



Navigate Global Propane Markets

Impact of COVID-19 on Global Supply & Demand



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Global Market Outlooks

Crude Oil	Fuels	Refining	NGLs
Green Energy Trends & Biofuels	LNG	IMO 2020 Bunker & Trade	

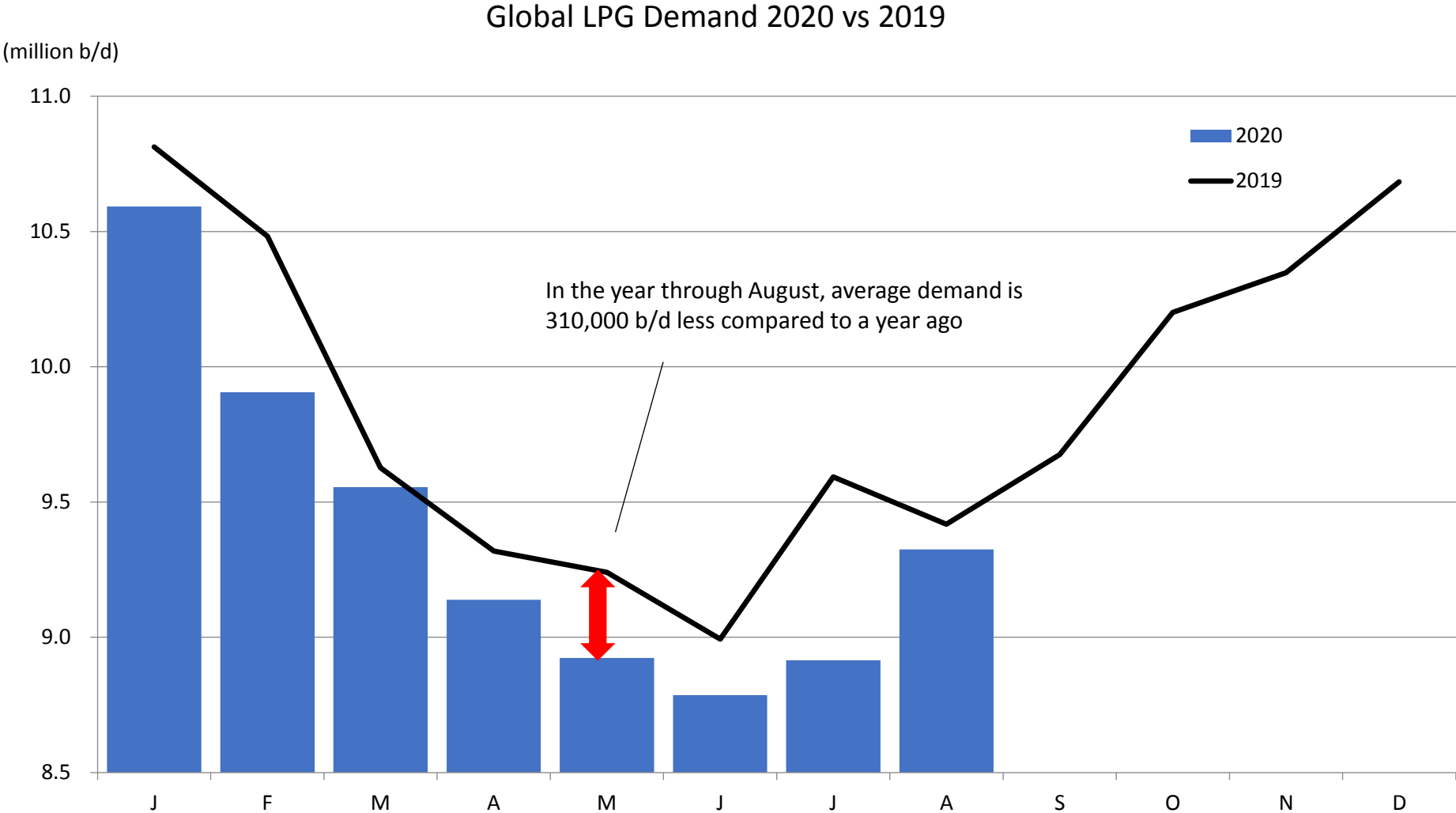
Today's Presentation



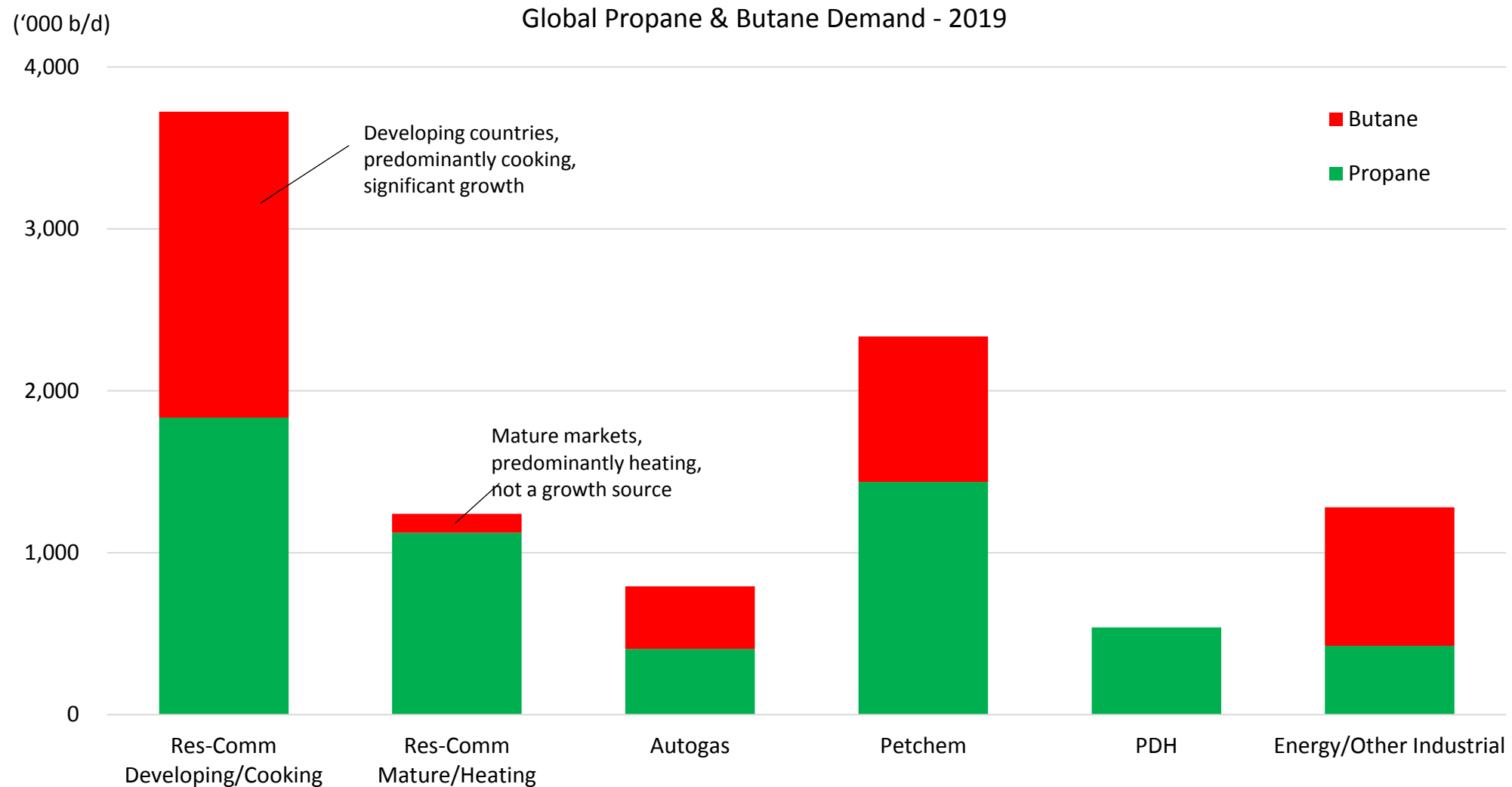
What is the short-term outlook for the recovery of demand & supply?

What are the implications for fundamentals & pricing?

Global demand fell 300,000 b/d in the year-to-date



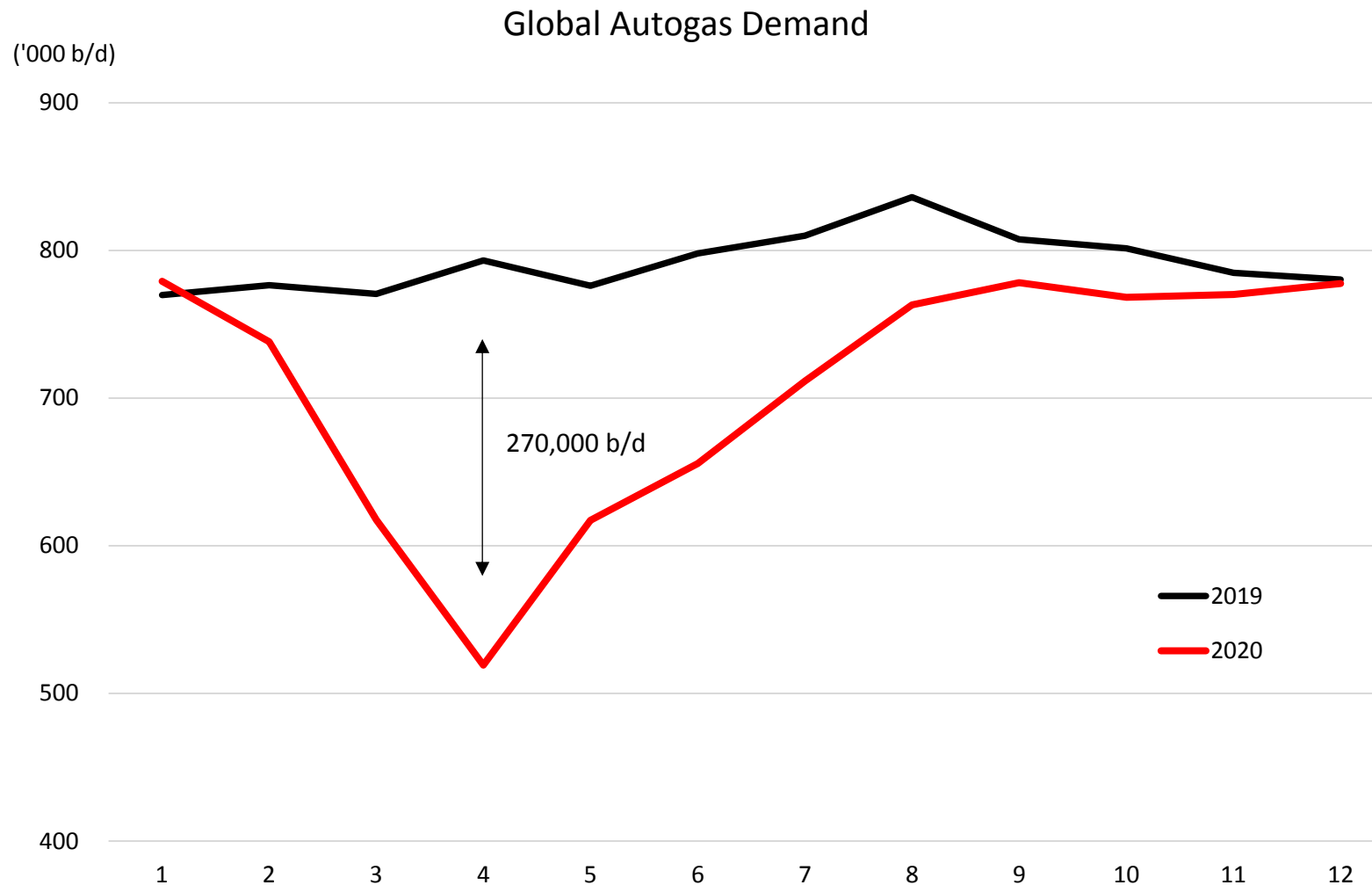
Understanding & forecasting demand requires a sector-by-sector approach



Transport: Autogas & Related Demand



Transport: Autogas contributed to demand's collapse but has made a comeback

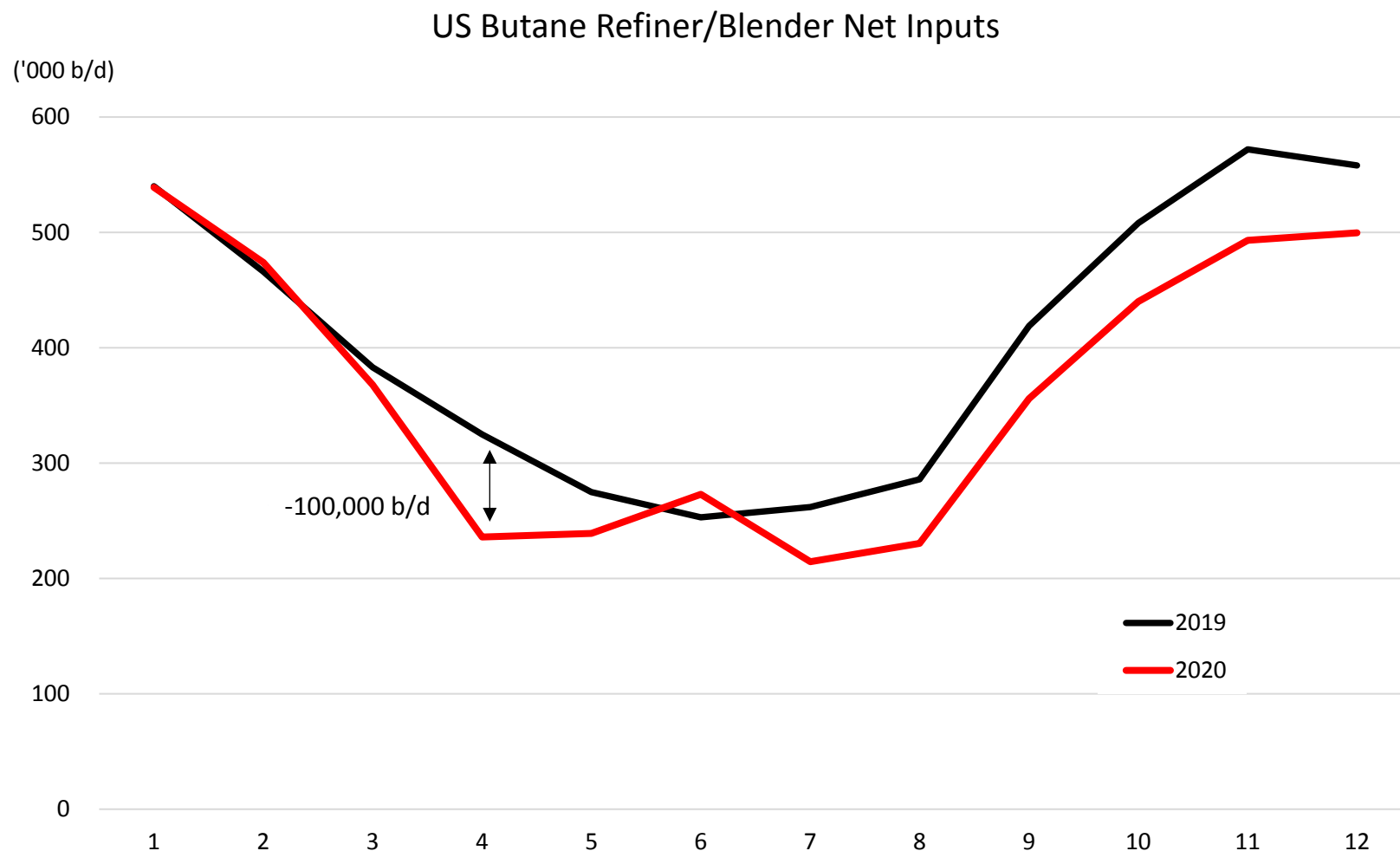


Temporary loss of 33% of Autogas

Decrease in Autogas use was a major contributor to the decrease in demand

Autogas demand largely recovers by 4th quarter

Transport: Less butane inputs for US gasoline production



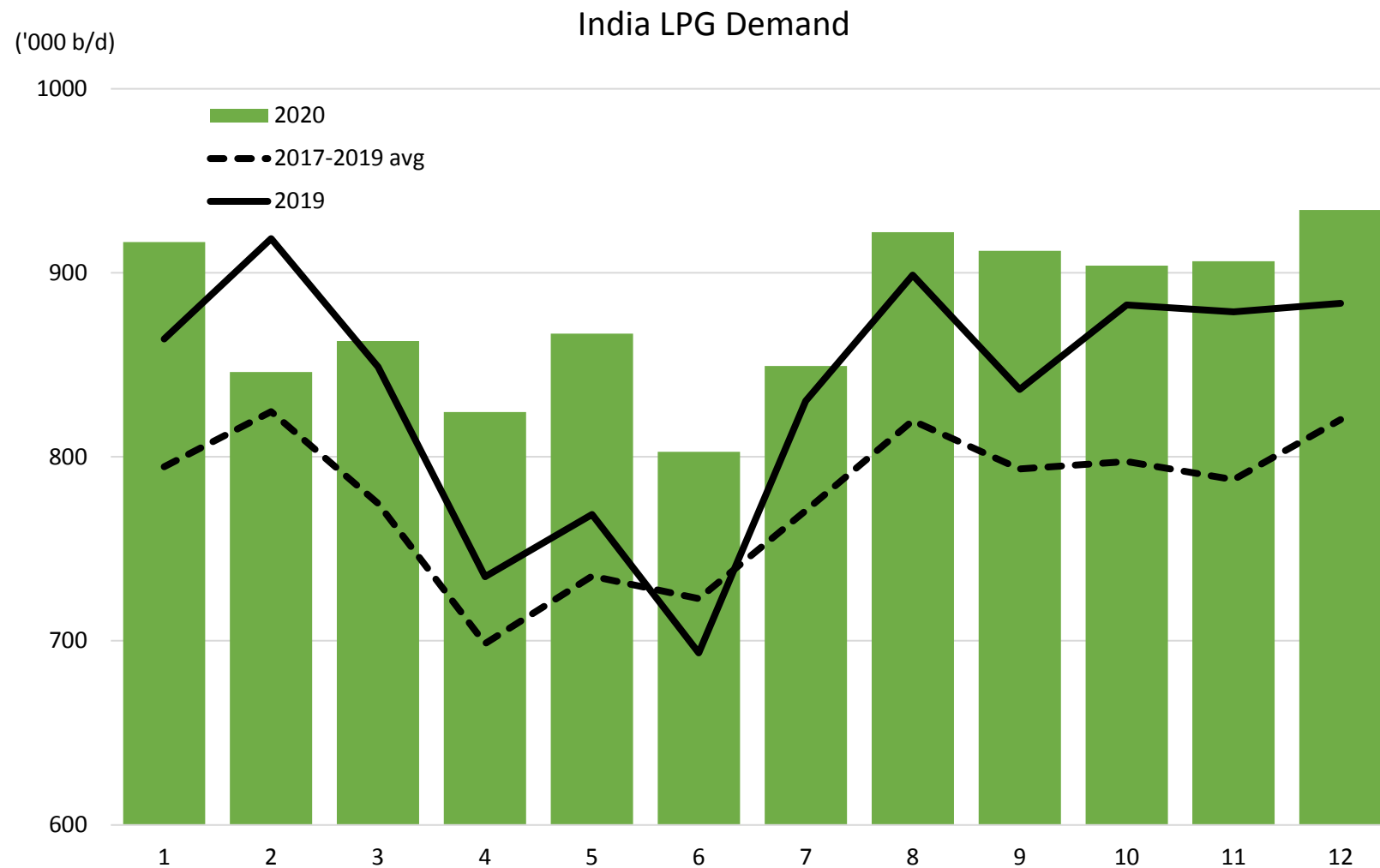
US produces 1/3 of world's gasoline, with 400,000 b/d of net butane inputs into refineries

Lost 100,000 b/d of demand in April

Between Autogas and US butane inputs to gasoline production, by 4th quarter the demand loss narrows to 50,000 b/d

Developing Country Res/Comm Demand



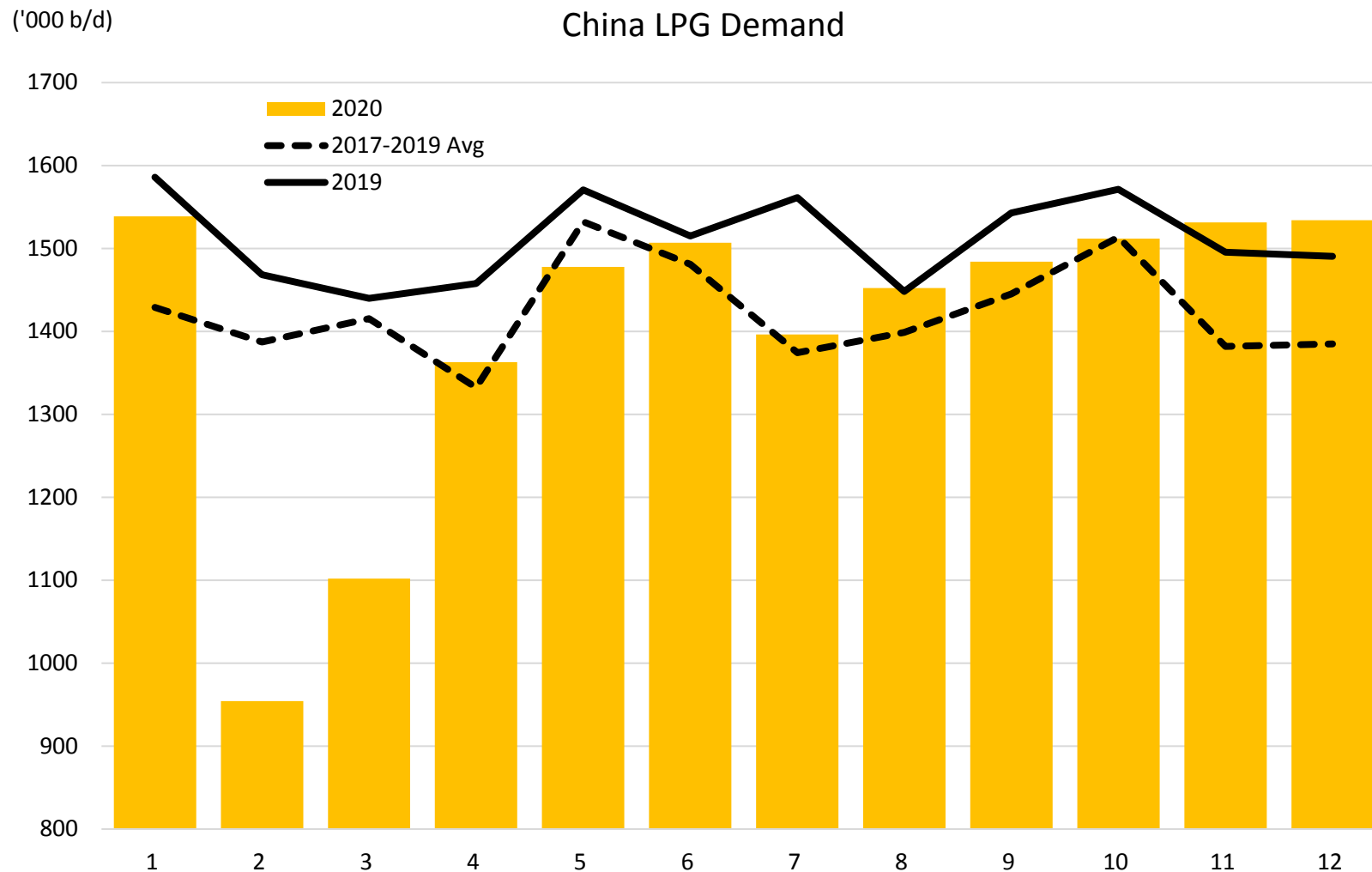


India's annual growth averaged 50,000 b/d in past 6 years

During pandemic, 80 million households can refill cylinders free of charge once per month, initially in 2nd quarter but extended to third quarter.

In April-June, year-on-year growth was exceptionally high 100,000 b/d

Demand growth is forecast to revert to a "business-as-usual" pace



China's implied demand fell by one third, or 500,000 b/d, in February-March, then in the 2nd quarter was 170,000 b/d lower compared to a year ago.

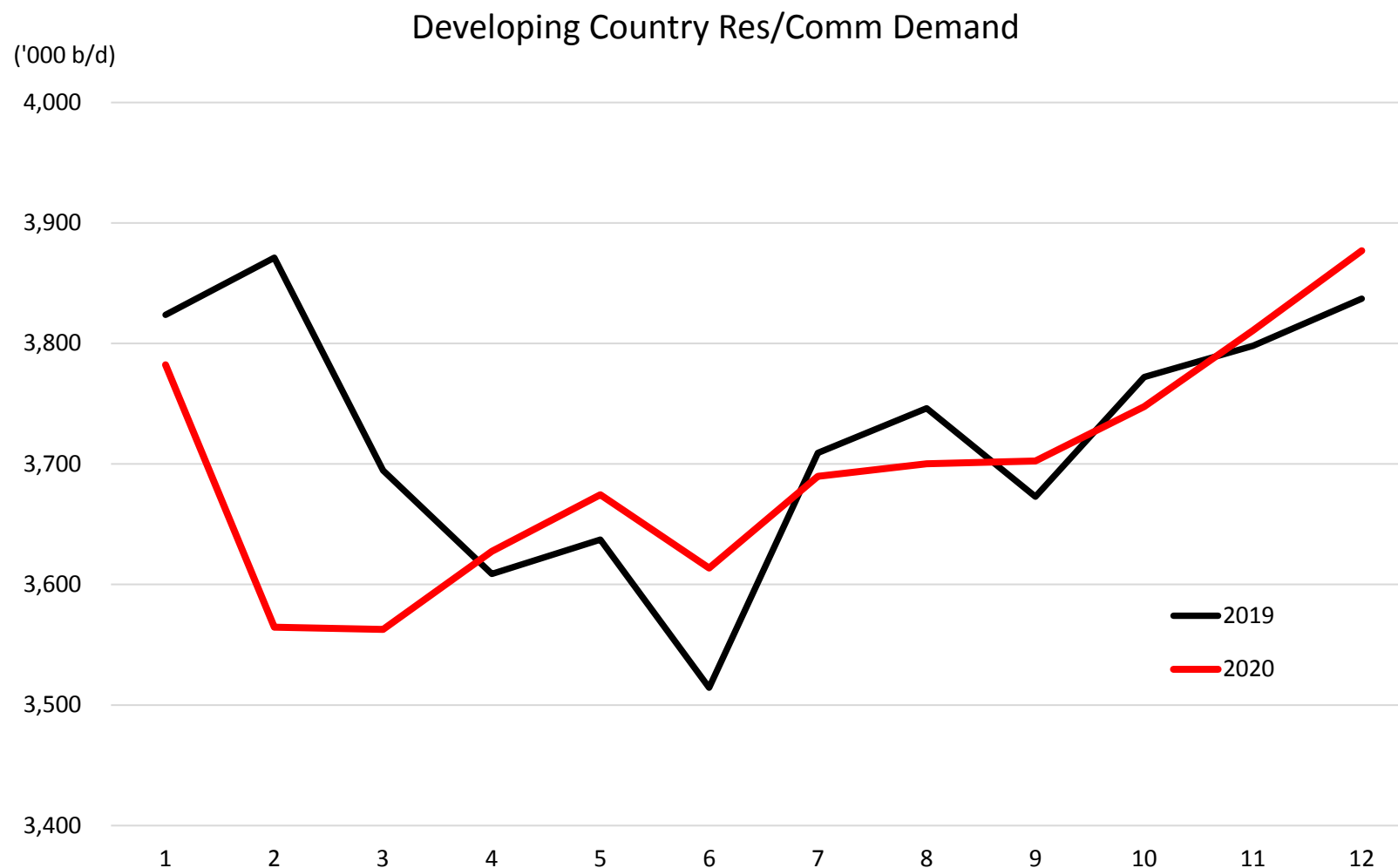
Reduced refinery supply leads to decreased inland distribution for res/comm use, contributed to lower demand.

Commercial use took a big hit, envision less than a full recovery

This summer, flooding undermined the demand recovery

Residential/commercial demand will only make a partial recovery, PDH/petchem sectors are the leading reason demand is projected to strengthen in late 2020

Res/Comm: Developing country demand has fully recovered



In 1st quarter, disruptions in China and lull in Indian demand led to sharp year-on-year decrease

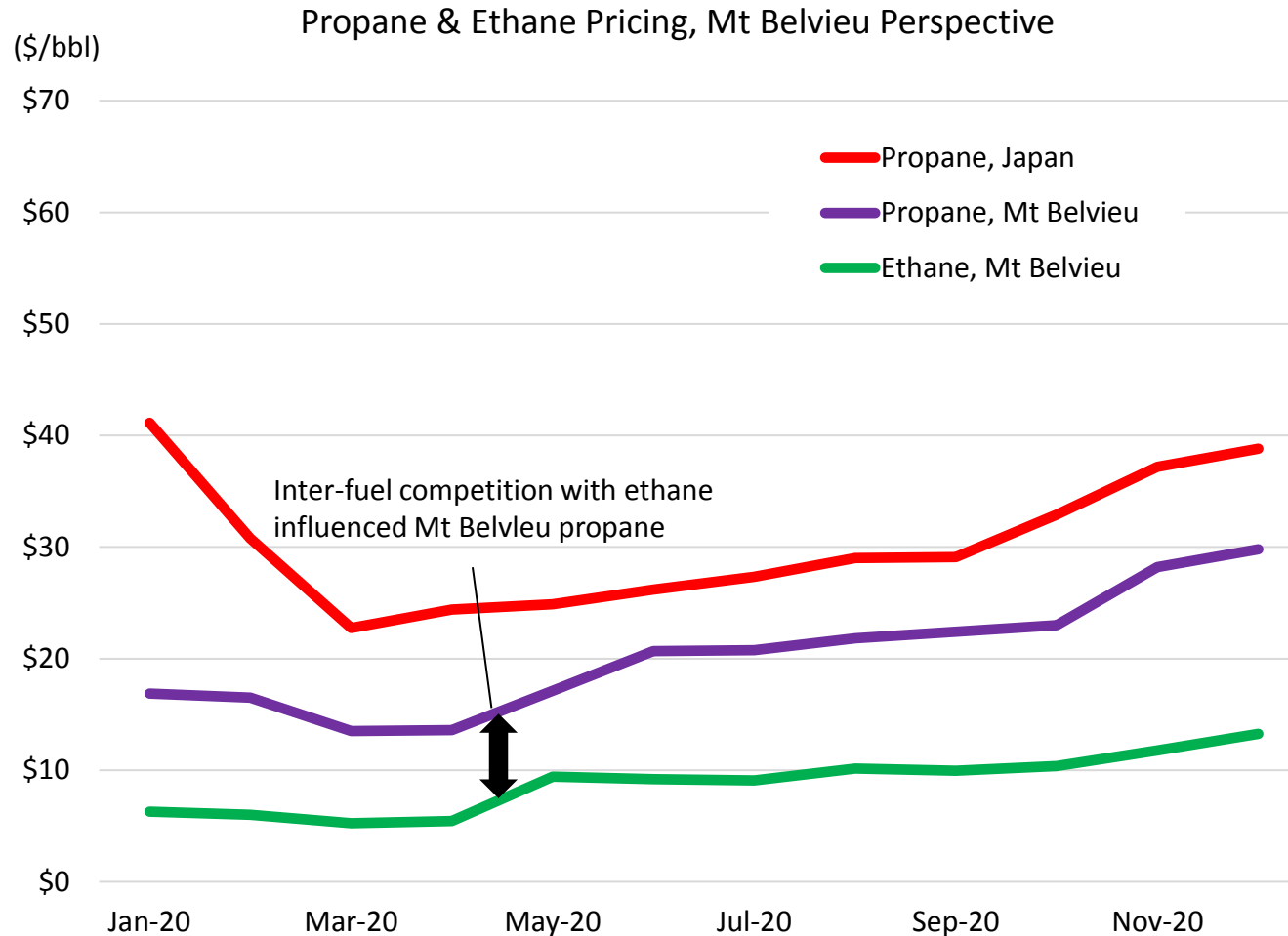
In 2nd quarter, extraordinary growth in India led to year-on-year growth

For balance of 2020, we expect demand to be even with 2019 levels

Pricing: Propane- Naphtha Spread



Pricing: Gas-linked pricing provided temporary anchor to propane



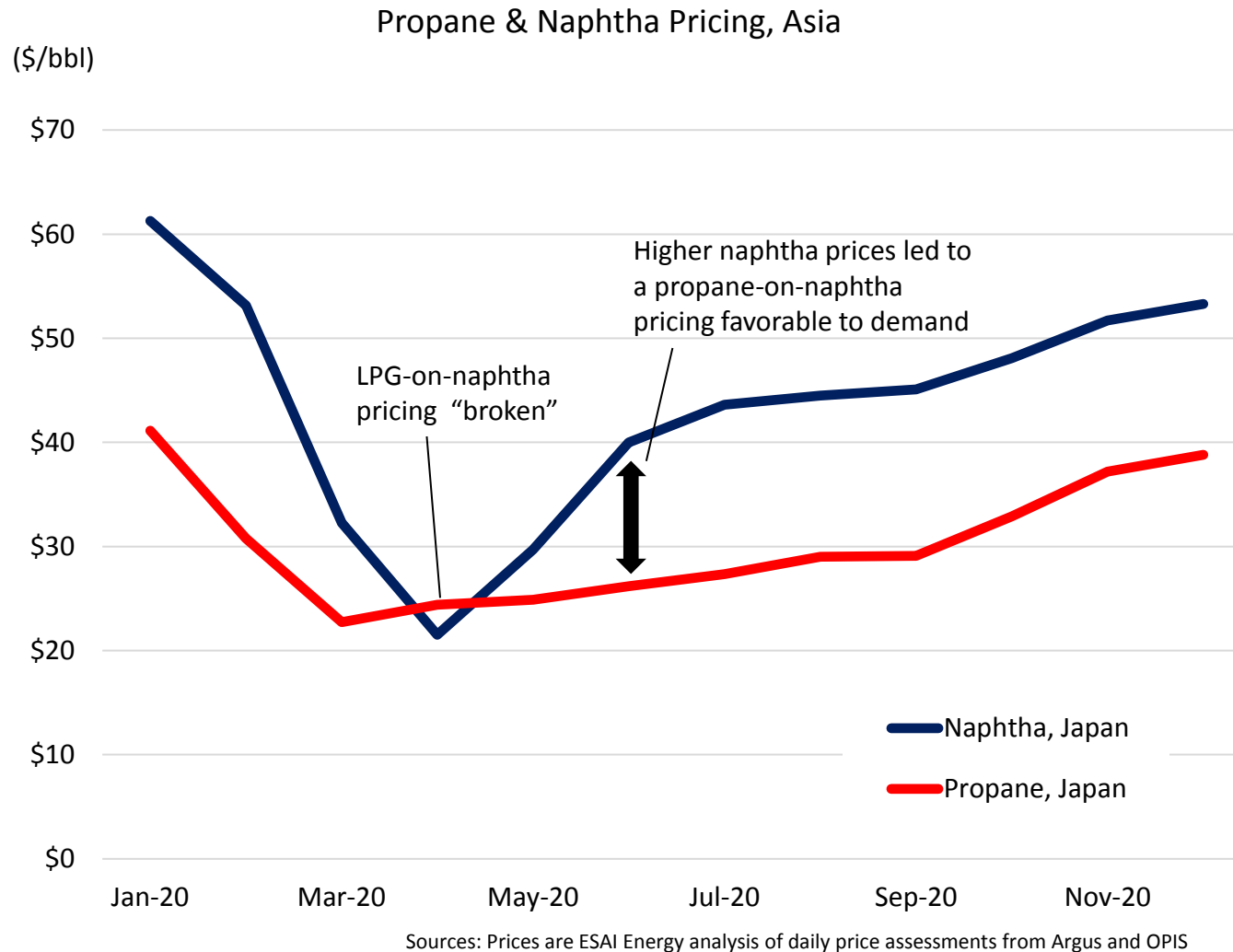
Sources: Prices are ESAI Energy analysis of daily price assessments from Argus and OPIS

Propane temporarily stopped behaving like an oil-linked product - when oil prices fell, propane prices in Asia found a price floor in the low \$20s

Instead, propane found a new “compass” in ethane, a gas-linked product – an increase in ethane prices and strong propane-ethane price interaction are evidence of this change

International propane prices were loosely based on a Belvieu + transport

Pricing: LPG is pricing competitively into naphtha crackers again



Inter-fuel competition at naphtha crackers in Asia and Europe is an important mechanism for interaction between demand and pricing

In April, propane flipped to a premium and provided a strong disincentive to demand

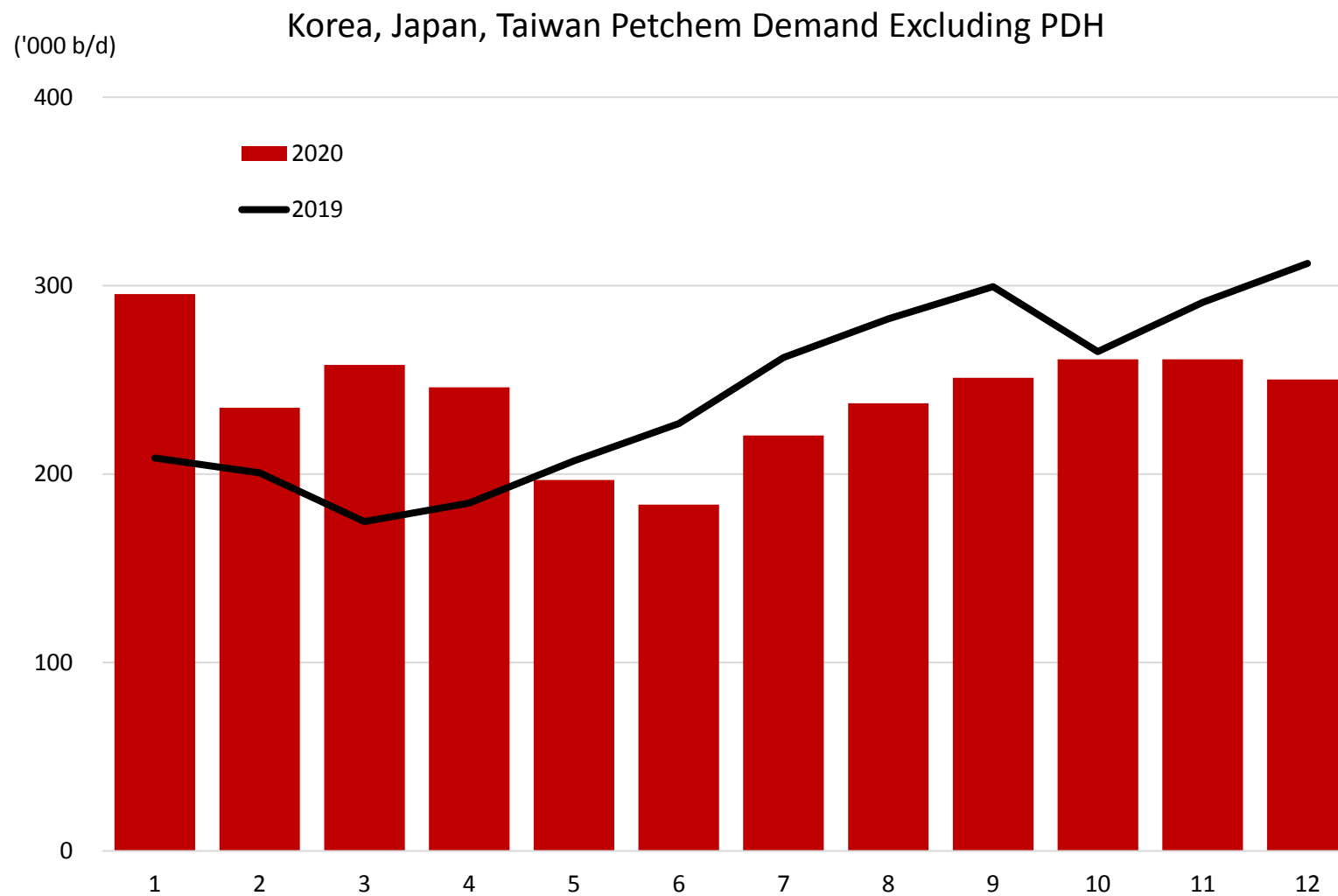
This summer, naphtha prices rose to the \$40s and the naphtha/propane differential is encouraging demand at naphtha crackers

Our short-term assumption is naphtha prices creep higher and propane maintains a wide enough discount to encourage petchem demand

Petchem: Naphtha Crackers & PDH



Petchem: Worst is over for naphtha crackers in Asia & Europe



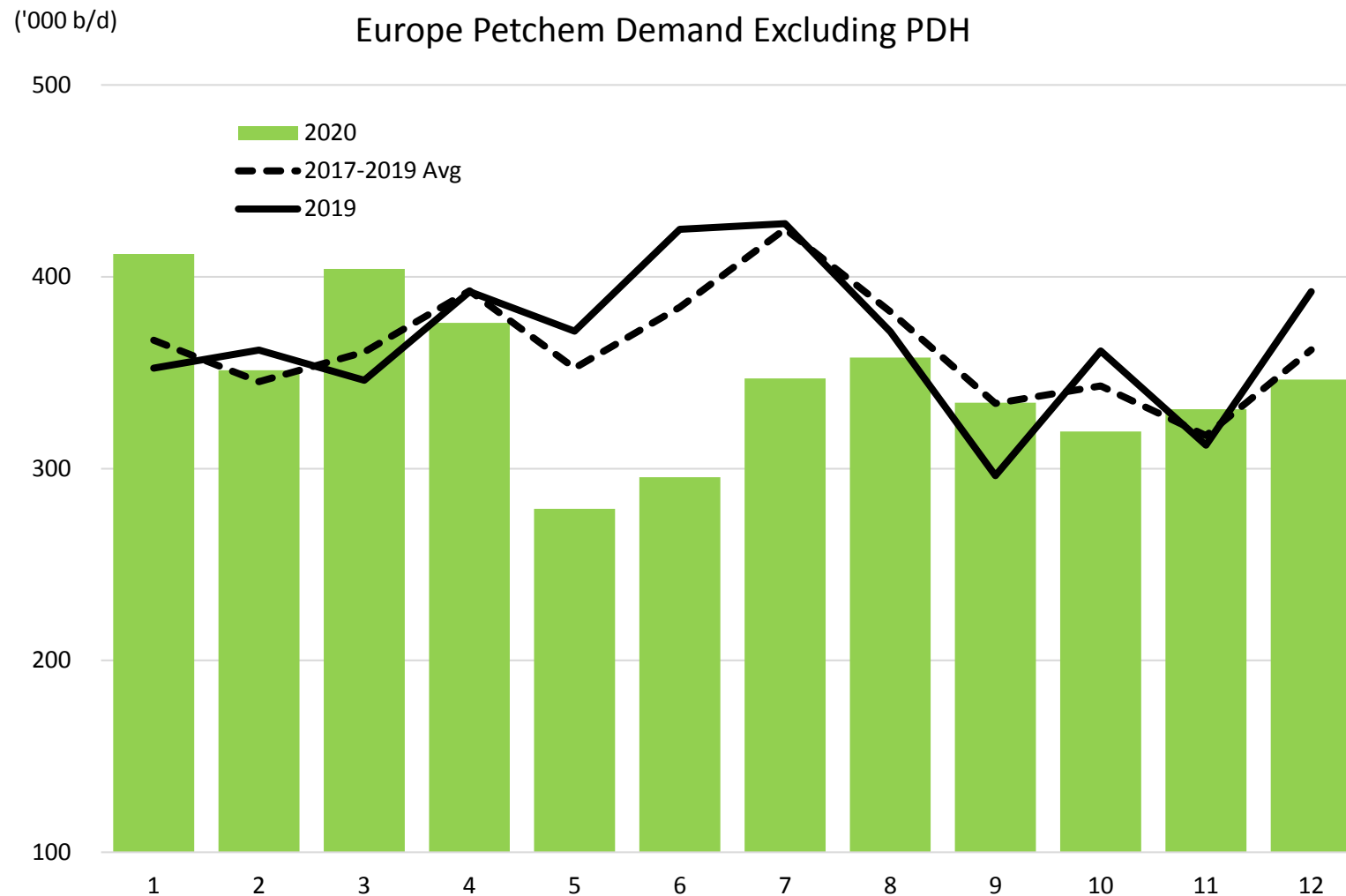
Korea is the growth market, its demand soared after mid-2019 investment enabling more propane cracking

Due to uncompetitive LPG pricing and disruptions to economic activity, demand collapsed in May-June.

In 3rd quarter, supported in part by more competitive LPG pricing, demand began to recover

Due to headwinds, in late 2020 we assume demand will not match last year's record high.

Petchem: Similar trend at naphtha crackers in Europe



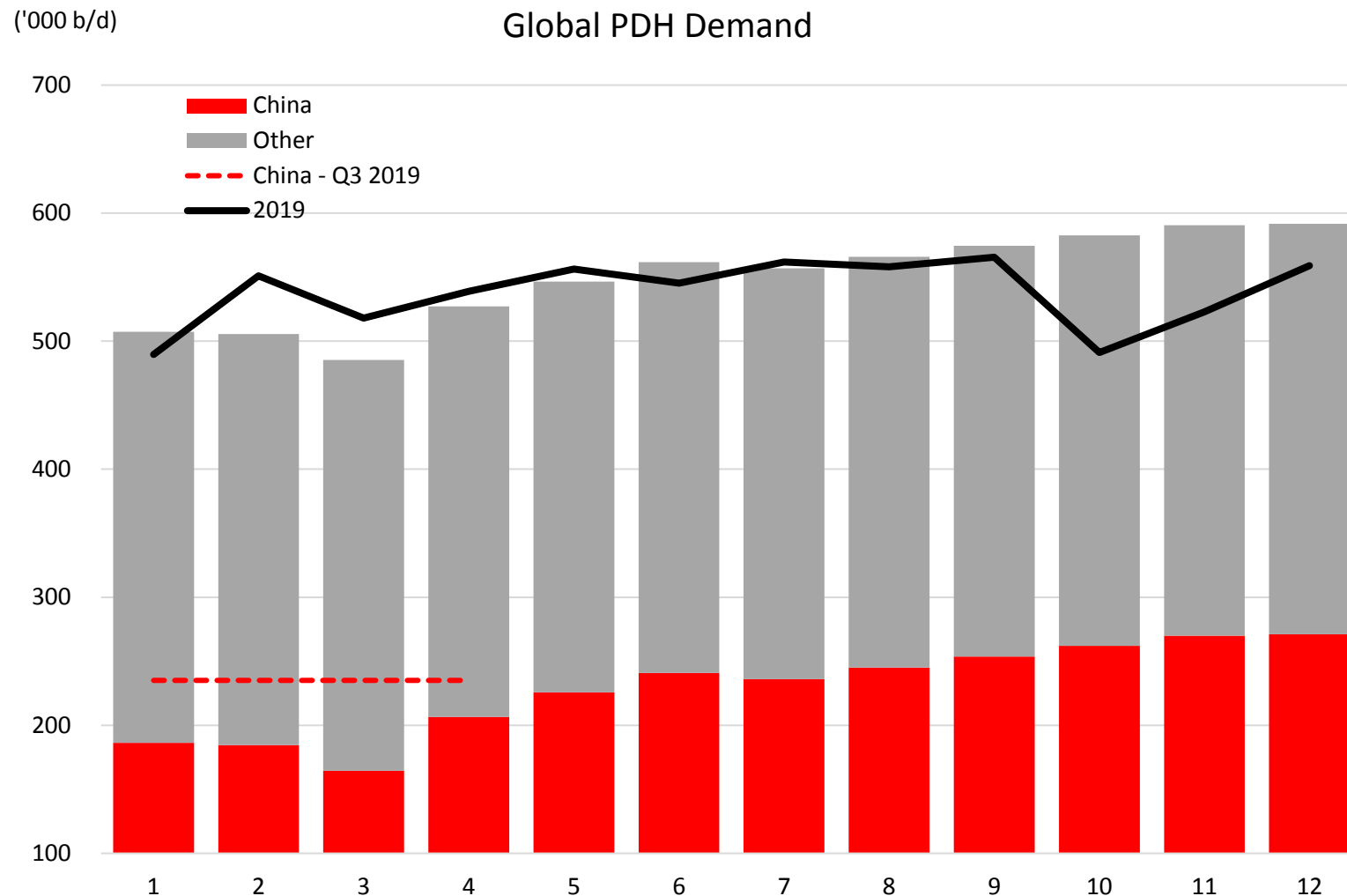
Developments in Europe are similar to North Asia

Demand collapsed in May and June

Demand is assumed to have recovered in the third quarter

For the balance of 2020, demand is projected to nearly match end-2019 levels

PDH: China is contributor to early-2020 weakness, late-2020 strength



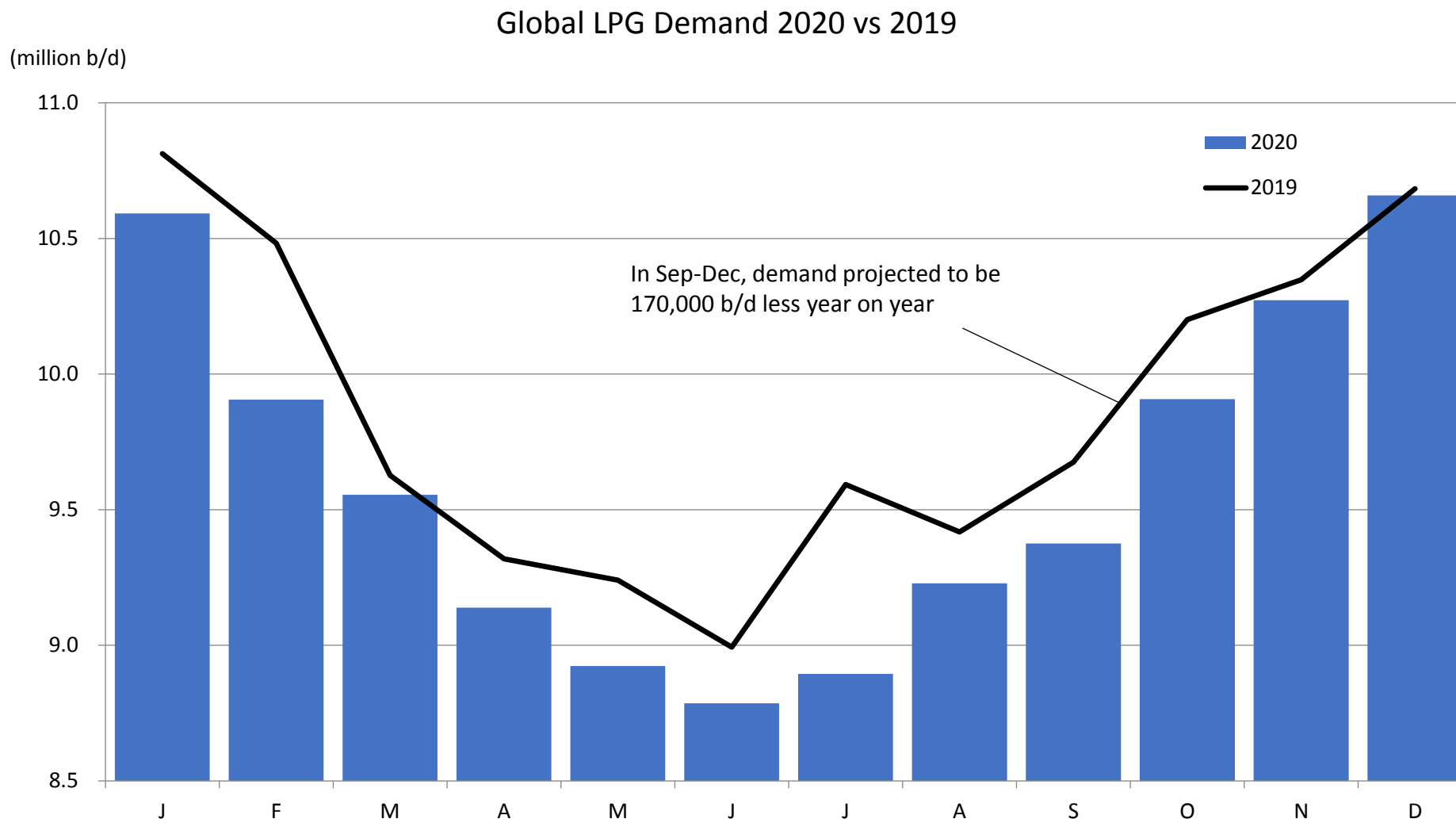
5-year average for annual global growth is 60,000 b/d, including 50,000 b/d in 2019

In late 2019-early 2020, China's PDH demand was mostly weaker compared to highs of about 230,000 b/d earlier in 2019

Why PDH demand will finish 2020 with more than 50,000 b/d of year-on-year growth led by China:

- Capacity additions
- Waivers on US propane imports
- Utilization rates are already coming back

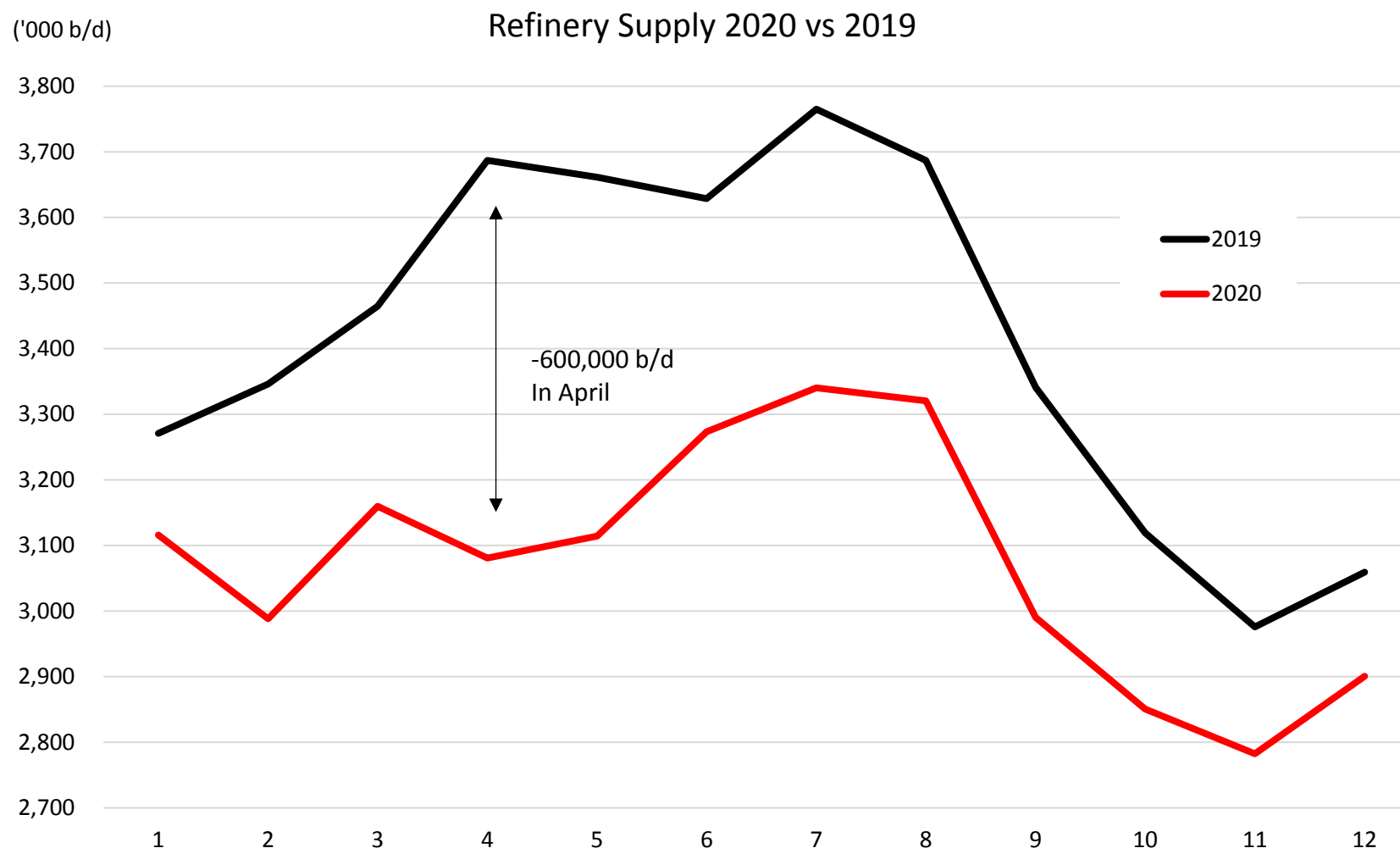
Demand is recovering, the gap between 2020 and 2019 will narrow



Fundamentals: Supply & Inventories



Supply: Refining activity will take years, not months, to fully recover



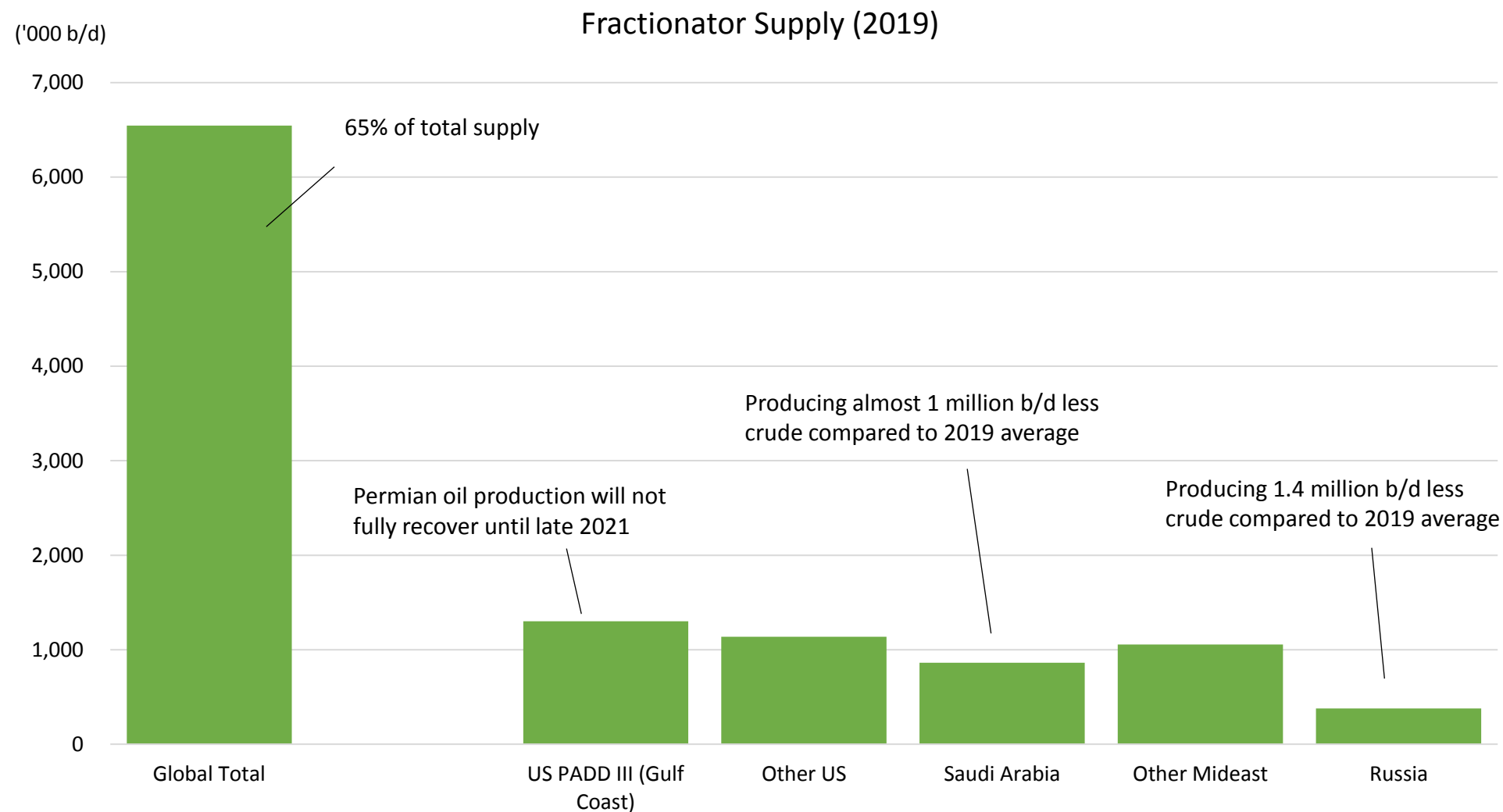
Refineries produce 35% of total

In year through August, average output was 400,000 b/d less compared to 2019

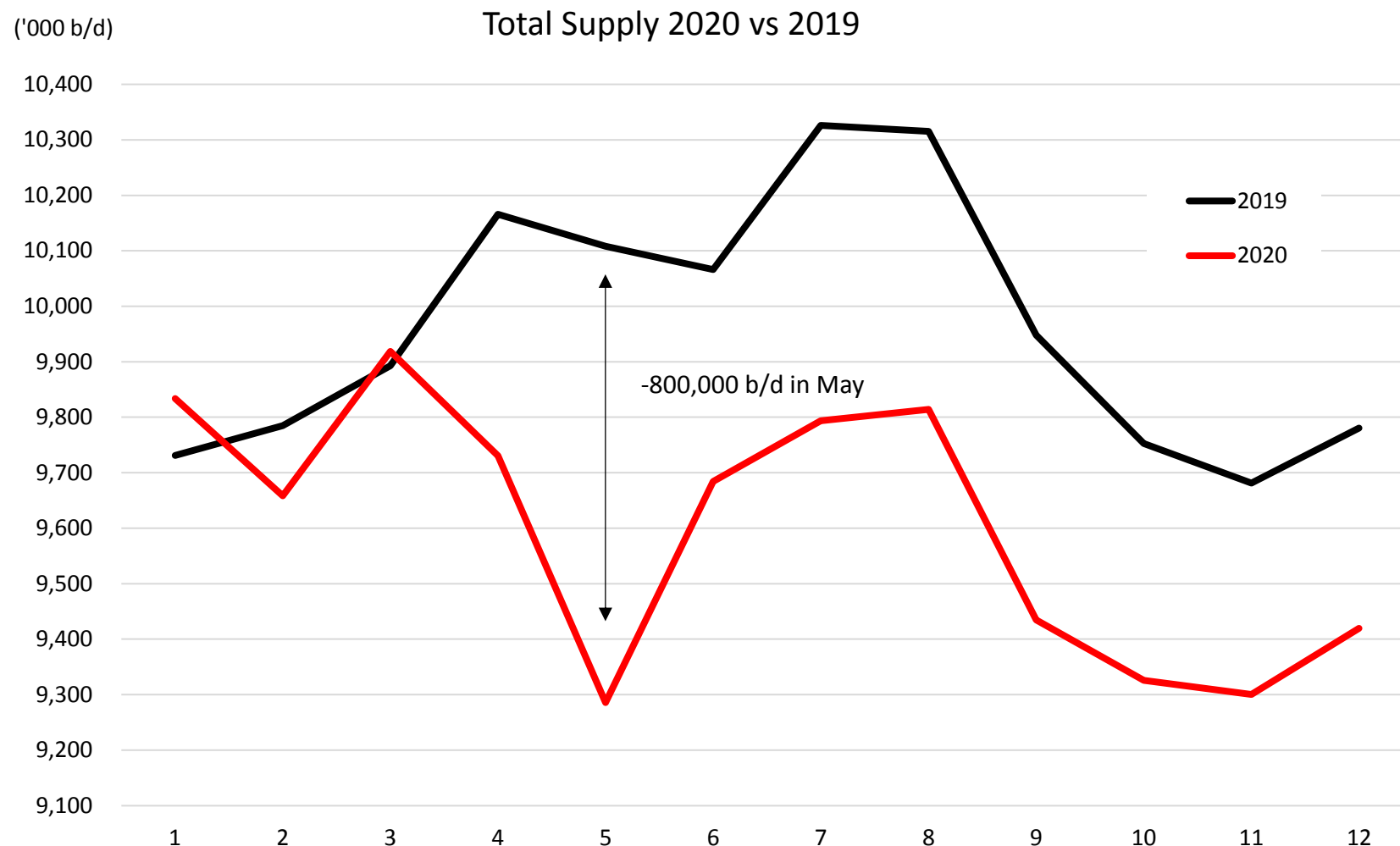
Gradual recovery of refined product demand, high product inventories rule out a quick recovery of refining activity

In Sep-Dec, output projected 200,000 b/d lower year on year

Supply: Decreased oil production dragged down fractionator supply



Supply will not recover nearly as much as demand in late 2020

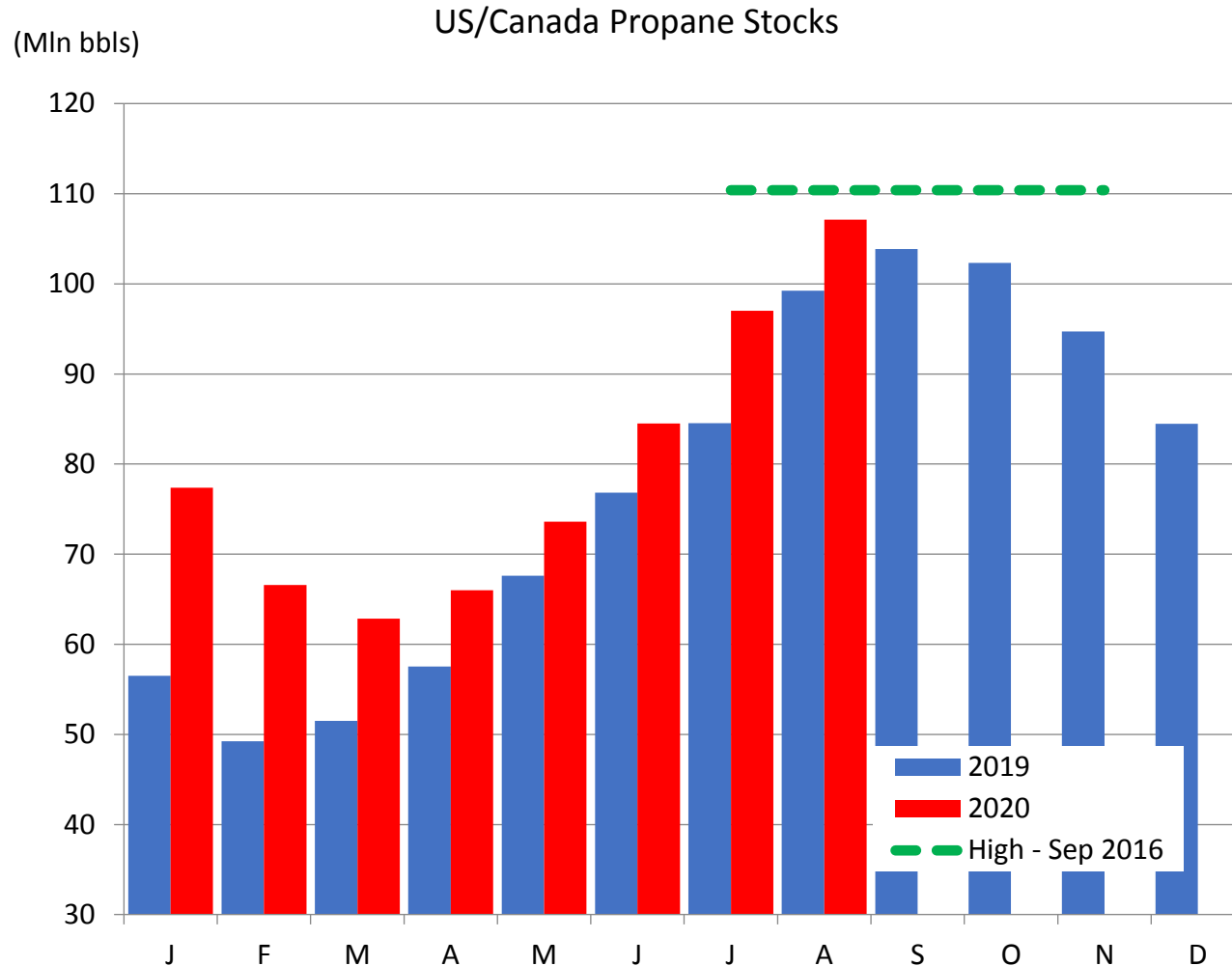


In 1st quarter, fractionator supply peaked and total supply was unchanged compared to a year earlier

In year through August, average supply fell 300,000 b/d compared to a year earlier, the same as demand

In late 2020, year-on-year decrease will exceed 400,000 b/d

Inventories: So far, market disruptions have not prevented stocks from expanding



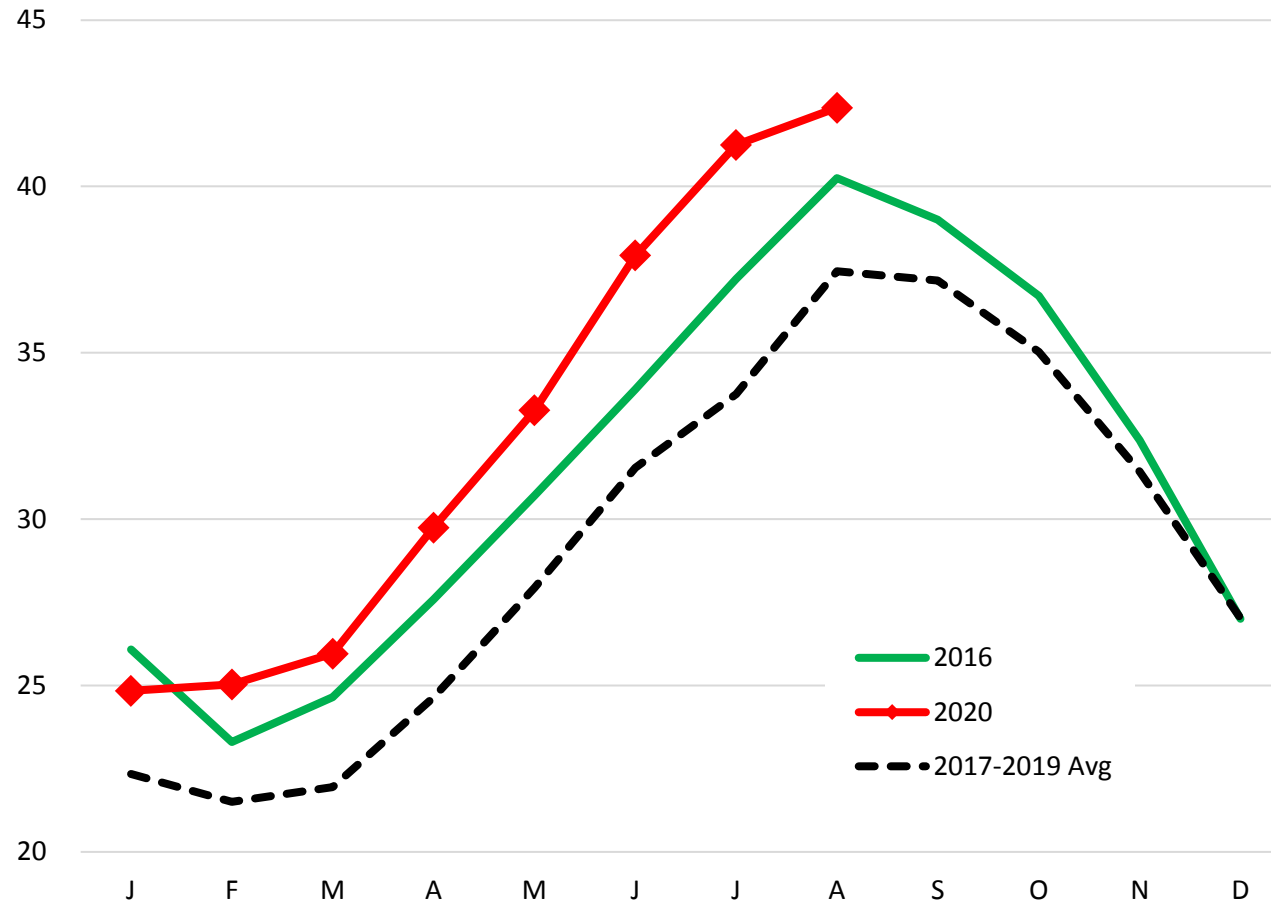
Since supply-demand changes have been offsetting thus far in 2020, it has been business as usual for stock builds

For 3 years, North American propane stocks have been building

Currently stocks are nearing their historic high of 110 million barrels in September 2016

Global Inventories - Days of Forward Cover

(Days of Cover)



From an inventory versus demand perspective, there is an extraordinary glut

- Currently there are 42 days of cover
- In August 2016 when there were 40 days of cover, the market was still oversupplied
- The 2017-2019 average for August was days, closest to “normal”

What is the short-term outlook for the recovery of demand & supply?

- In the year to date, demand and supply both fell 300,000 b/d compared to a year ago
- If until now changes in supply and demand have been offsetting, their trajectories will diverge going forward
- In the final four months of 2020, the gap between demand this year and last will almost halve to 170,000 b/d
 - More than a third of the demand collapse was due to lower Autogas use, especially in the second quarter. Going forward demand should be only 20,000 b/d below normal levels.
 - Petchem demand at naphtha crackers collapsed in the second quarter but began recovering in July. While demand will fall short of 2019 levels, it will continue to recover.
 - US refinery inputs of butane for gasoline production will be weaker compared to last year.
 - In more bullish developments, residential/commercial use will be unchanged year on year, and PDH use will strengthen.
- Supply will not recover nearly as much as demand in late 2020, lagging by 400,000 b/d compared to a year ago

What are the implications for fundamentals & pricing?

- Due to supply-demand changes, stocks will draw down much more than usual this winter
- Stocks will be drawing down from a very high starting point – there are 42 days of forward cover, 5 more than normal
- For now, high forward cover is exerting downward pressure on LPG prices, reinforcing the demand recovery
 - As oil prices have recovered, LPG prices have reestablished wide discounts to naphtha.
 - The combination of wide discounts to naphtha and low outright prices is ideal for stimulating demand in all sectors.
- Eventually, stocks will draw down enough to result in scarcity that will provide bullish support for pricing which will lead to narrow discounts to naphtha

Implications for trade?

- Supply-demand trends will be very bullish for export demand for North American product
- The setbacks to supply from decreased refining activity and OPEC+ production cuts mean that supply has fallen in all the key markets affecting trade – Asia, the Middle East, Europe, Russia...
- The collapse and now recovery of demand affect demand most in the Far East and Europe, big importing markets
- These changes mean greater Asian and European imports and reduced competition from exporters
- Export demand will draw North American cargoes, drain stocks, and undermine US petchem



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Q&A

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China – Products & Trade

CIS – Crude & Products

Europe – Crude & Products

Latin America – Crude & Products

Middle East – Crude & Products

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