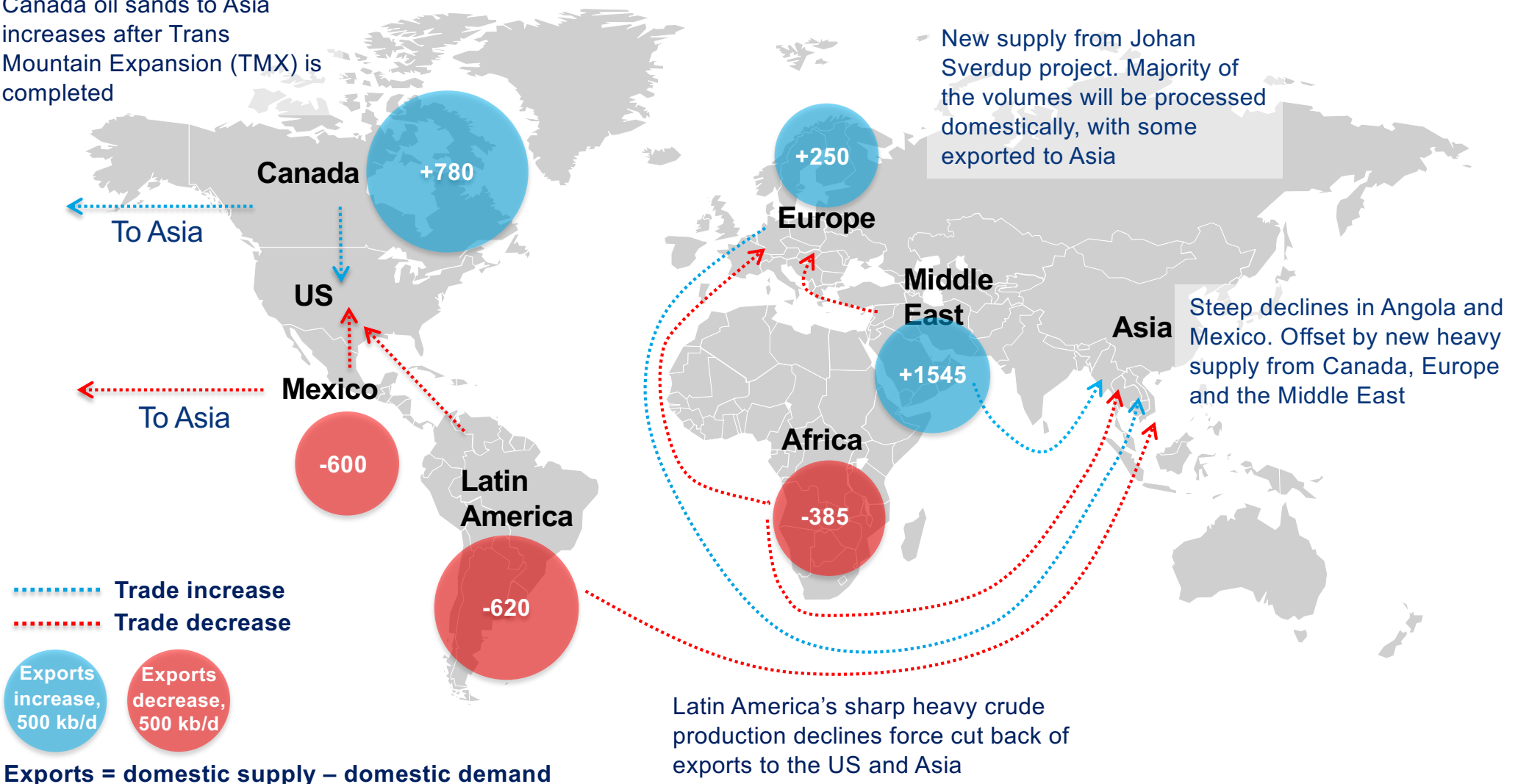
	Producer?	Refiner?		Petro-chemicals?	Gas?	Shipper?	Trader?	Retailer?
		Domestic	International					
BAPCO								
K-Companies								
Oman Oil								
Saudi Aramco								
NIOC								
Iraq Ministry of Oil								
ADNOC								

Customer base is changing, relationships have to evolve

Heavy crude demand increases due to upgrading projects, sources of supply change

Key changes to heavy crude trade (2025 minus 2017), kb/d

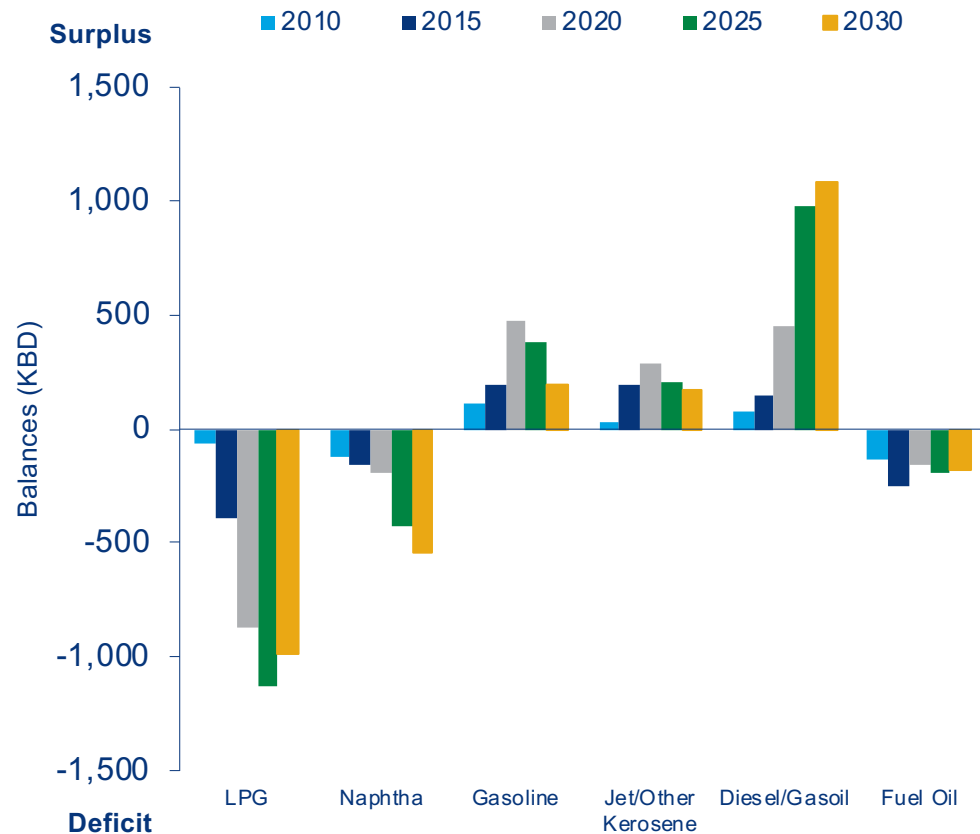
Canada oil sands to Asia increases after Trans Mountain Expansion (TMX) is completed



Opportunities are very rarely uniform, molecule placement is key

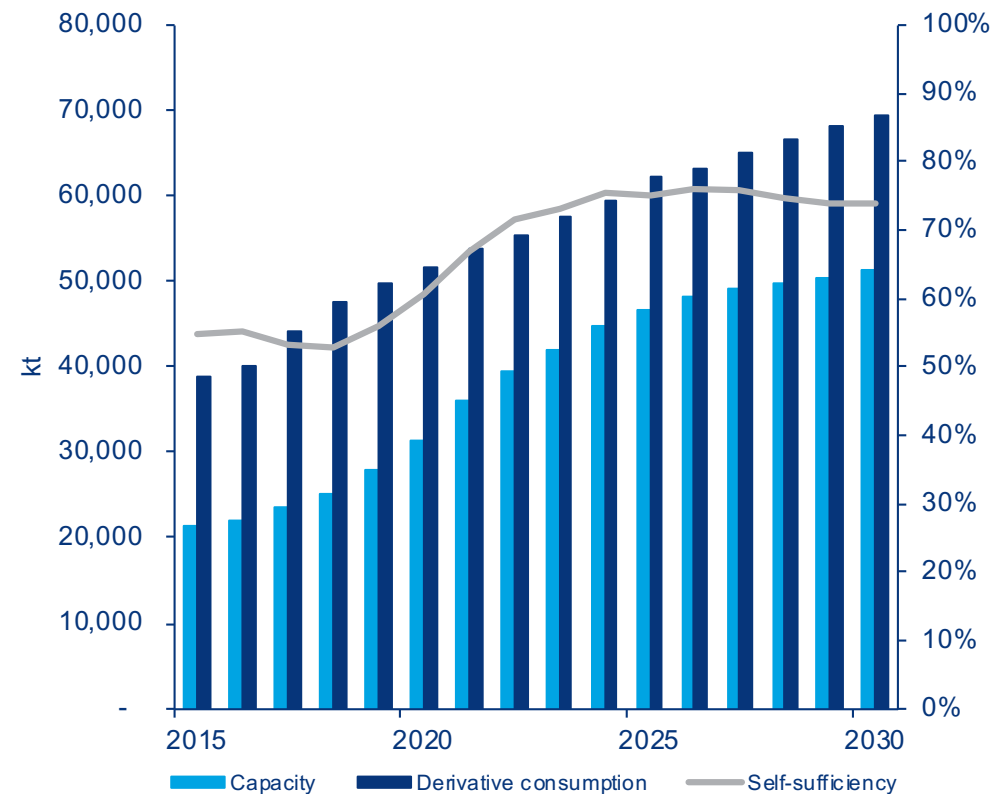
Ethylene derivative import requirement slowing as capacity additions complete

China All Supply Balance



History: IEA Energy Statistics, Forecast: Wood Mackenzie

China Ethylene balance



Source: Wood Mackenzie

Conclusions

- **Global demand continues to grow but at a slower pace**
- **Greenfield integrated sites are more resilient through utilisation downturn**
- **Participation along the entire value chain protects against different business cycles**
- **There is no one-size-fit-all-option; need a holistic approach across your business**



Johnny Stewart

Principal Analyst EMEARC, Dubai, UAE

Biography

Johnny Stewart is a core member of Wood Mackenzie's Downstream, Midstream and Chemicals Research team and is responsible for developing and delivering research content to clients.

Johnny has worked in Wood Mackenzie's research division for nine years and is responsible for analysing refinery supply, infrastructure and investments across the Middle East, Europe and Africa.

Johnny compiles Wood Mackenzie's long and short term view on all products supply/demand balances in the Middle East and is responsible for individual refinery asset benchmarking and analysis in the region.

Prior to joining Wood Mackenzie, Johnny achieved an Honours Degree in Mechanical Engineering with Management from The University of Edinburgh, Scotland.

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