



# Oil, Shale Gas and NGL Markets: *What Does the Future Hold?*

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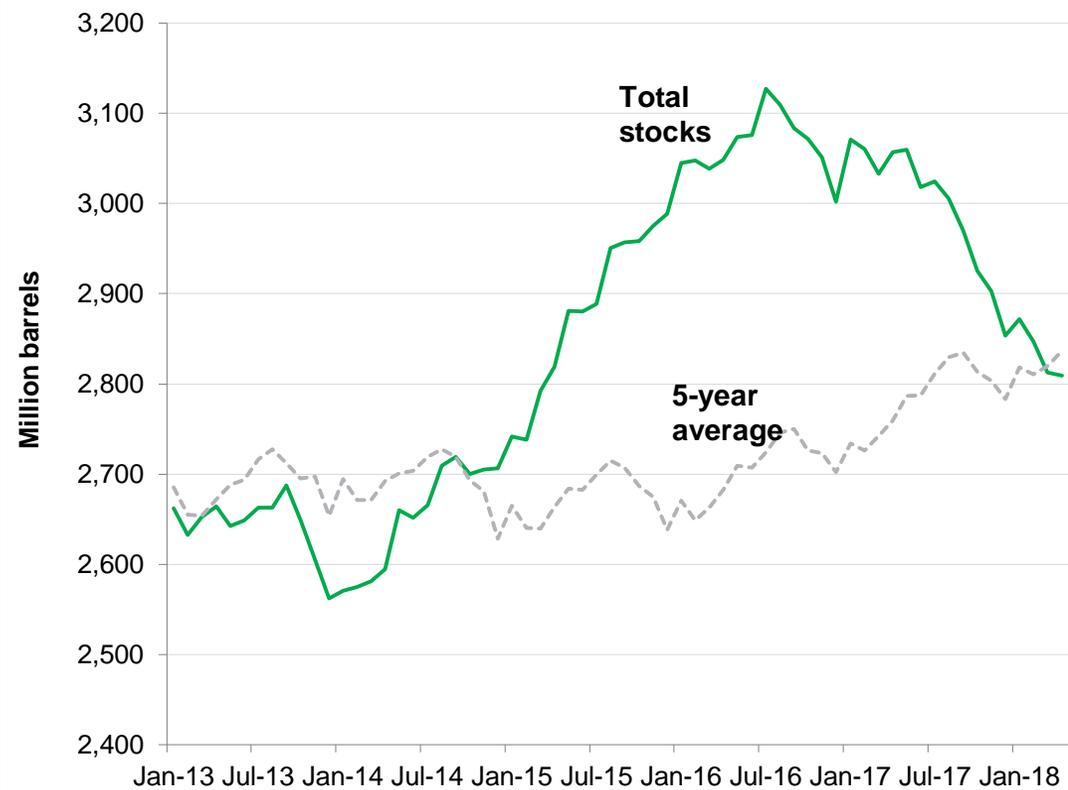
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# Crude Oil Markets

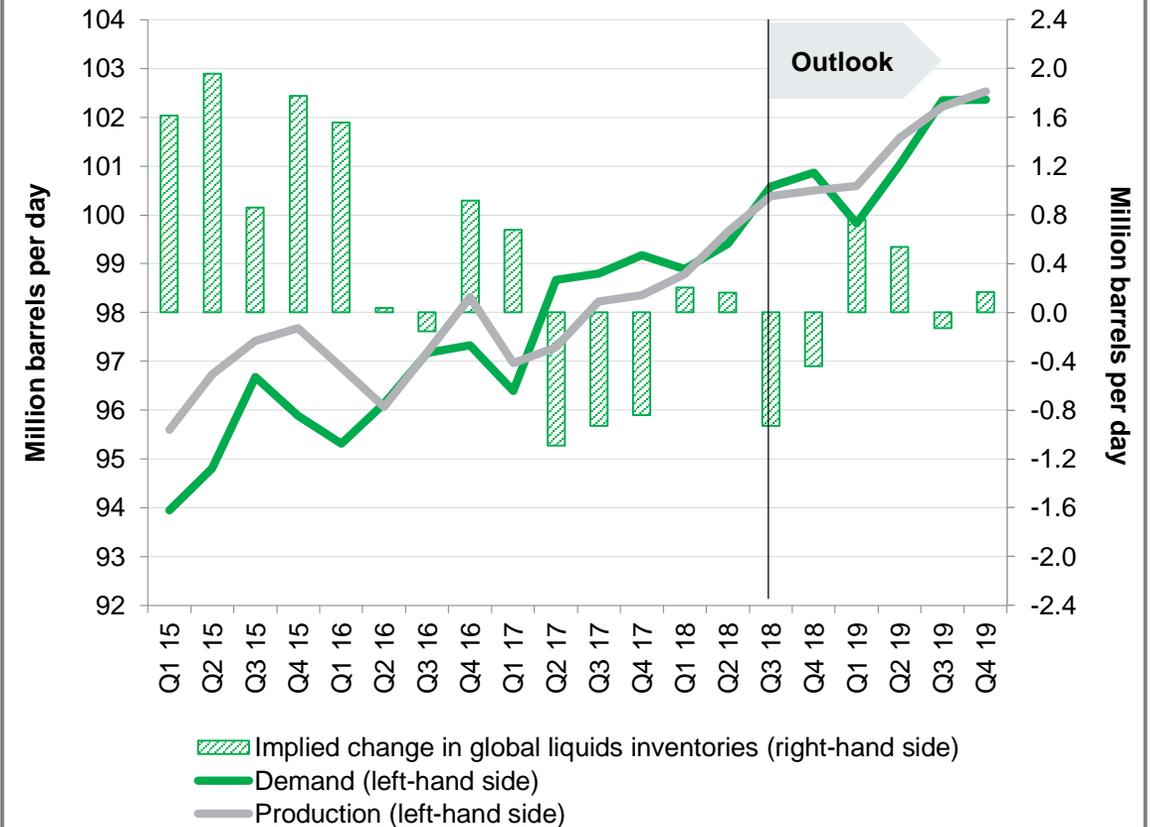
# Market's focus shifts from too much supply to... Not enough?

OECD total oil industry stocks



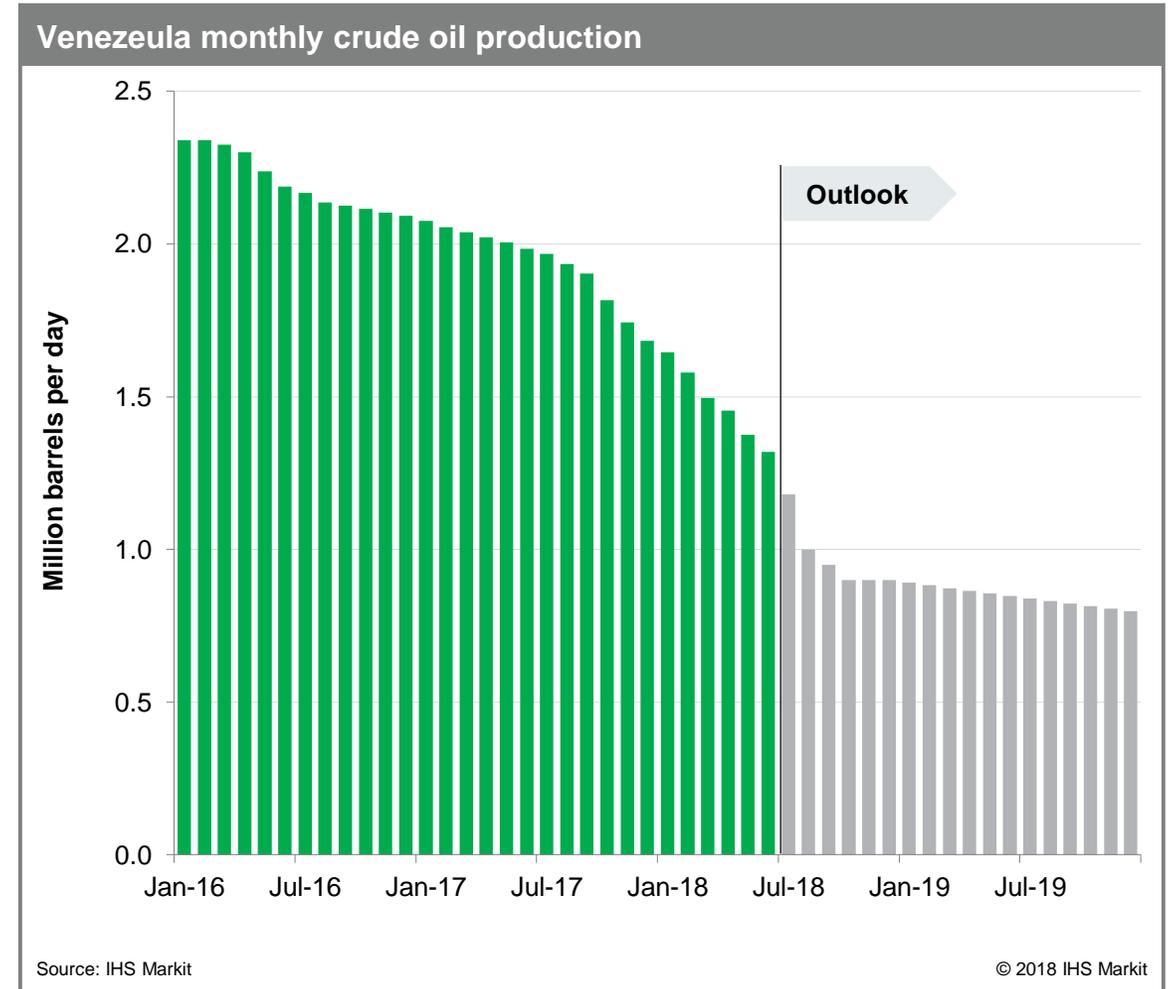
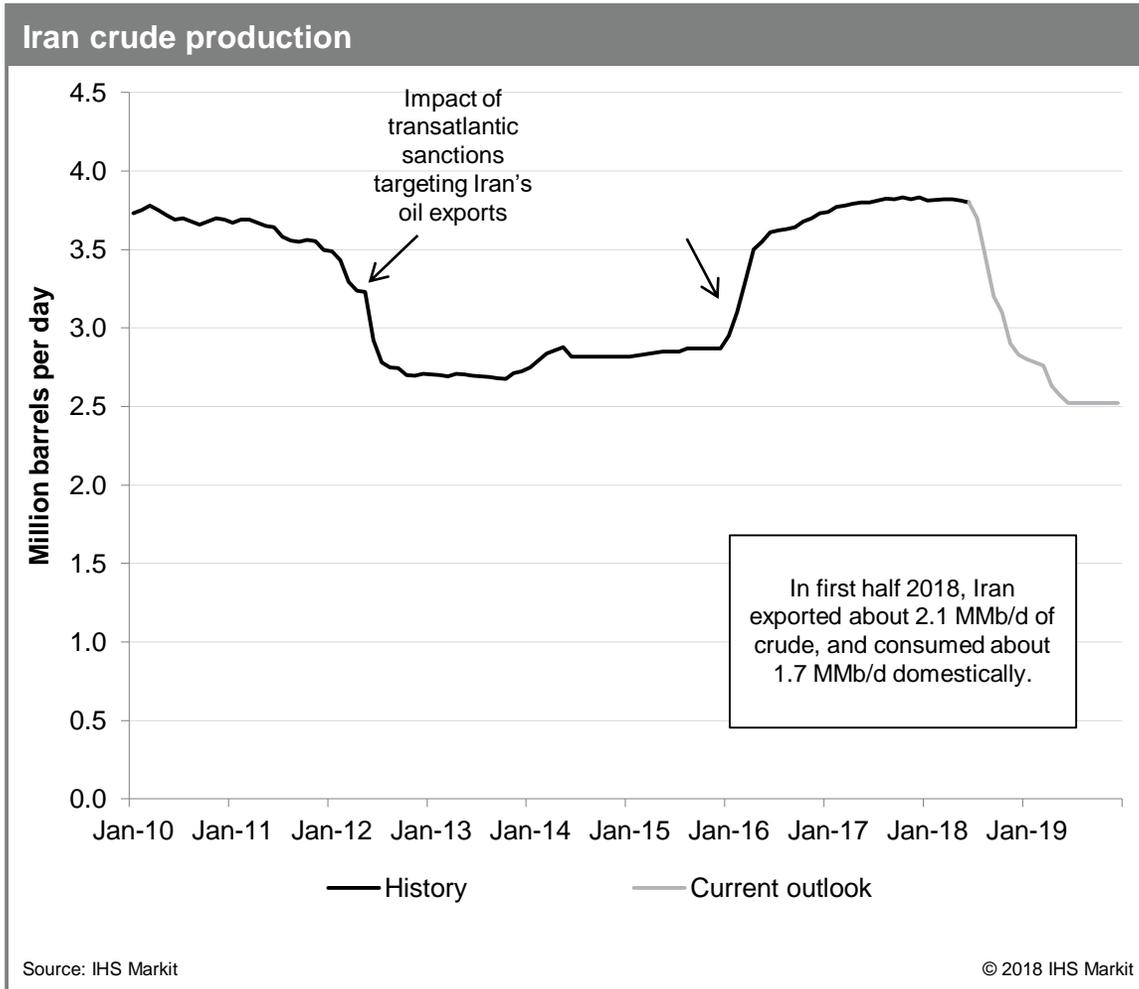
Notes: Total oil industry stocks include crude, refined product, NGL, and feedstocks. Data are monthly, through April 2018.  
Source: IHS Markit © 2018 IHS Markit

World oil (liquids) demand and production, and implied change in global liquids inventories



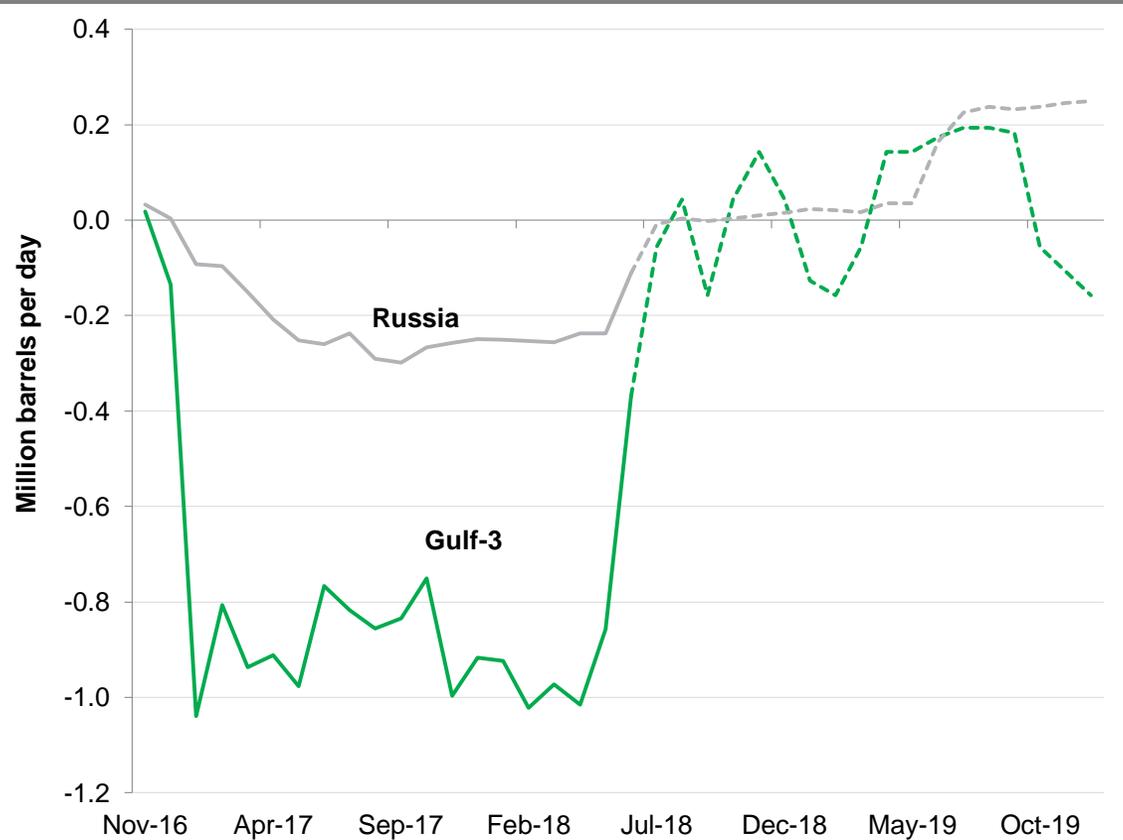
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# Anticipated major supply disruptions from Iran and ongoing supply shortfalls from Venezuela could stifle the market



# More supply required from the Gulf 3 and Russia would make spare capacity cushion thinner at time of rising supply risks

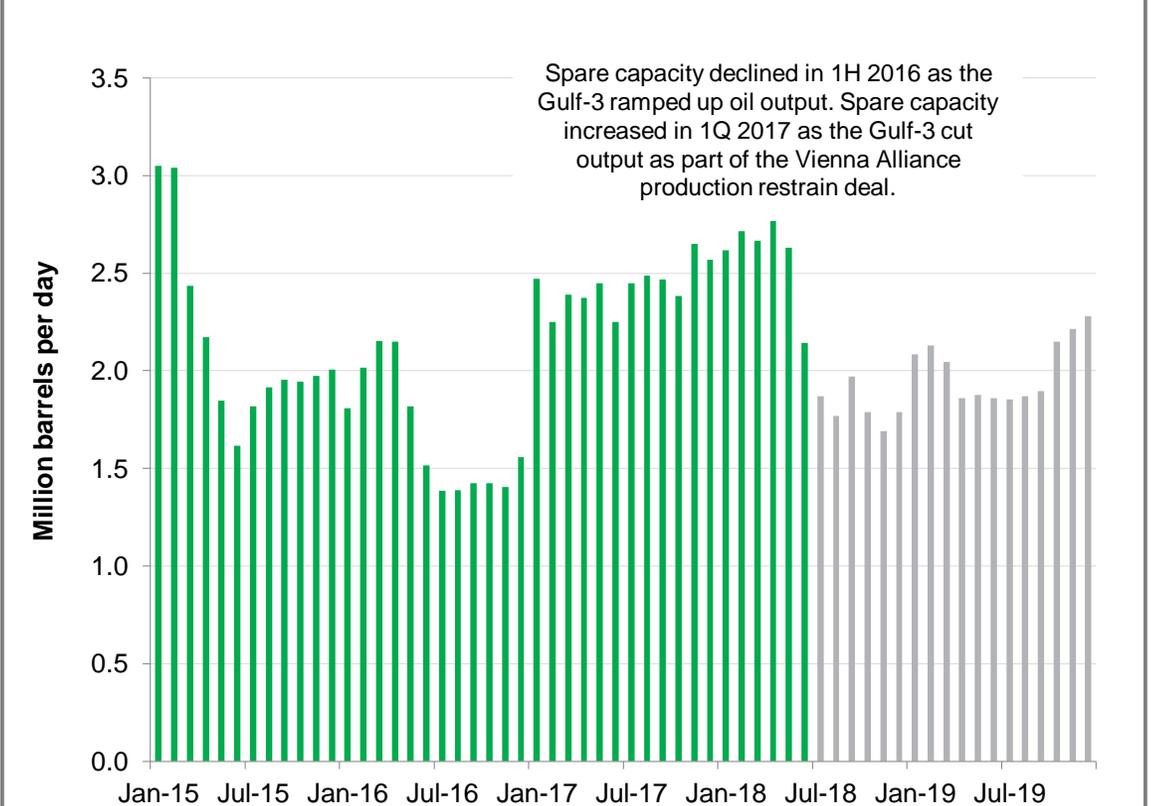
Gulf-3 and Russia crude oil production compared with October 2016



Notes: Gulf-3 are Saudi Arabia, Kuwait, and UAE.  
Source: IHS Markit

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Gulf-3 indicative spare crude production capacity

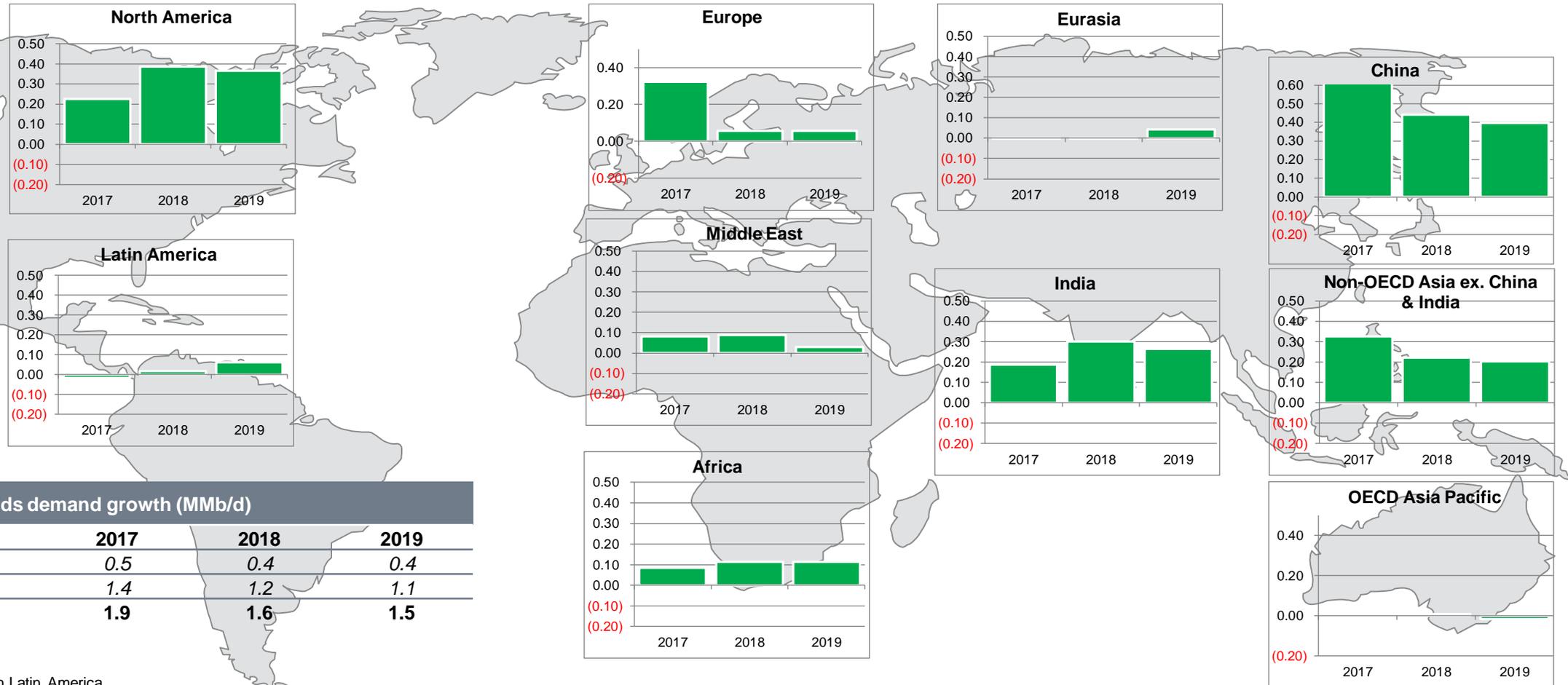


Notes: Gulf-3 includes Saudi Arabia, UAE, and Kuwait.  
Source: IHS Markit

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# Oil demand growth to remain robust but downward pressure exists from high oil prices and trade war

Changes in oil (liquids) demand by region (volume change from previous year in million barrels per day)

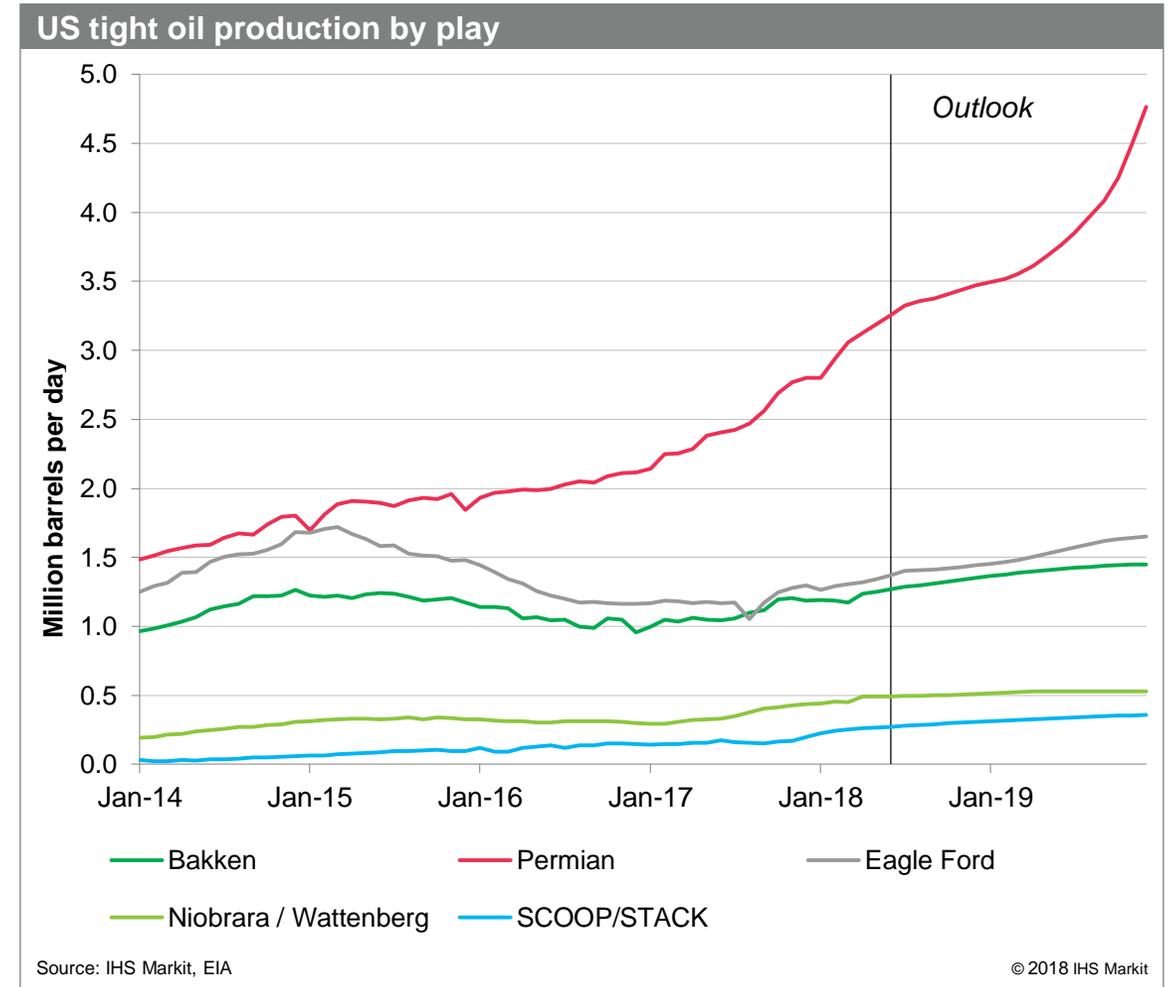
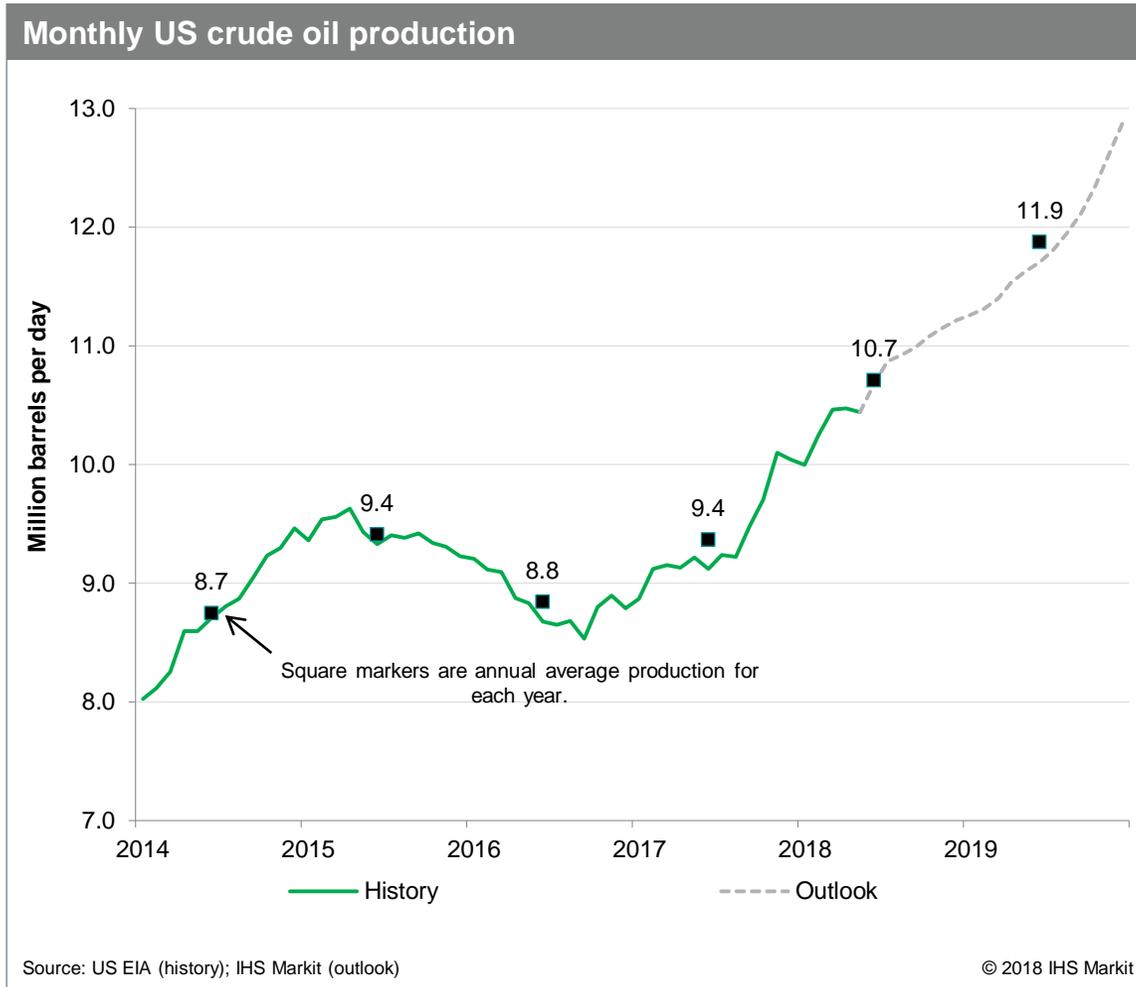


Global liquids demand growth (MMb/d)

	2017	2018	2019
<b>OECD</b>	0.5	0.4	0.4
<b>Non-OECD</b>	1.4	1.2	1.1
<b>Total world</b>	<b>1.9</b>	<b>1.6</b>	<b>1.5</b>

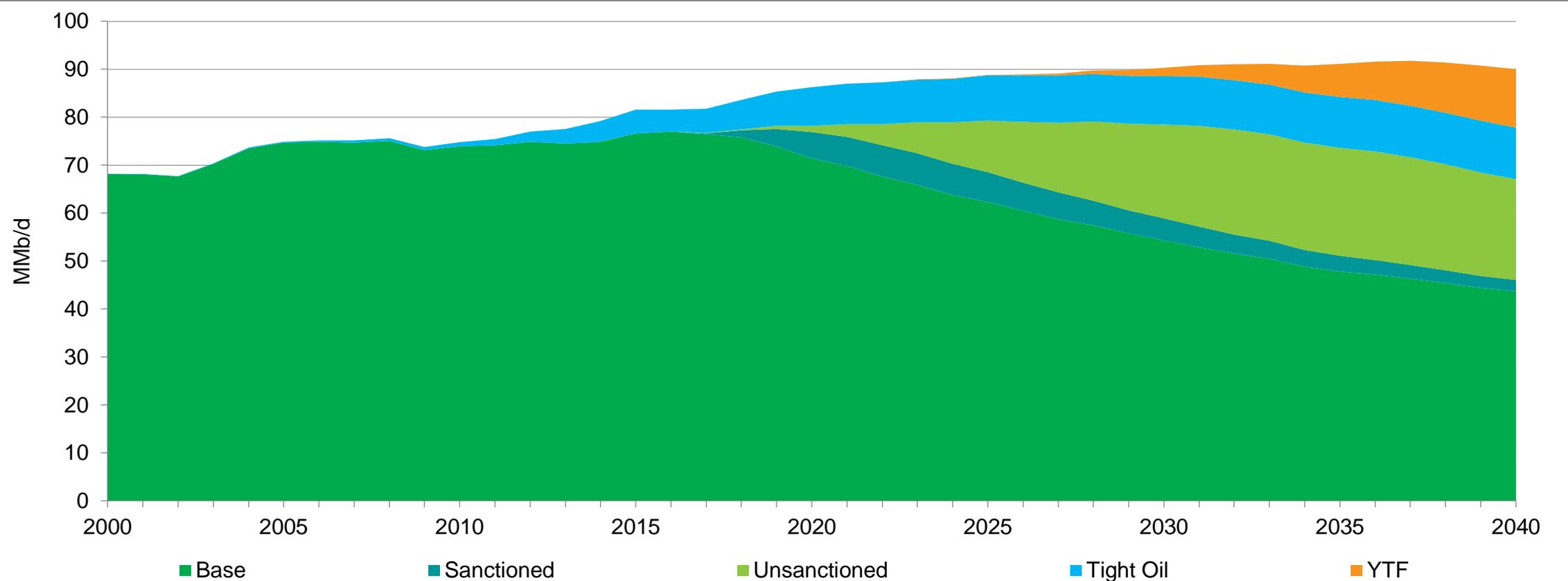
Notes: Mexico is included in Latin America.  
Data in table may not add up due to rounding.  
Source: IHS Markit

# Strong US shale growth all but certain led by strong growth from Permian basin



# Global conventional base production average aggregate decline rate of ~2.5% requires new tranches of supply

Global crude & condensate production by development



Source: IHS Markit

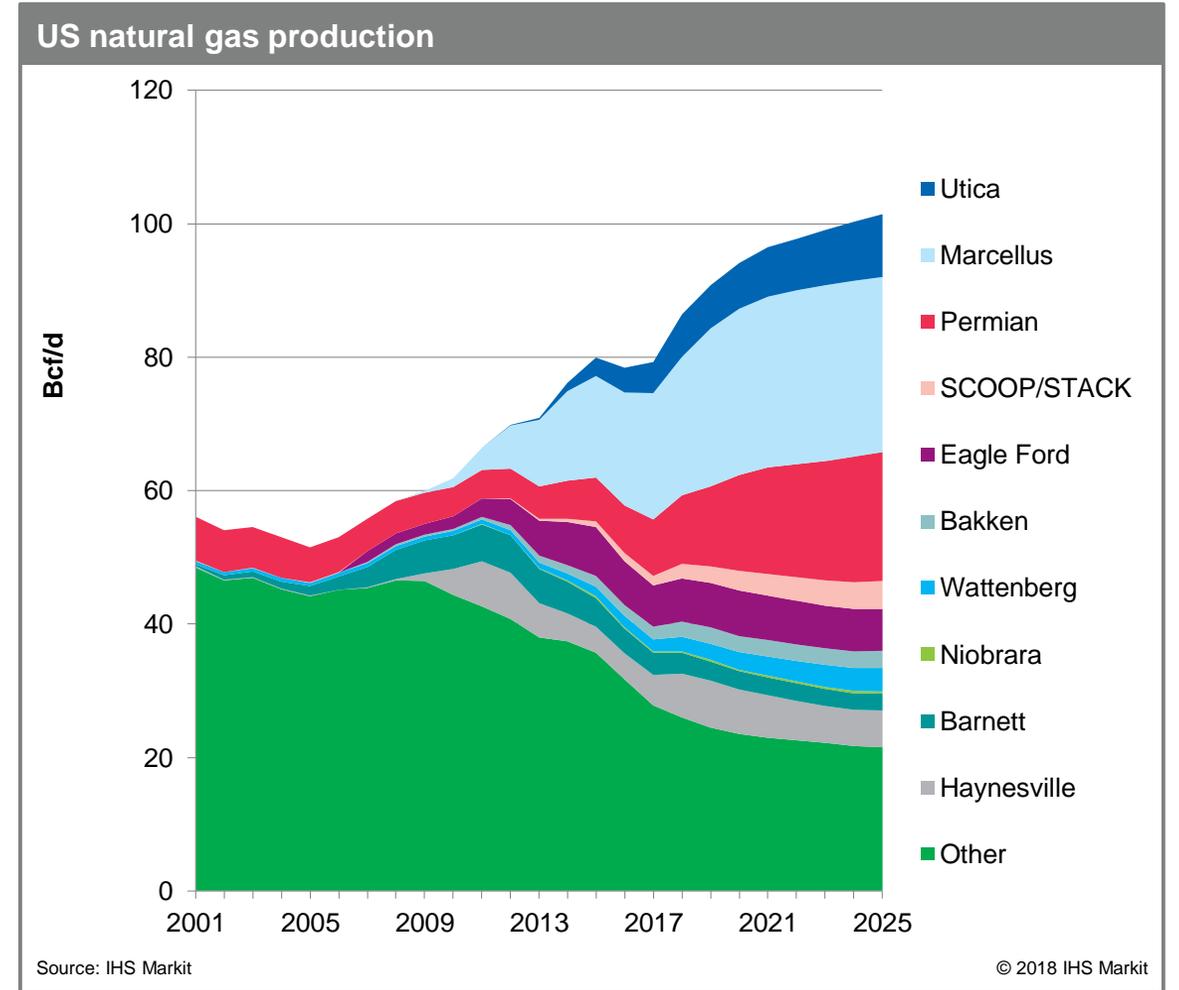
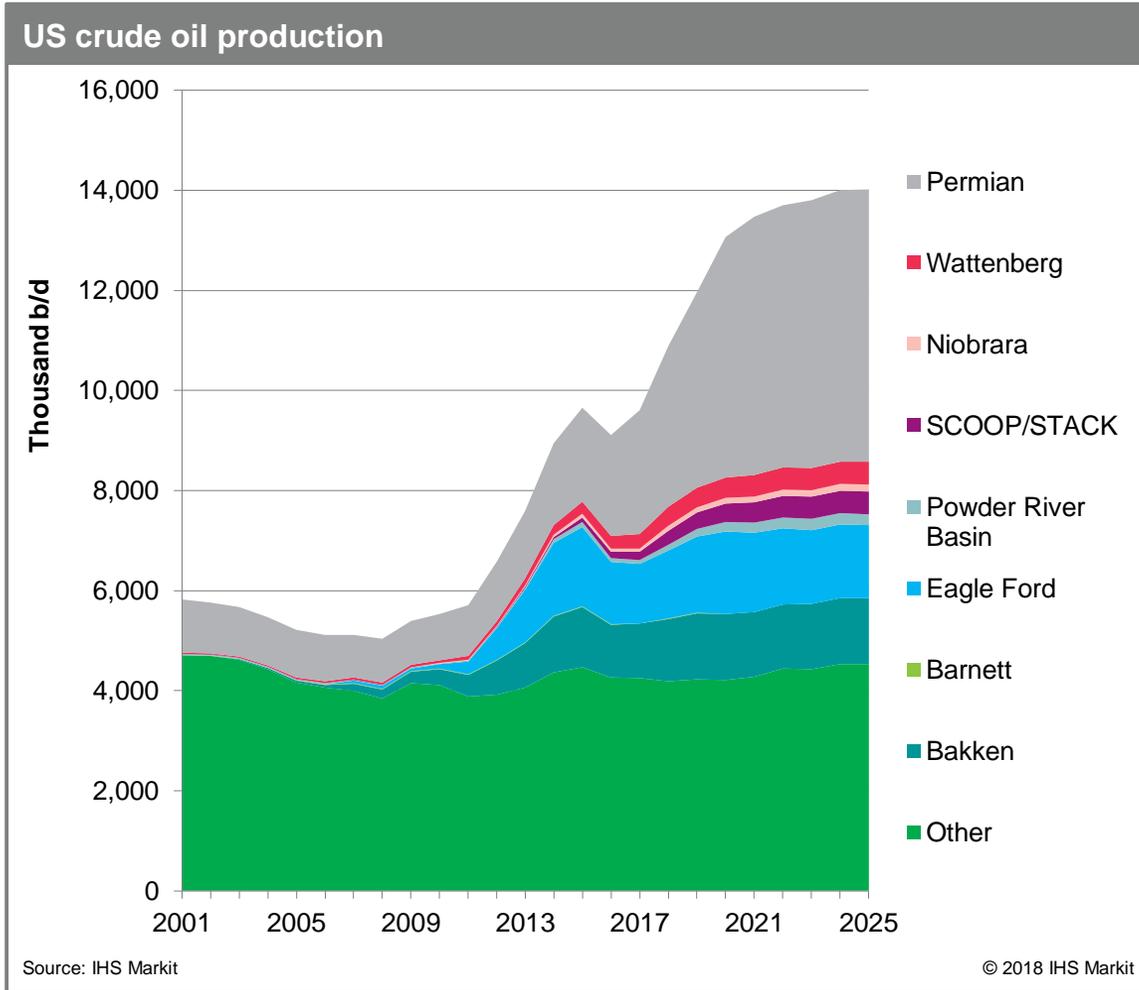
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## Key messages

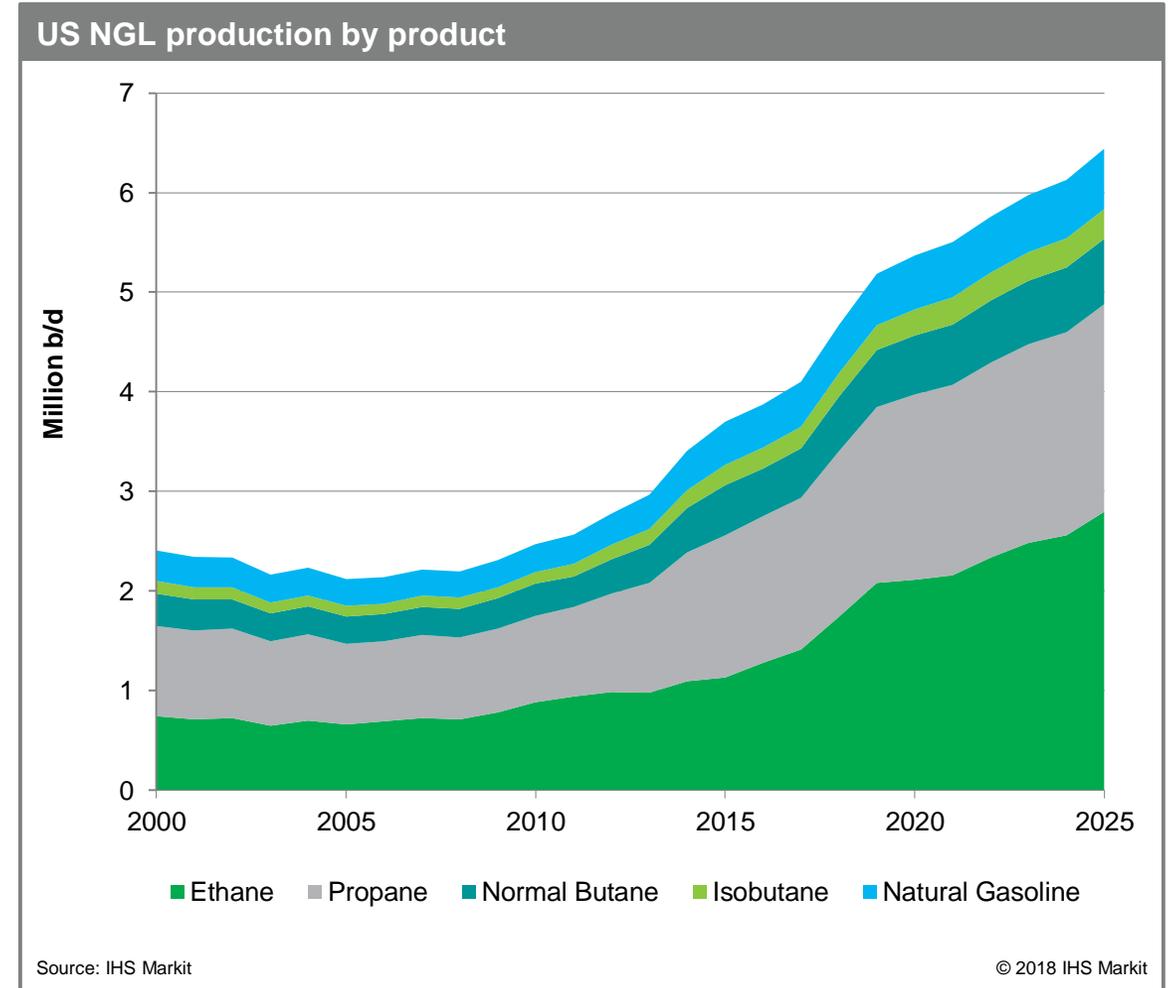
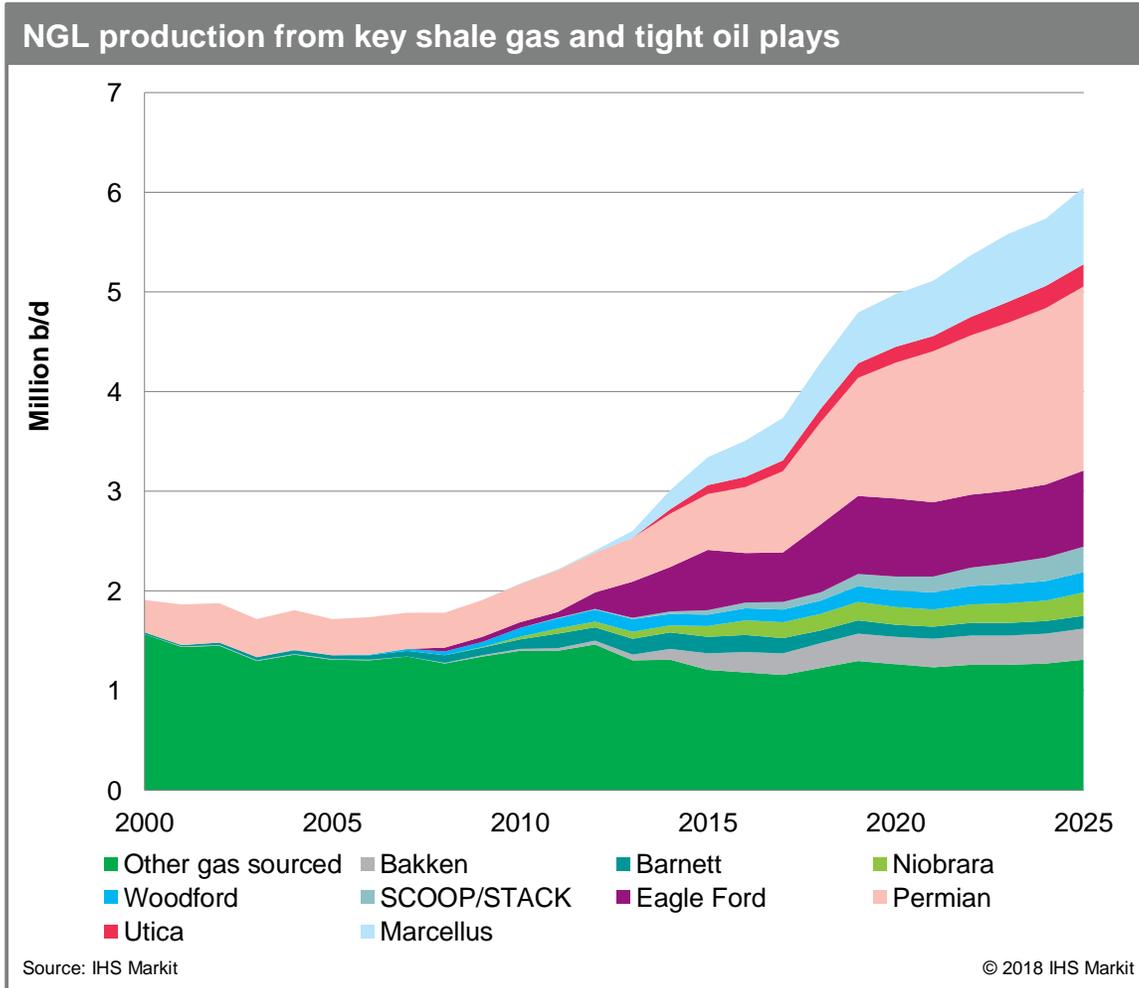
- Rising supply risks from Iran and Venezuela will keep the oil market on the edge amid shrinking spare capacity. While US production will continue to rise alleviating some of the concerns, looming logistical constraints could tame the growth in the 2019.
- Prospects for world oil demand growth remain bright for now – but trade wars and higher oil prices and currency depreciations in the emerging markets are big downside risks.
- As over 40 MMb/d of new supply needed to meet long term demand offsetting global declines, oil price should be high enough to incentivize investments in marginal high cost crude oil production.

# Shale Gas and NGL Markets

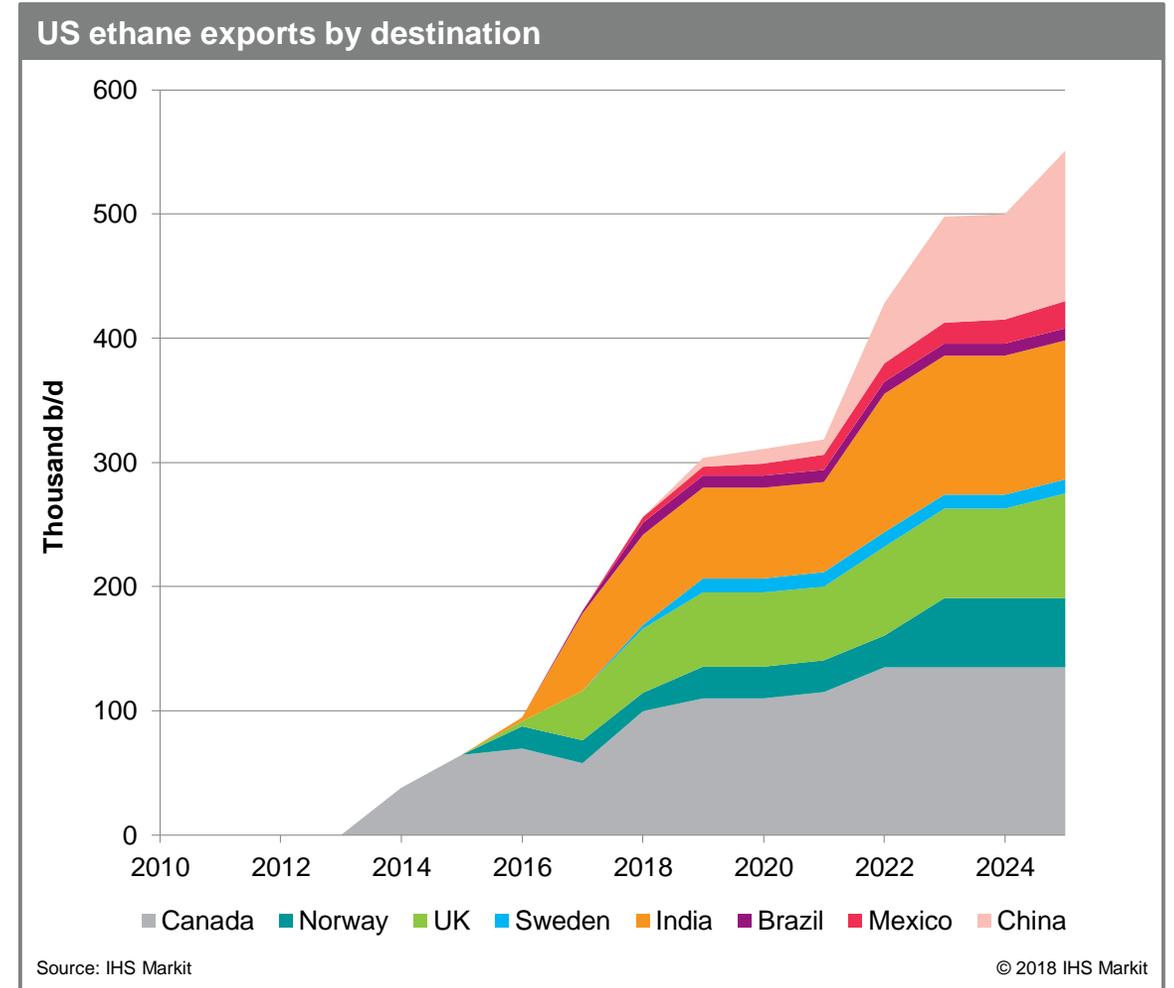
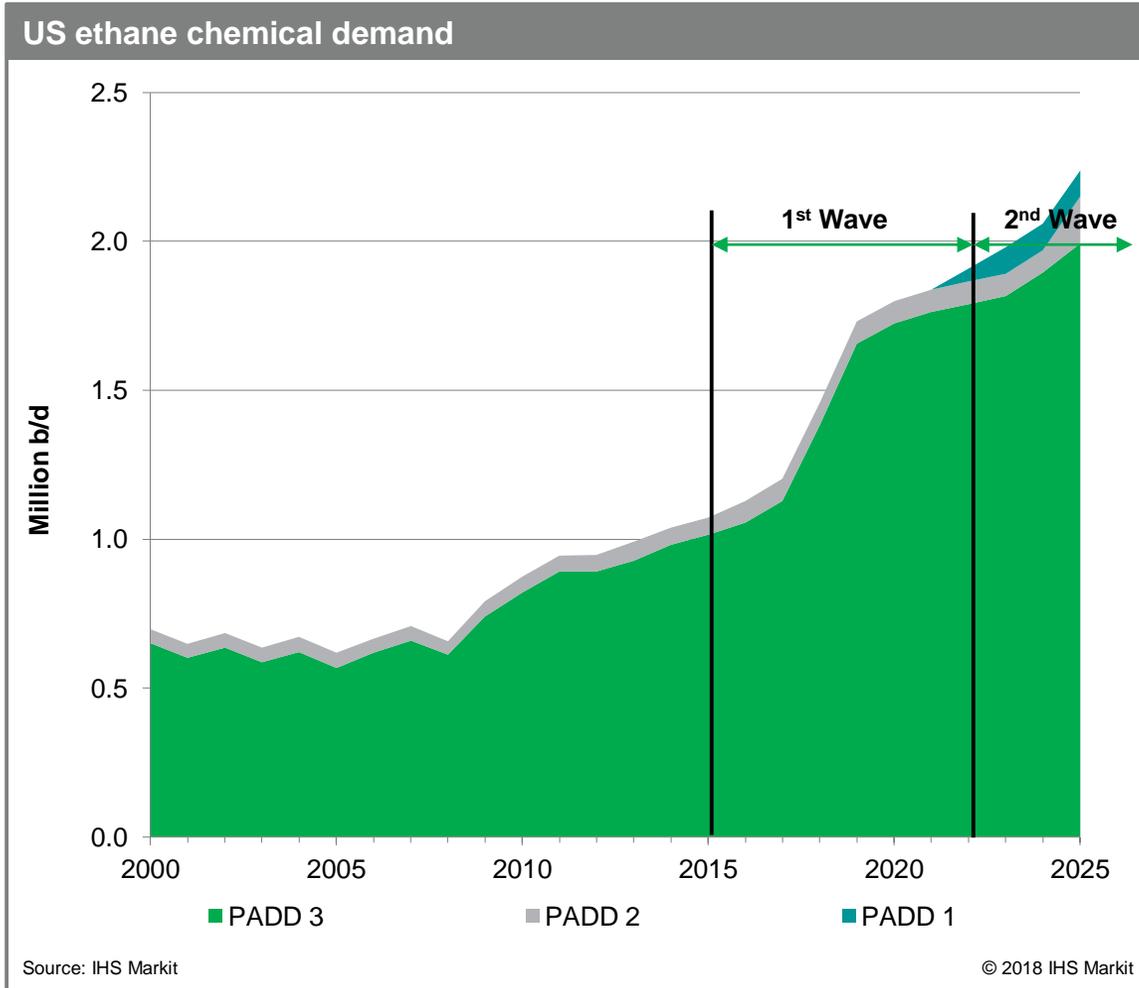
# Permian will be the dominant play for crude oil; and non-associated gas production will increase in Marcellus and Utica



# Increasing crude oil and gas production from Permian, Eagle Ford and Marcellus plays will boost NGL production from the US



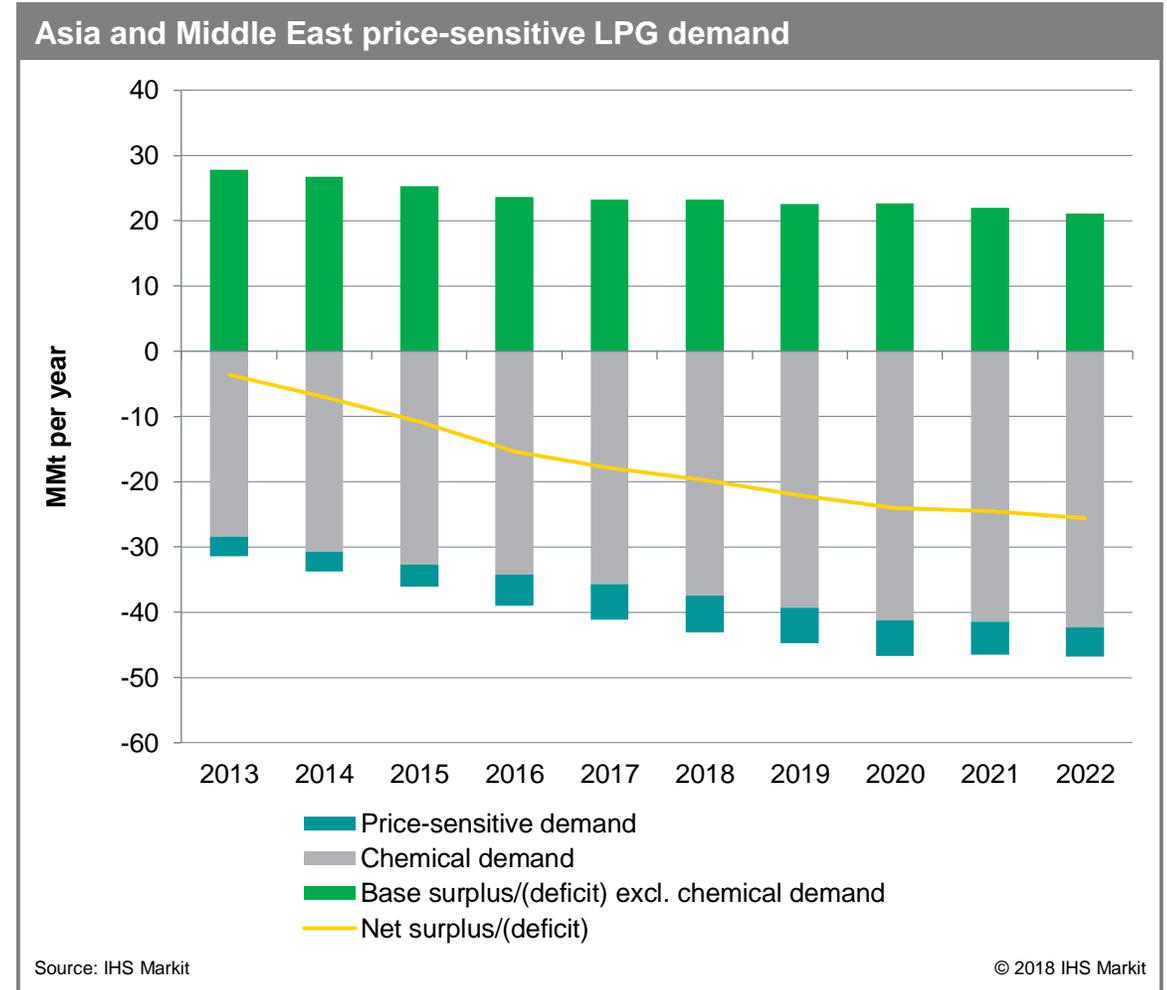
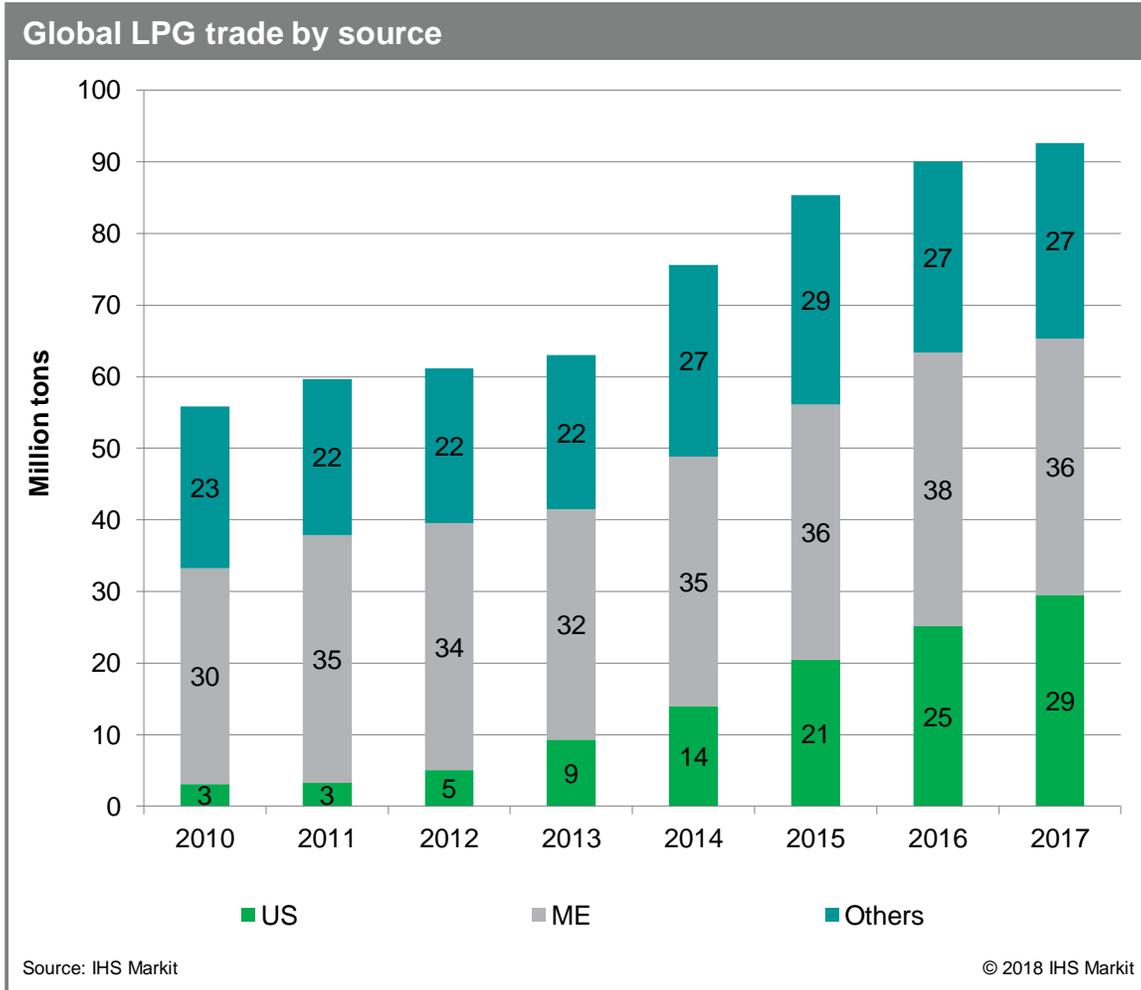
# Volume and pace of ethane exports to China will depend on US export terminal capacity and the cracker build up in China



# Long list of ethane crackers are being planned, but how many will come?

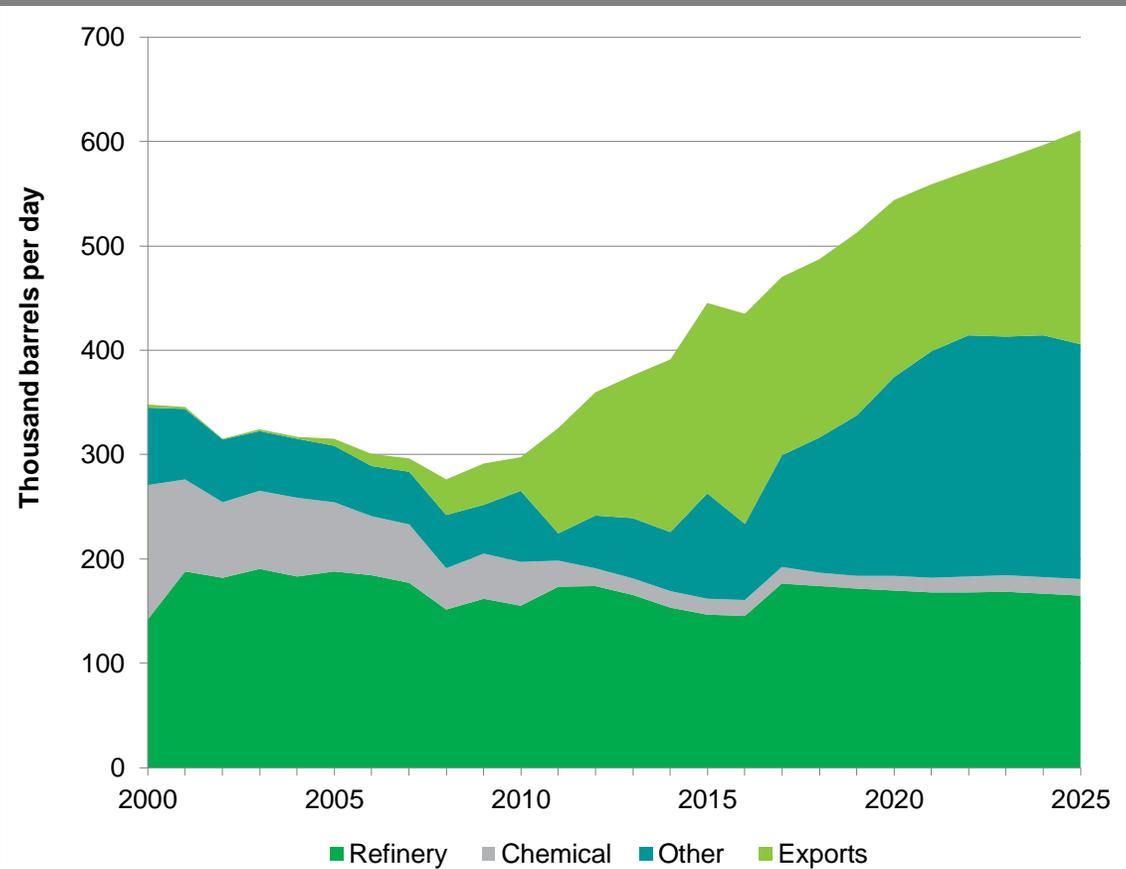


# More supply availability from the United States and the Middle East will be cleared as petrochemicals feedstock in Asia



# Increased condensate production in Canada could lead to exports of US natural gasoline to Asia

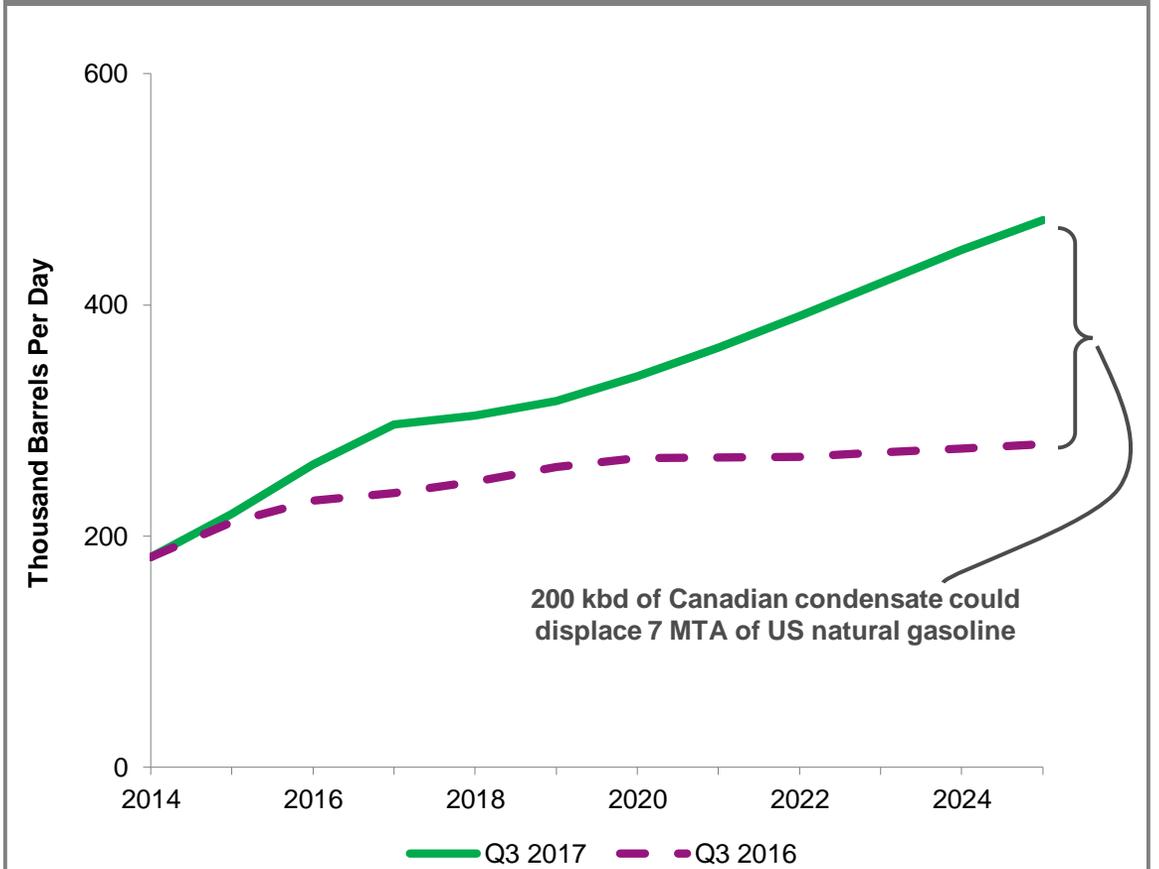
US natural gasoline demand and exports



Source: IHS Markit

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Western Canada condensate supply



Source: IHS Markit

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## Key messages

- Rapidly rising associated gas production from Permian, coupled with increasing non-associated production from Marcellus and Utica will keep Henry Hub prices in check.
- Ethane availability from the US would rise despite rising domestic demand from ethane-based ethylene capacity but it is quite uncertain how many of ethane crackers would be built in China.
- Dramatic increases in US exports have resulted in major changes in global LPG trade flows and Asia becoming the global “demand sink”.

Thank you

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