

Will NW European gas hubs become the new Brent for LNG?

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Global LNG Summit – Flame 2019

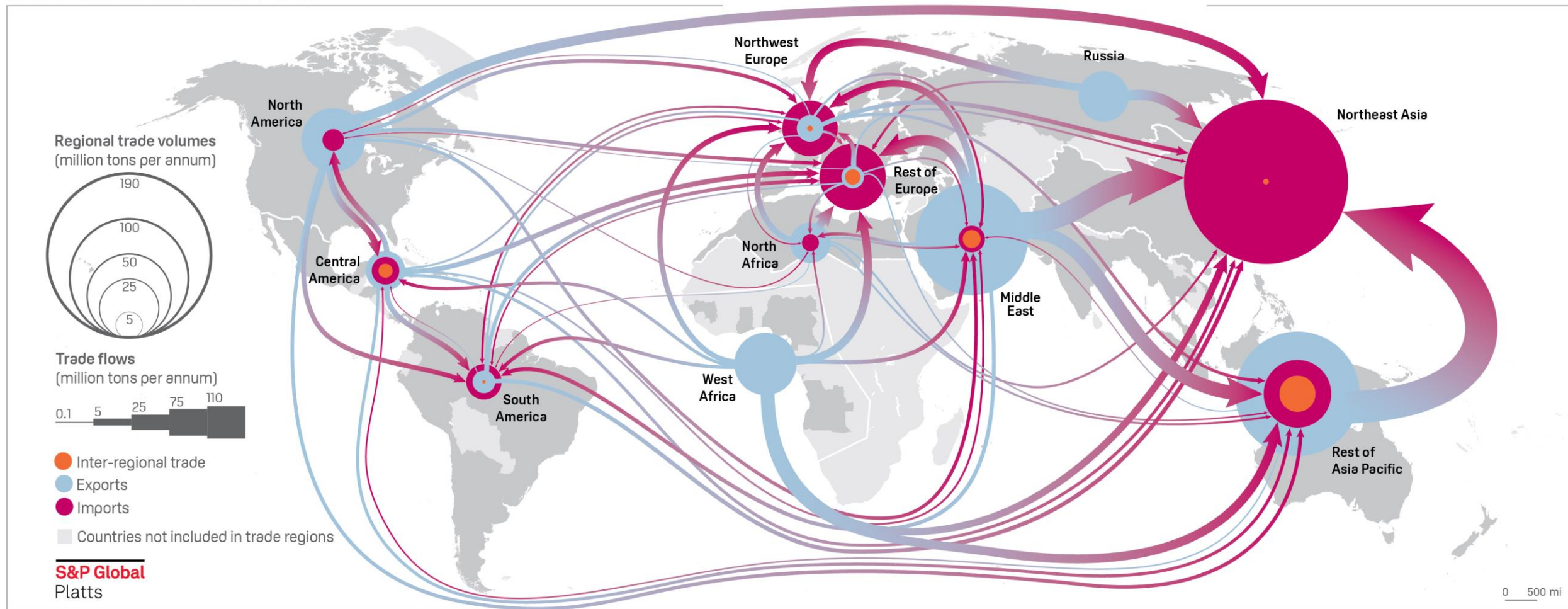


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LNG trade flows in 2018 gradually shifted from a demand pull into Asia to a supply push into Europe

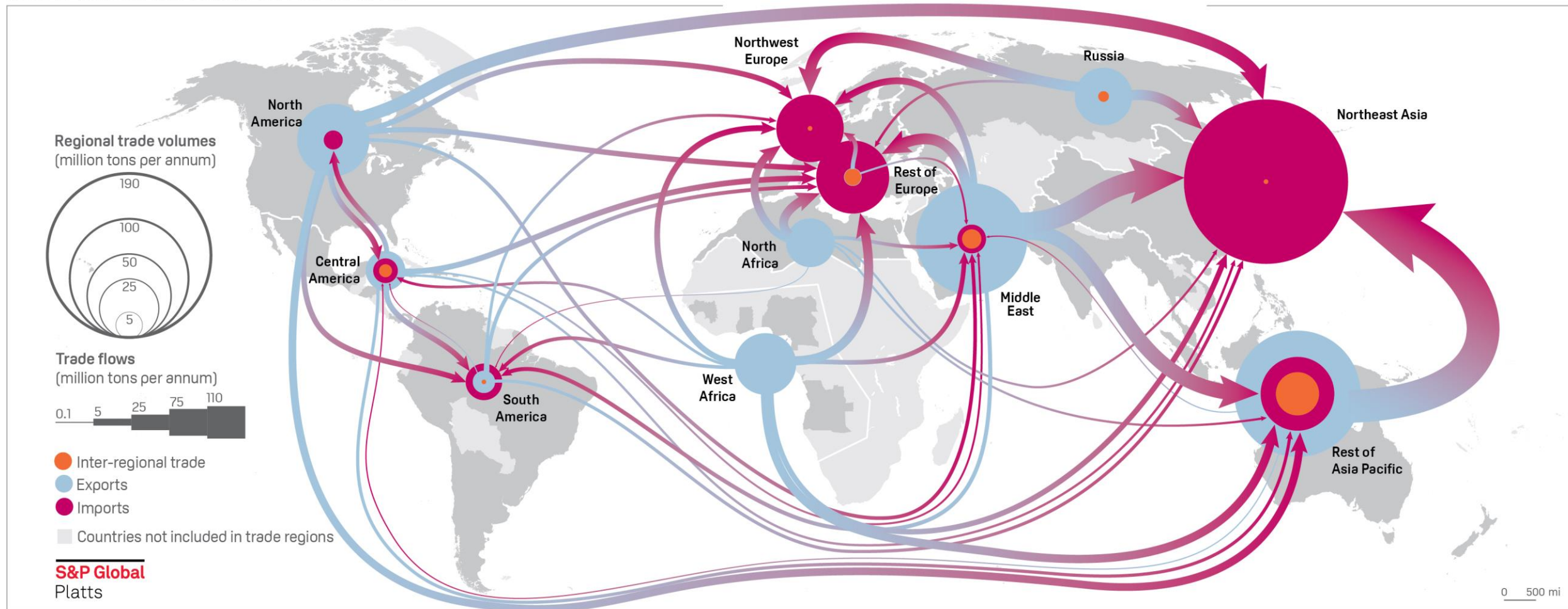
LIQUIFIED NATURAL GAS TRADE FLOW, 2018



Source: S&P Global Platts

Surging US supply will accentuate this shift into Europe in 2019 due to a weaker JKM outlook

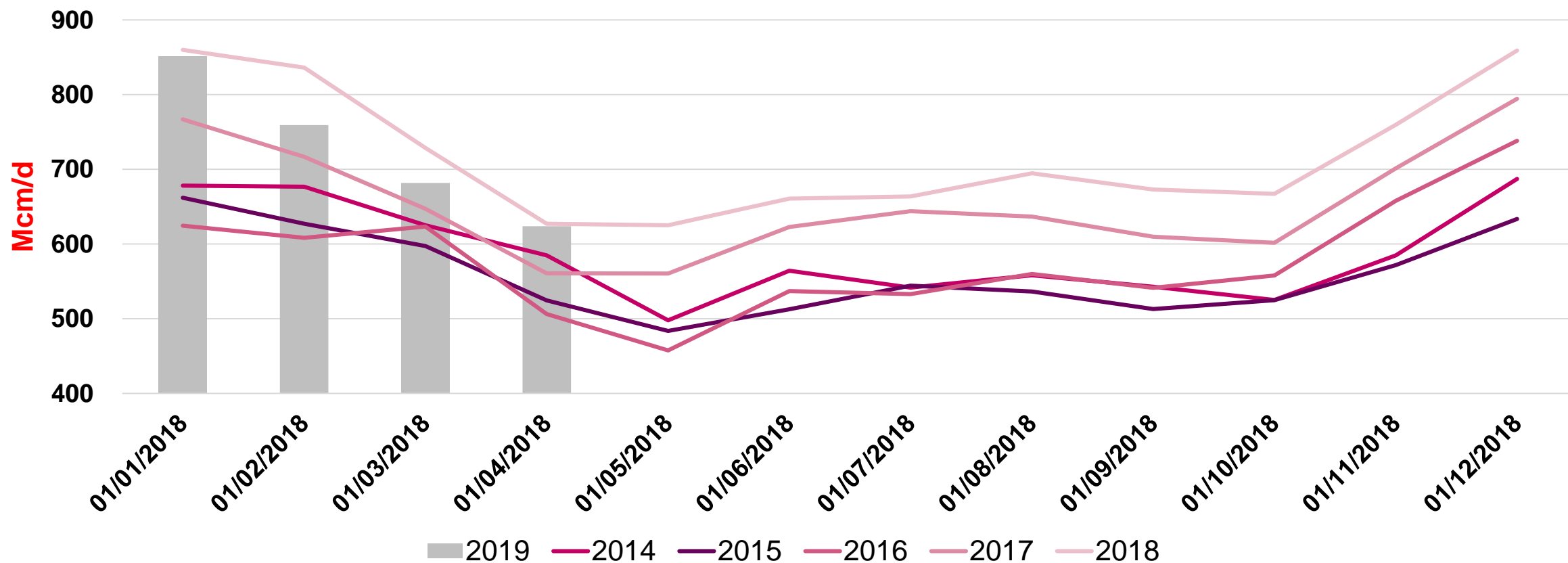
LIQUIFIED NATURAL GAS TRADE FLOW FORECAST, 2019



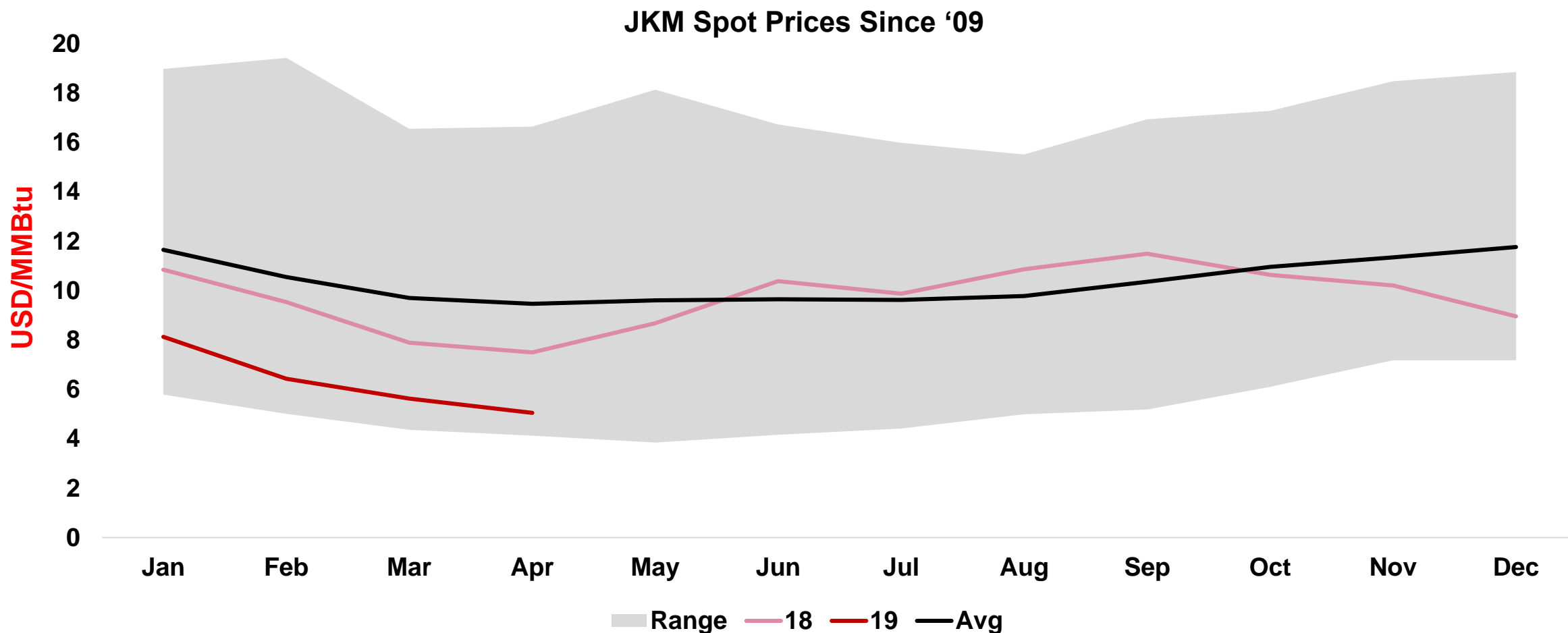
Source: S&P Global Platts

Northeast Asian imports off to a slow start for 2019, driven largely by mild weather and high storage levels

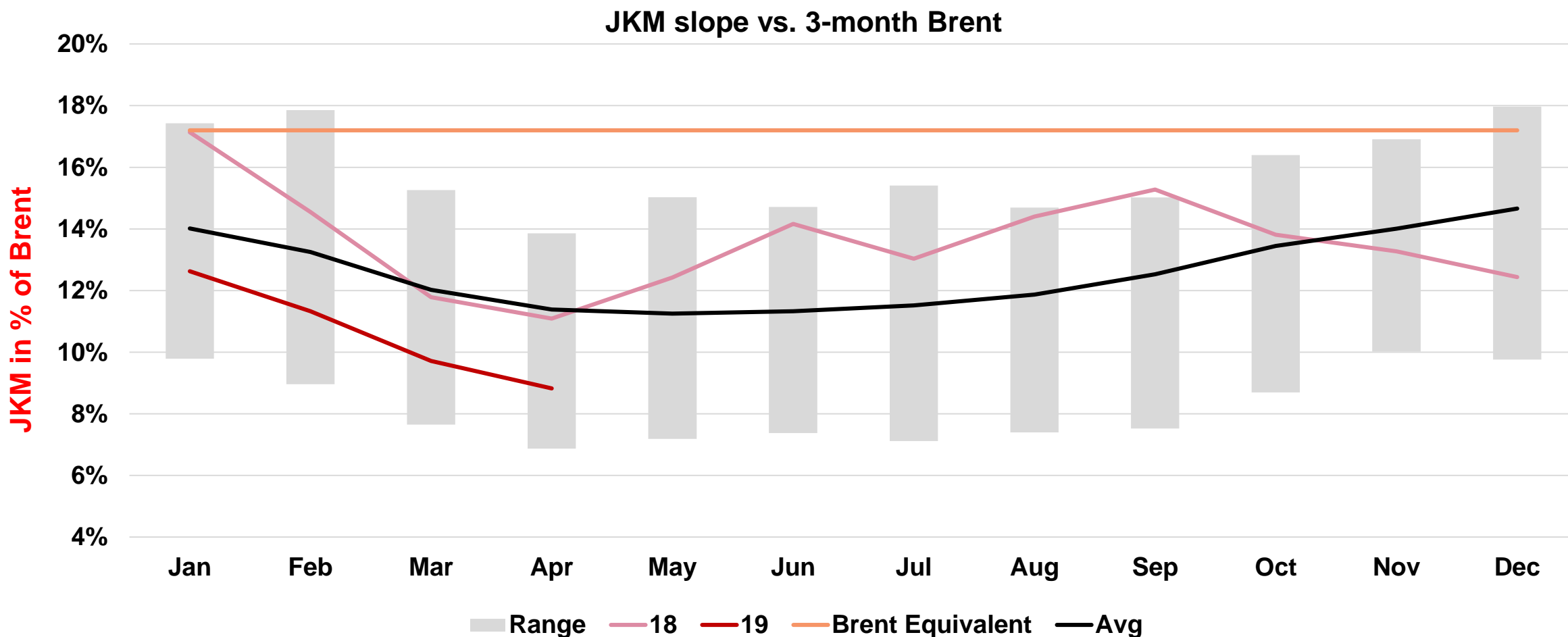
NE Asian LNG Imports



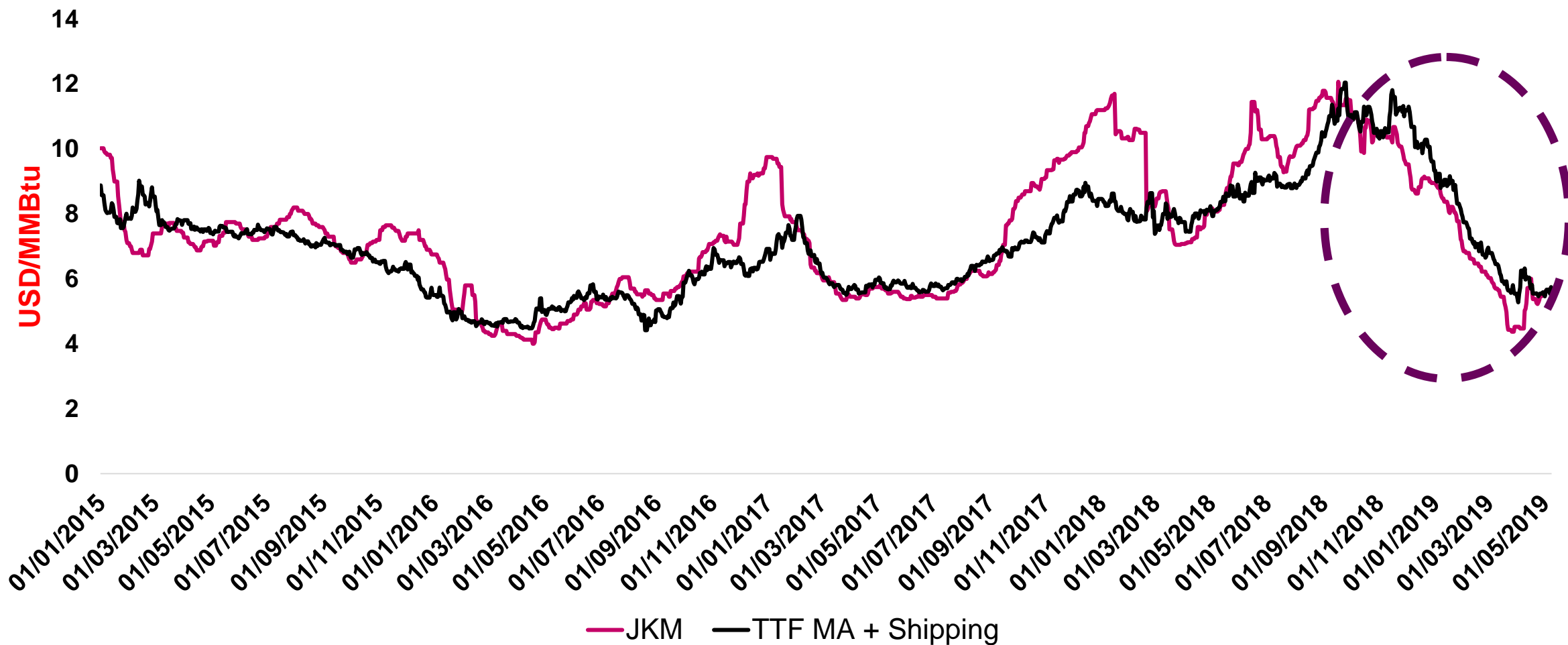
With surging supply and muted Asian demand JKM has been in freefall since Q4 2018



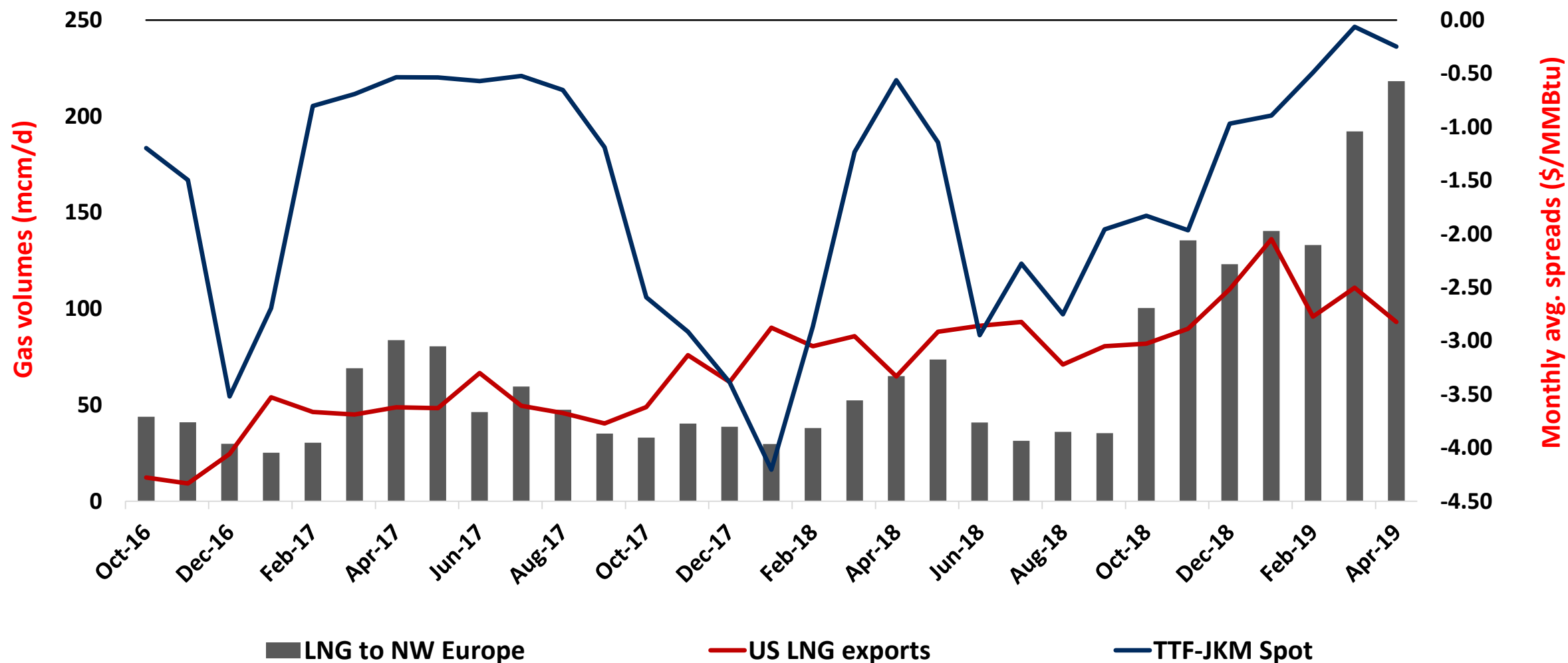
Relative pricing of JKM to Brent still most appropriate measure of market tightness...but this may change



Now JKM and TTF are chasing each other lower as growing supplies seek a home

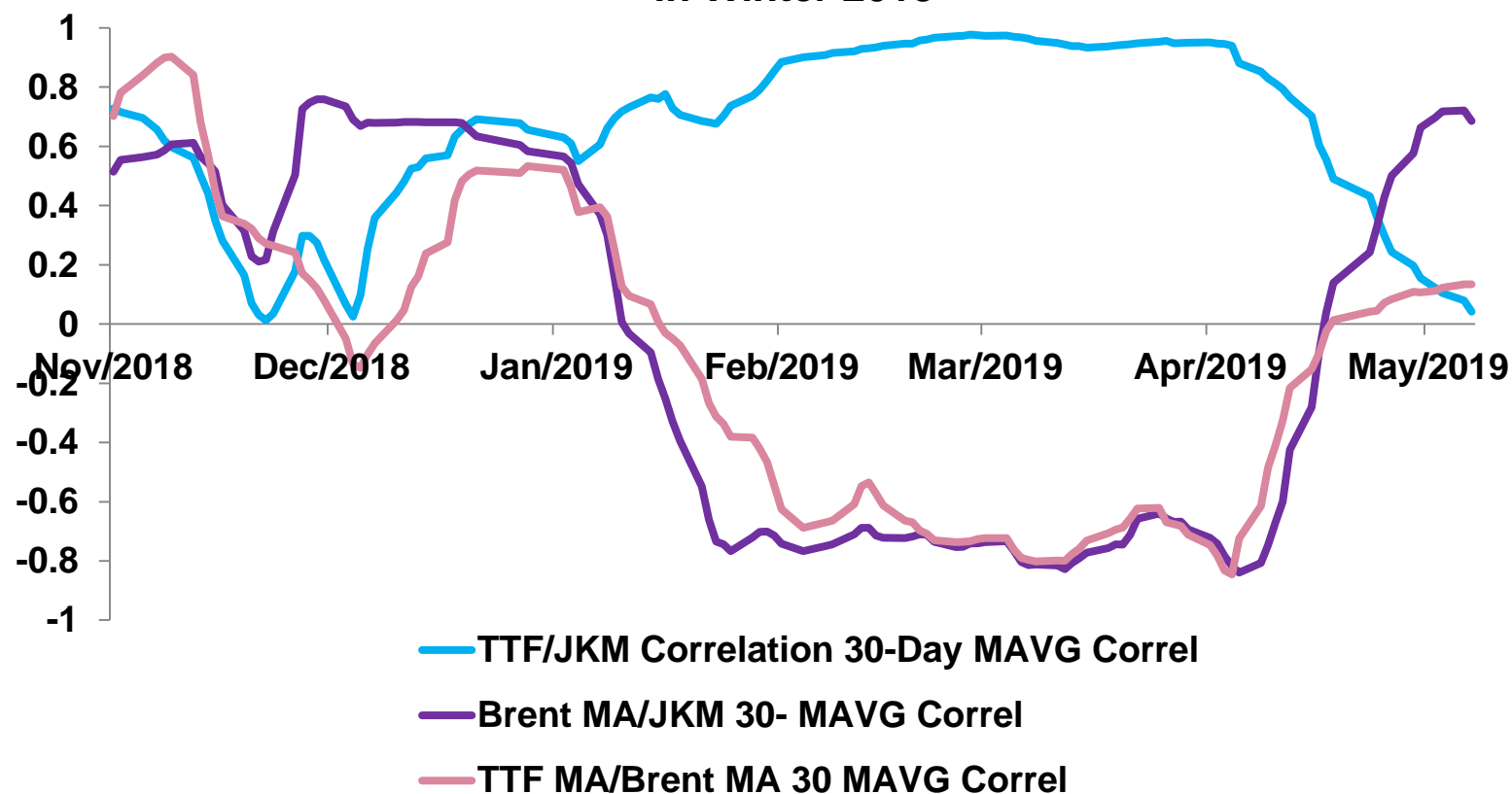


JKM briefly falls below NBP/TTF for the first time in modern era, pushing record levels of LNG to Europe



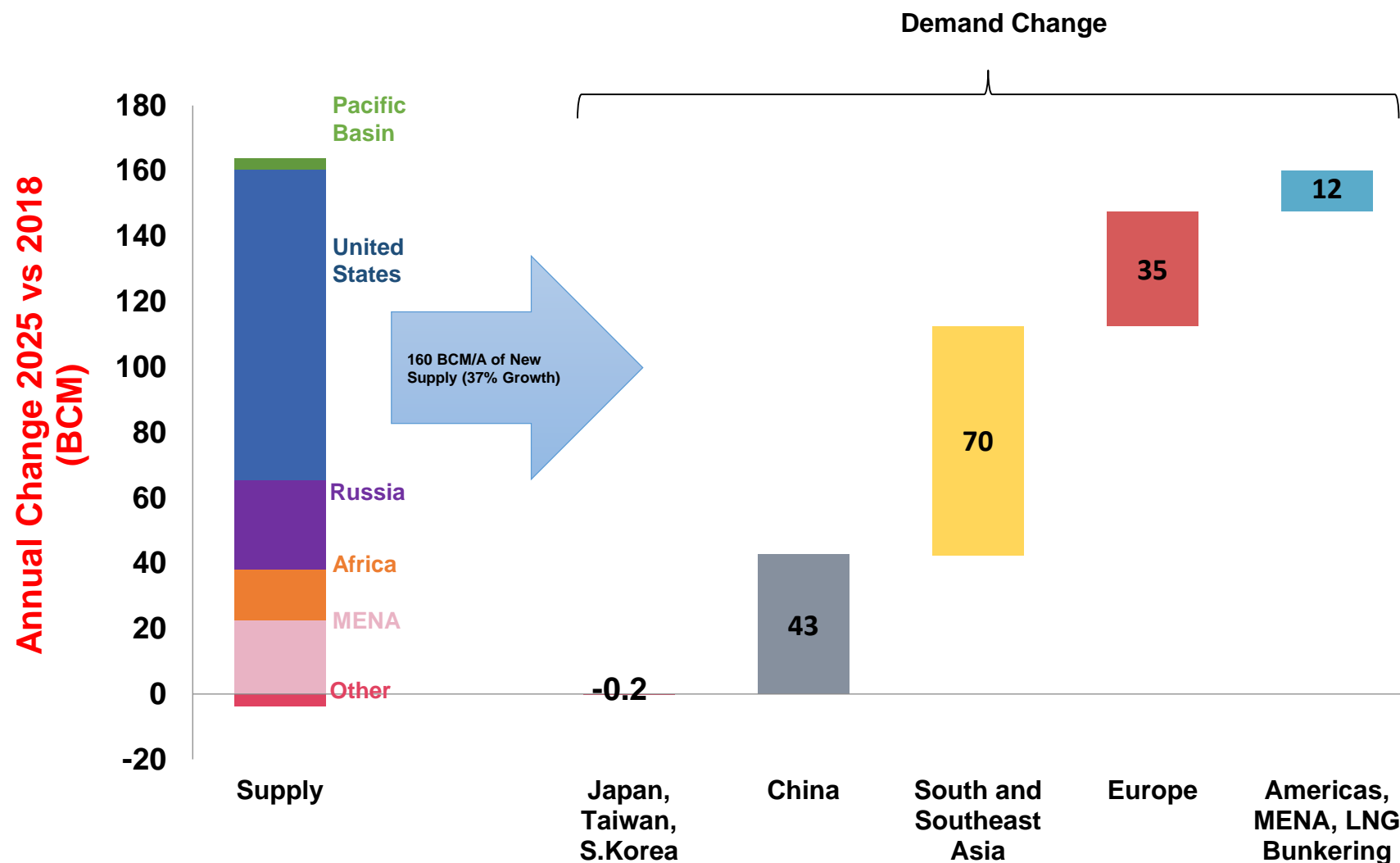
Commoditization of LNG market continues, increasingly trading on fundamentals of gas markets, not those of oil

Key Price Correlations Diverged
in Winter 2018



Historical LNG price correlations	2014-17	2018-19
Asian LNG LT Contracts vs Brent	0.96	0.75
Asian LNG LT Contracts vs JKM	0.83	0.46
Brent vs JKM	0.88	0.50
JKM vs TTF	0.45	0.88

LNG Supply/Demand Balance 2025 versus 2018



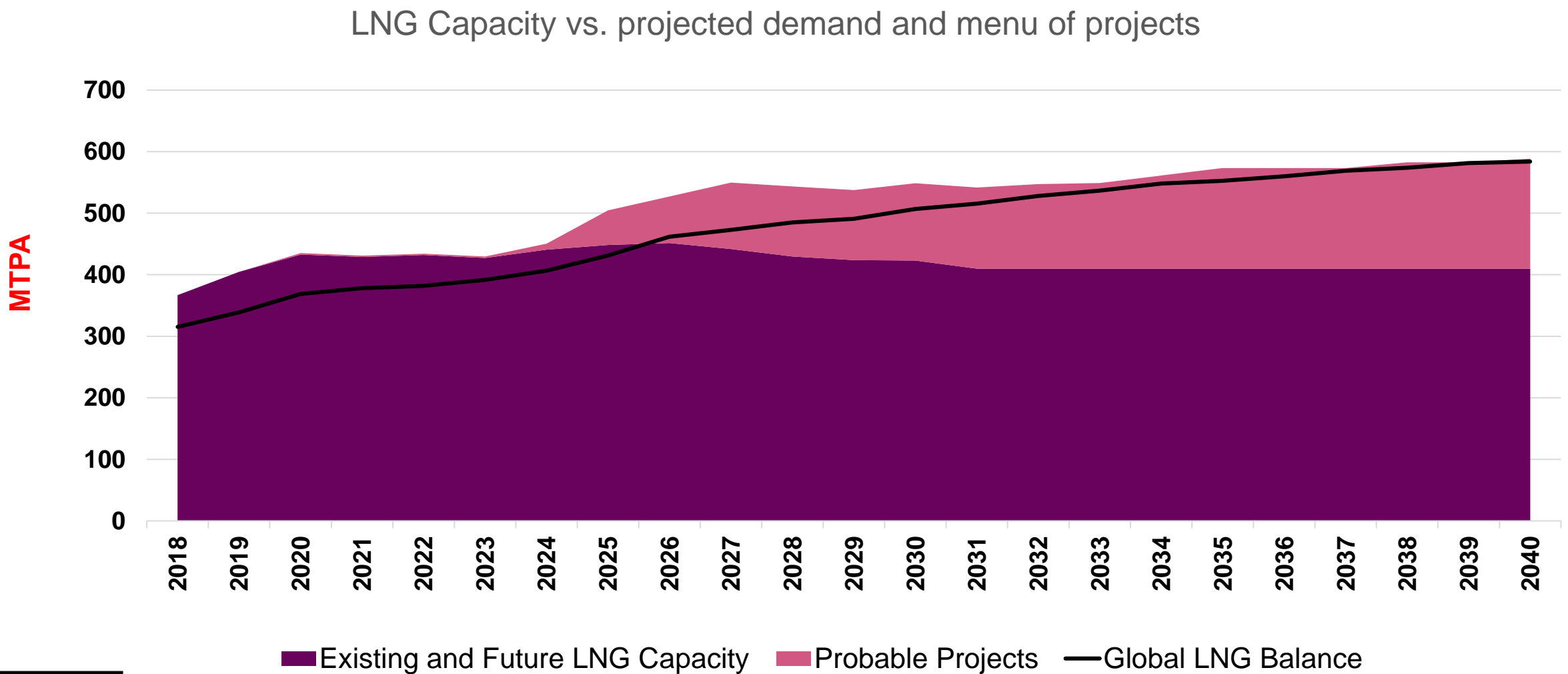
Supply Side Dynamics

- Sustained high utilization at new projects (US, RUS, PNG) meets underutilization at legacy producers (AUS, DZA, BRN)
- NOCs take larger slice of North American LNG production

Demand Side Dynamics

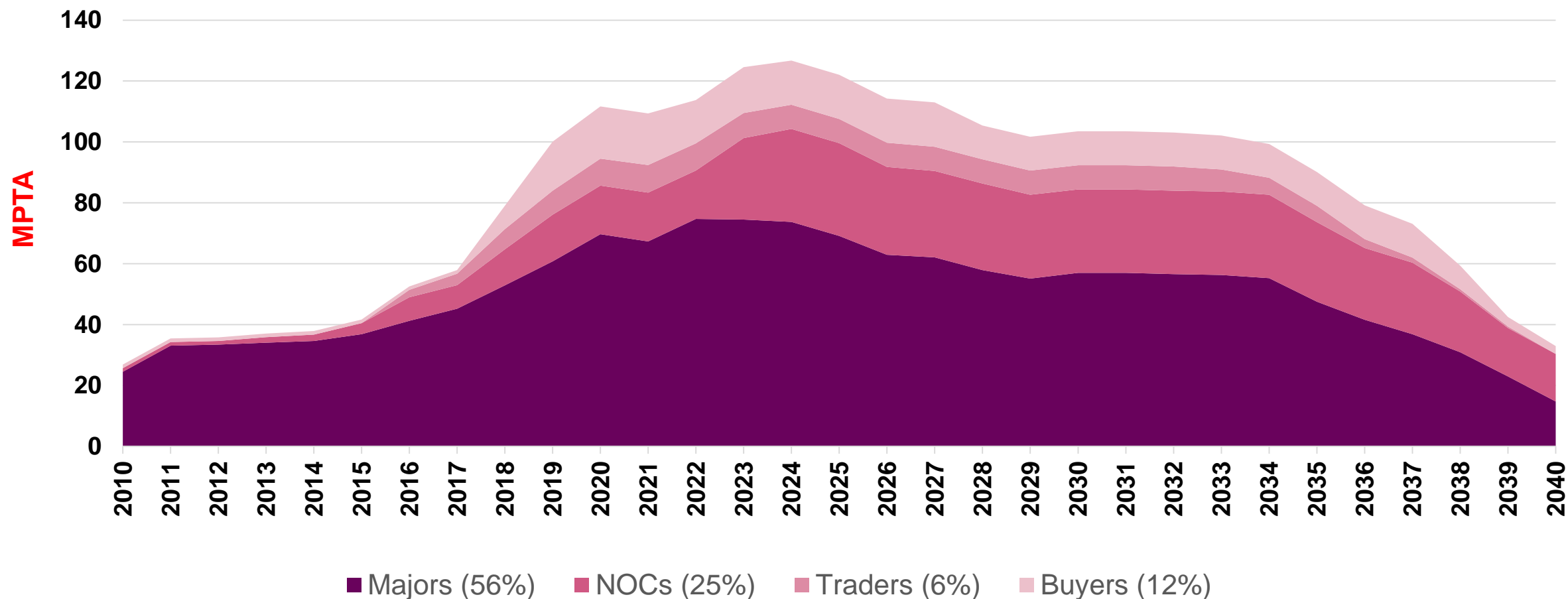
- Short term upside risk (2020-2021) in Japan, S. Korea due to nuclear delays
- Southeast Asian (IND, BGD, THA) demand hinges on infrastructure build out in long term
- Europe LNG demand offsets domestic production declines

Market growth covered by capacity through 2026; probable projects will require more aggressive pricing to build demand

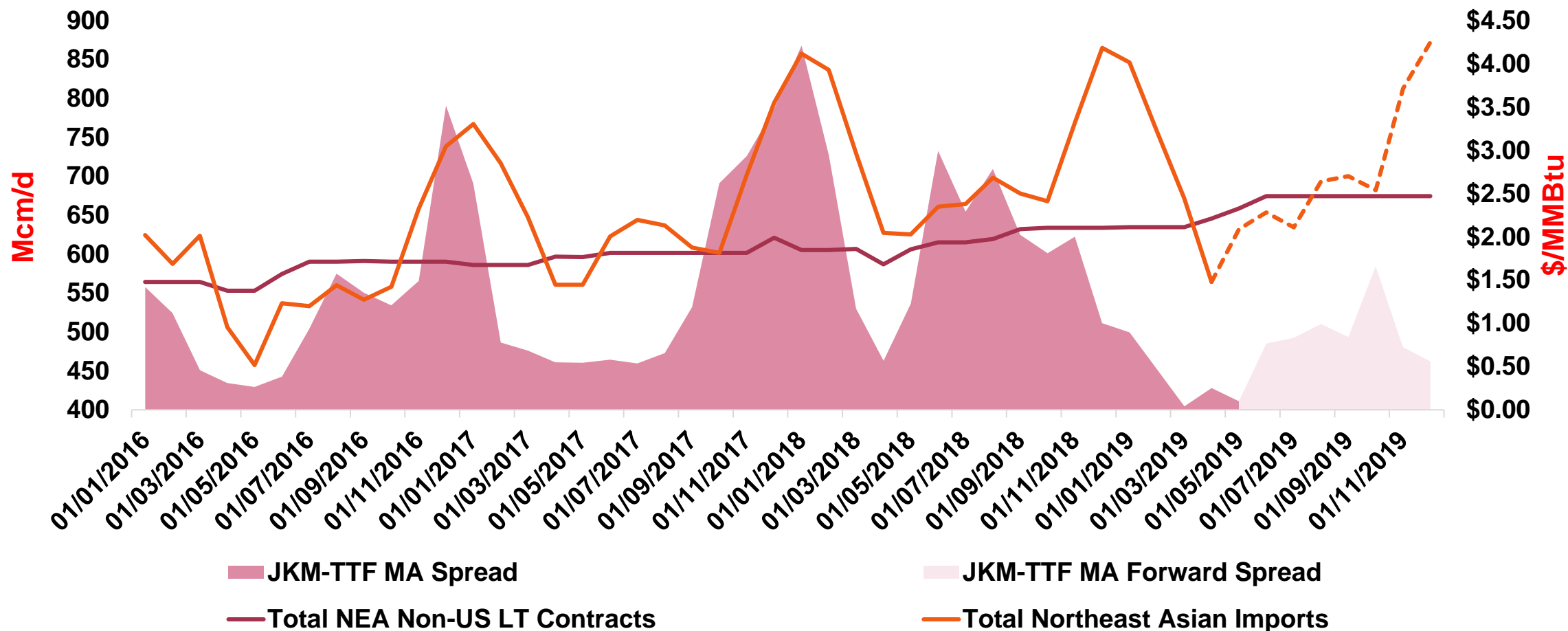


Majors/NOCs control 80% of portfolio and will dominate spot liquidity, as projects are built without end user contracts

Portfolio volumes by type of owner

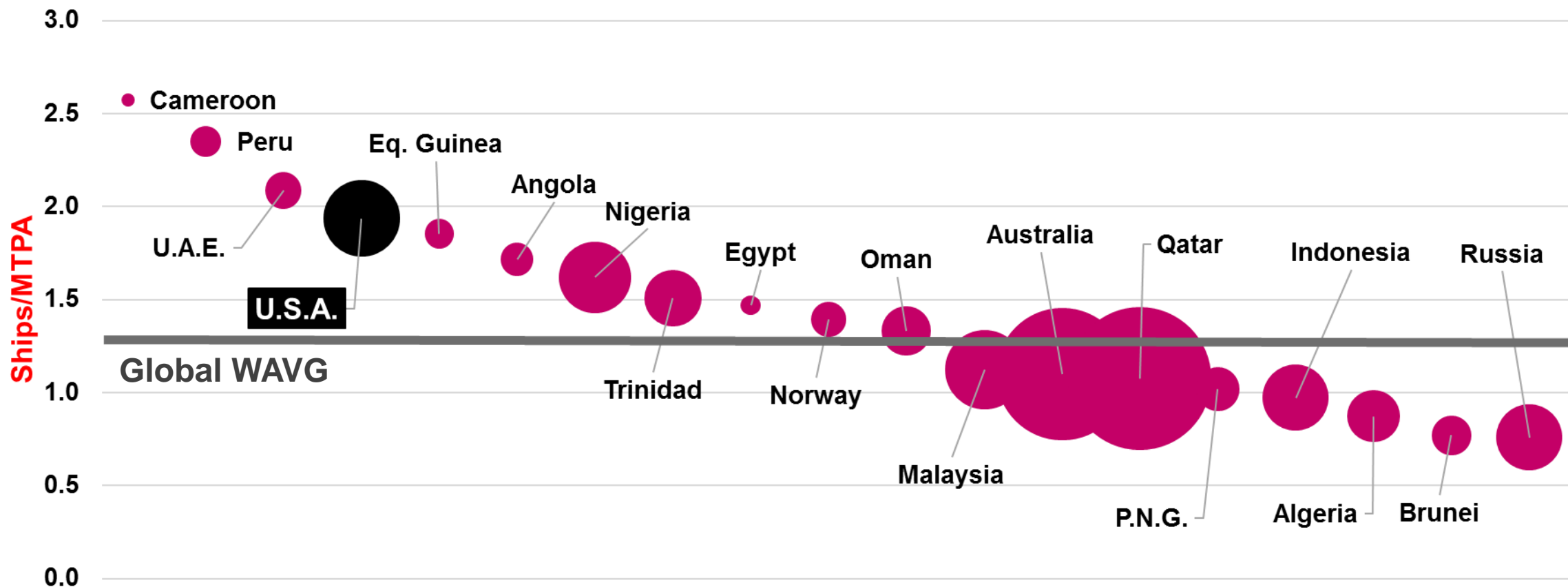


Is contracted capacity in Northeast Asia creating market inefficiency?



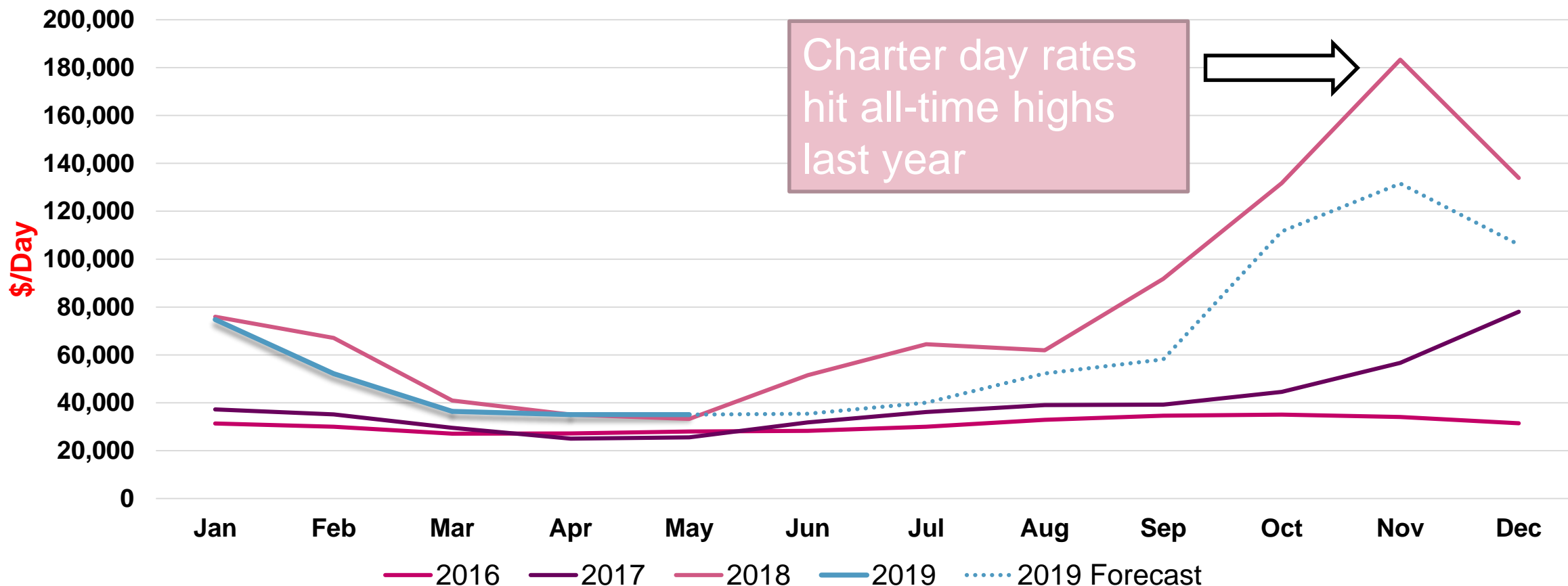
New U.S. production will shift up global shipping demand; not only because of volume, but also due to the distance to market

Ships demand by country, scaled by production

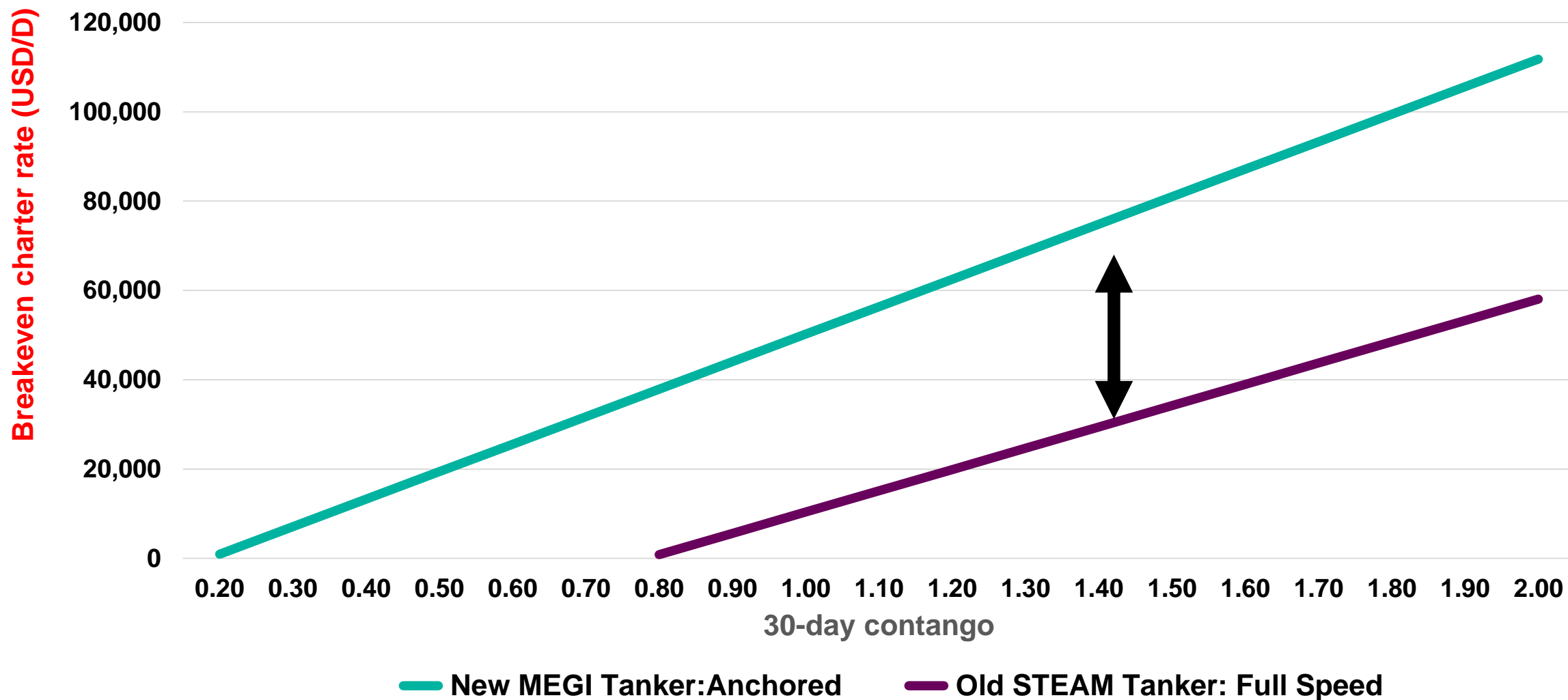


Shipping rates expected to remain stable until this winter when spreads widen and ton miles increase

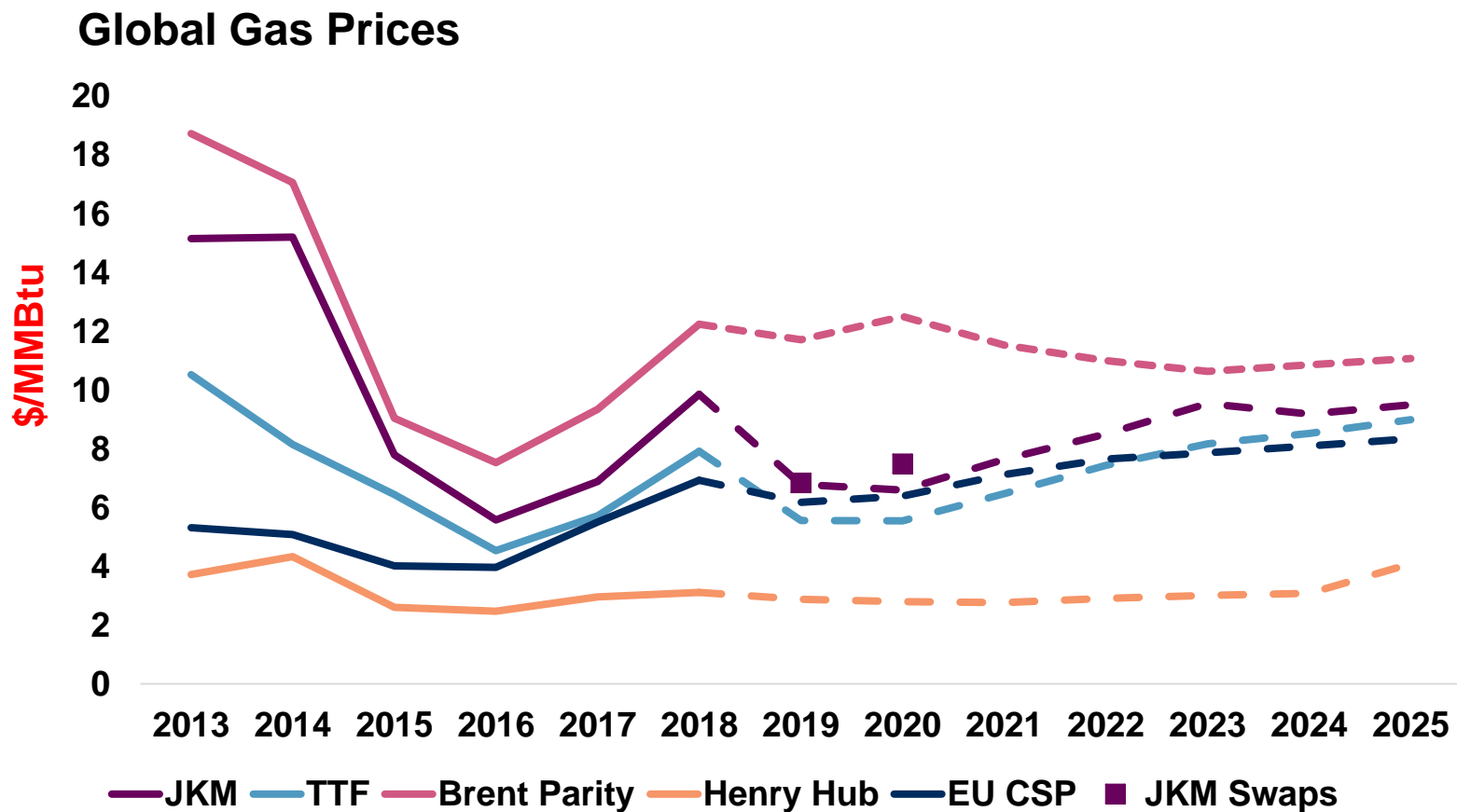
Asia Pacific LNG Carrier Day Rates and Forecast



Floating LNG storage economics: wide range of breakevens depending on technology and speed



JKM to further decouple from Brent as market becomes more liquid with freely traded, hub-indexed US liquefaction capacity



- Flexible volumes will keep the spread between European hubs and JKM around re-load economics during tighter markets (2020-2022)
- Periods of large supply growth will catalyze convergence beyond shipping economics (2023-2025)
- Convergence below \$8/MMBtu could drive demand creation
- Downside risk to price convergence could arise from oil-price stickiness in Asia

Decisions in the digital age?

Analytics is the answer.