

# Global Oil Supply and Demand Outlook

Summary | 2019 H1



Energy Insights  
By McKinsey

# Historical recap 2018



## Summary

- Over the 12 months of 2018, oil prices have been highly volatile, oscillating between USD85/bbl and USD50 by the end of the year
- Rapid recovery in shale drilling translated into 1.1 MMb/d production growth in the US, despite the NA independents returning lower profits to shareholders
- After depletion of excess inventories, OPEC abandoned restraint and returned to growth – even offsetting declines in Venezuela and Iran. In December, the cartel decided to reinstate a cut agreement to help offset further market oversupply
- Further price volatility and oversupply has led to a new increase in inventories, and led the forward curve back into contango; yet positive sentiment post-2022 is higher than a year ago



# The oil price continued to rise in 1H 2018 - yet a Q4 2018 renewed supply build-up contributed to a steep 40% price drop

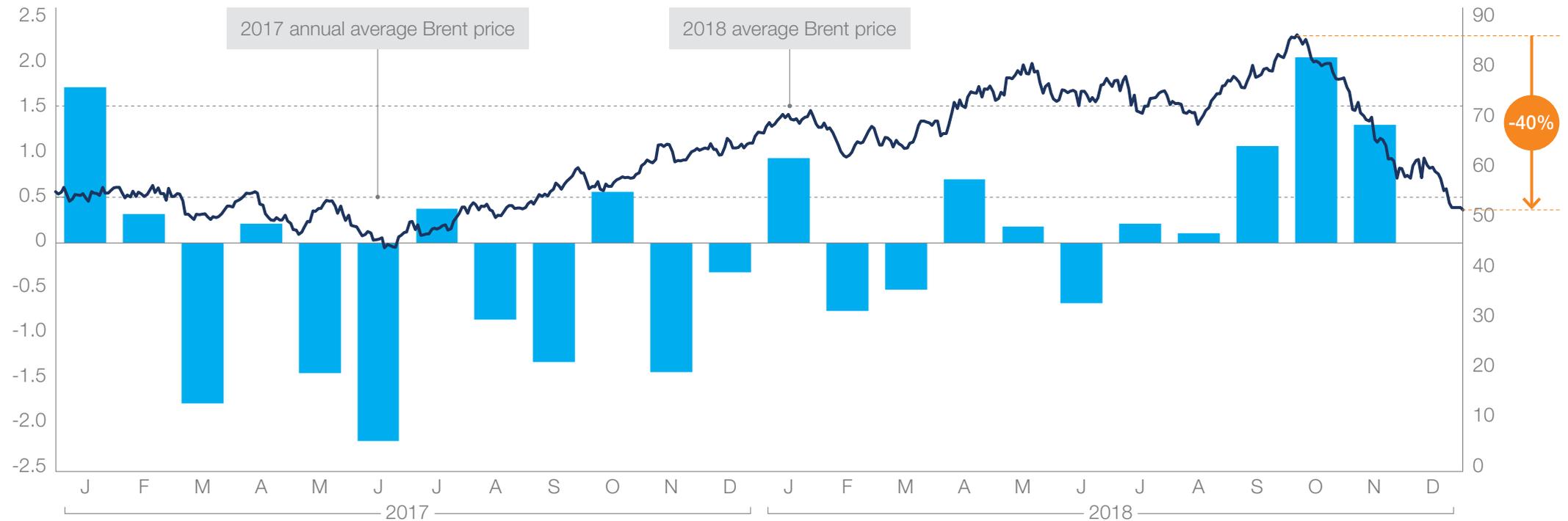
## Global oil market balance

2017-2018

Oil supply minus demand — Brent

## Brent oil price

USD/bbl



Source: EIA, Energy Insights

## Supply-demand fluctuations were exaggerated by key geopolitical events such as Iran sanctions, leading to the higher-than-usual price volatility

Major events in 2H 2018 resulted in an escalation of oil market volatility in Q4 2018, approaching 2015-16 levels:



2H 2018 experienced the **deepest one-day sell off in three years**



The US **re-instated sanctions on Iran**; and later issued sanction wavers to the **importers of 75% of Iranian oil**



US and Saudi oil production reach peak growth, **surpassing 11.5 and 11 MMb/d** respectively



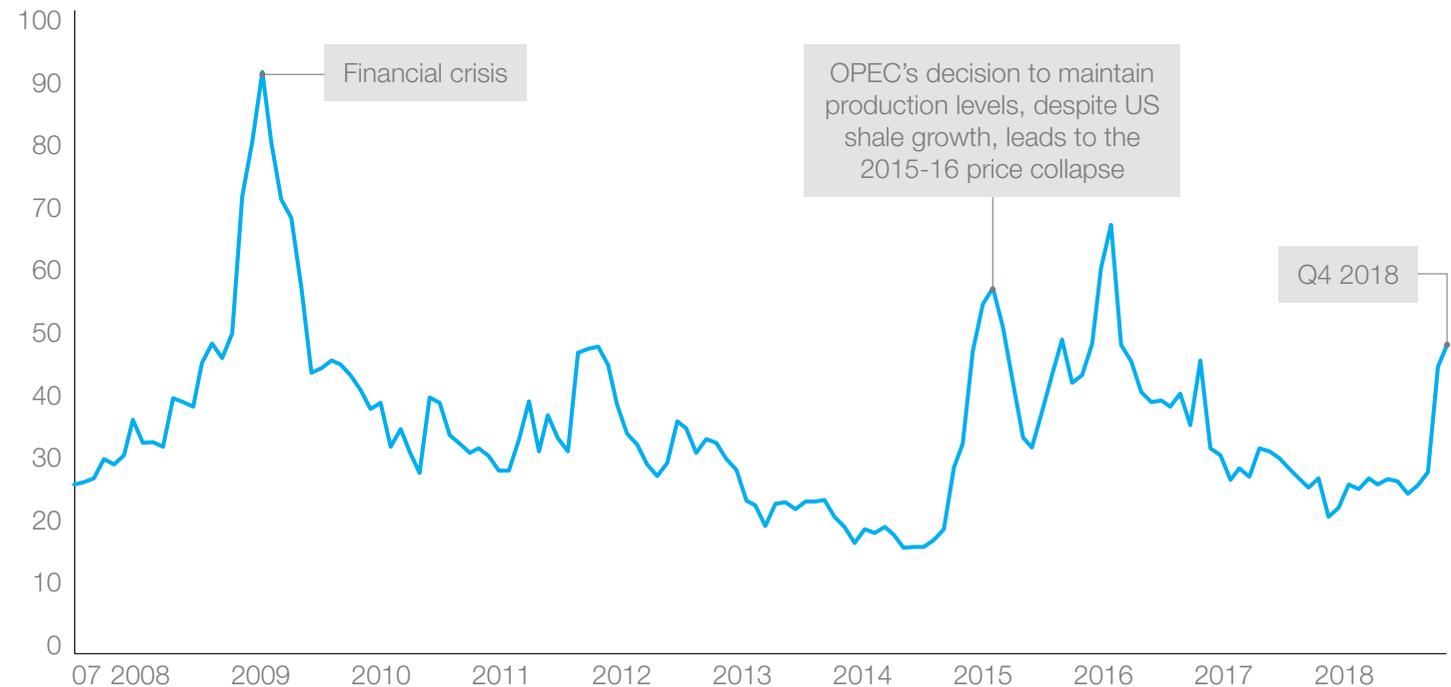
OPEC+ announced **1.2 MMb/d production cuts in Q4 2018**



Discussions on health of the global economy increased due to **protracted China-US trade tensions**

### USO VIX (OVX)<sup>1</sup>

USD/bbl



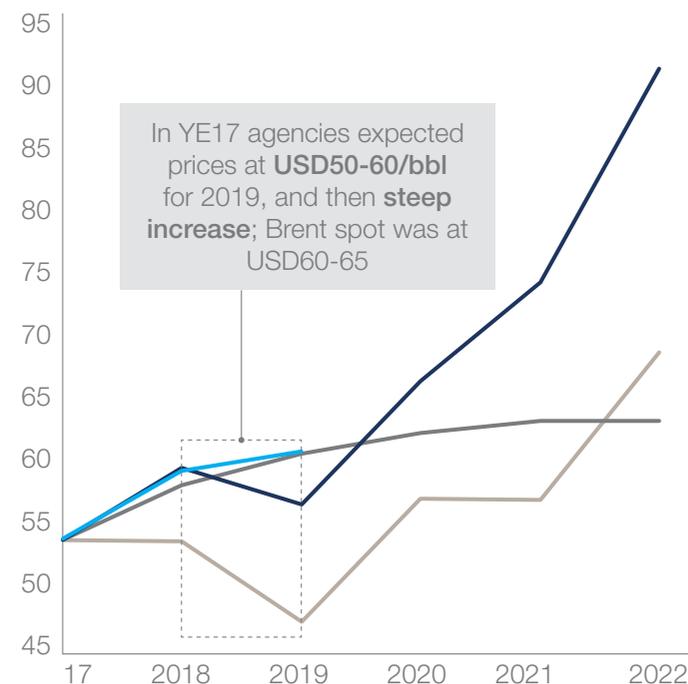
<sup>1</sup> Chicago Board of Trade Oil Market Volatility Index  
Source: Energy Insights, CBOE

# Market uncertainty has led the industry to a rapidly-changing range of expectations for the oil price

**YE 2017 Brent forecasts**

USD/bbl, 2017 real dollars

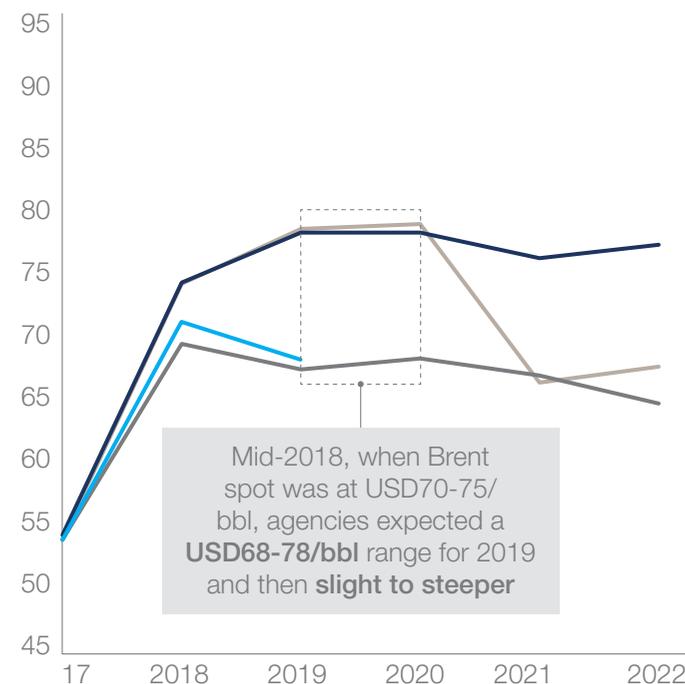
— FGE FACTs — Banks<sup>1</sup>  
— Rystad — EIA STEO



**Summer 2018 Brent forecasts**

USD/bbl, 2017 real dollars

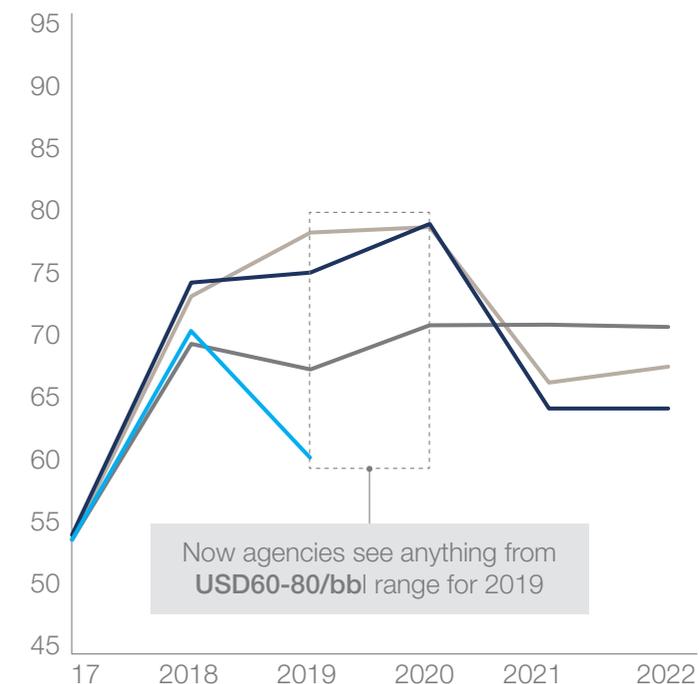
— FGE FACTs — Banks<sup>1</sup>  
— Rystad — EIA STEO



**YE 2018 Brent forecasts**

USD/bbl, 2017 real dollars

— FGE FACTs — Banks<sup>1</sup>  
— Rystad — EIA STEO



<sup>1</sup> Median forecast price from Bloomberg: 23 banks in YE 2018, 64 banks in in summer 2018 and 49 banks in YE2017

Source: EIA STEO January 2018 & July 2018 & December 2018; FACTS Asia Pacific Databook Fall 2017-Spring 2018-Fall 2018; Rystad database base case Brent; Bloomberg; Energy Insights

## Short term Up to 2022

### Emerging trends in the oil markets



## Summary

- If demand growth stays healthy and OPEC+ maintains discipline over production levels, we see market fundamentals resulting in average prices in the USD60-70/bbl range up until 2020
- After 2020, prices are likely to remain closer to USD60/bbl, driven by sluggish demand growth and continued growth of shale oil in North America as operators lean towards shorter-lead projects
- In a scenario where the global economy slows down even more, prices could fall to the USD50-55/bbl range if OPEC chooses not to intervene
- Prices could reach a high of USD80-90/bbl in a continued supply disruption scenario if MARPOL finds the shipping industry fully unprepared, Venezuela and Iran production drops further, and reduced effective OPEC spare capacity leads to further tightening



## We explore three oil price scenarios that could play out in the next three to five years

### Supply disruption continues

Volatile 2018 prices lead to skepticism towards offshore investment decisions. OPEC Gulf lacks spare capacity to step in and mitigate worsening production in Venezuela, Libya and US sanctions on Iran. US differentials restrict production growth. The global economy staggers on, while MARPOL creates >1 MMb/d of additional demand.

### OPEC control

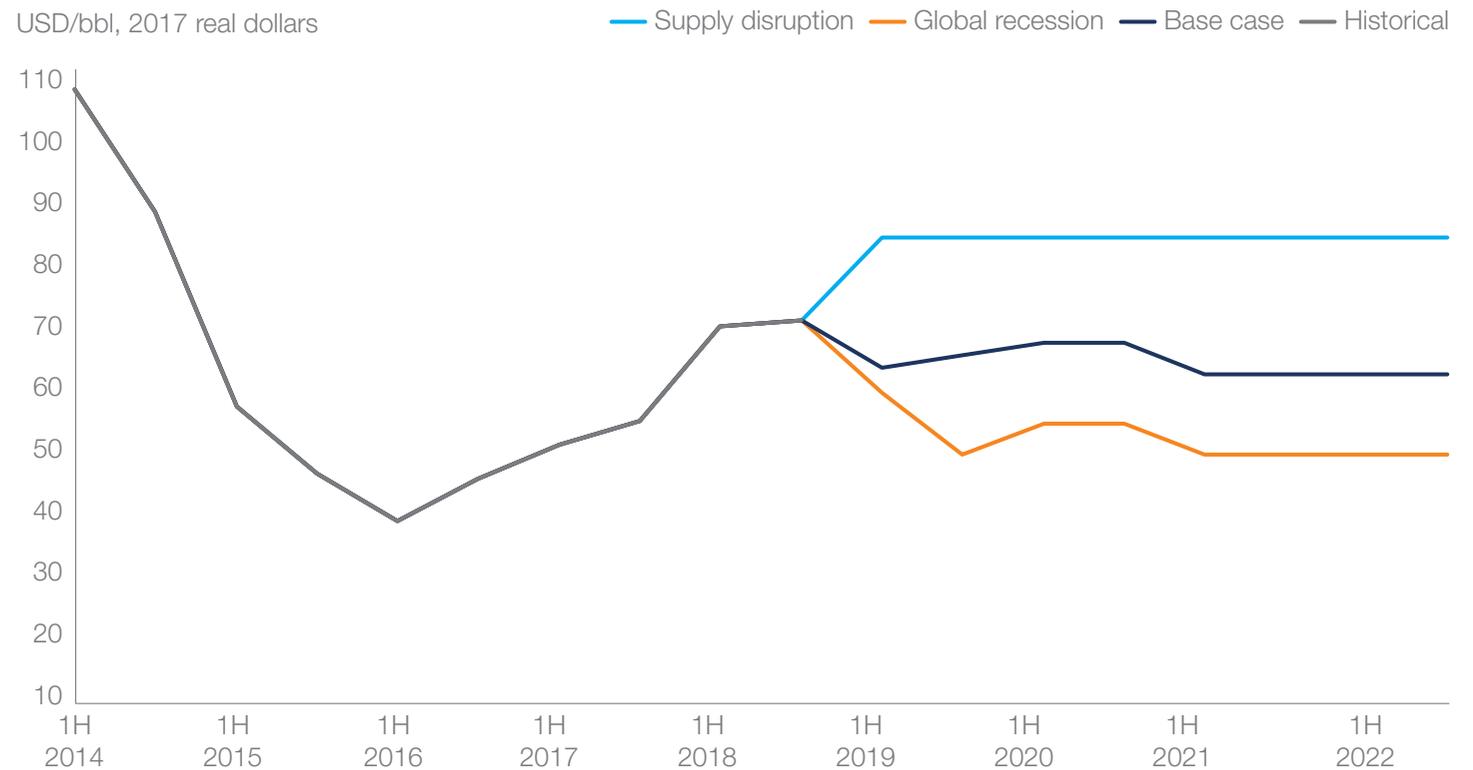
Healthy 2019-20 demand growth (supported by MARPOL) leads to a recovery in prices despite higher supply from US shale. OPEC concludes the cut deal in 2020 and grows slowly, offsetting disruptions in Iran, Venezuela and Libya. Post-2020, sluggish demand drives a new price decline.

### Stagnation and oversupply

Demand growth decelerates as trade wars and increasing economic nationalism leads to the end of this economic expansion. OPEC aborts efforts to support the prices and returns to defending market share. The US continues to produce helped by low break-evens.

### Potential mid-term Brent price scenarios

USD/bbl, 2017 real dollars



Source: Energy Insights, EIA

## We expect MARPOL and supply disruptions to sustain prices for the next two years, yet economic slowdown and OPEC policy remain key wildcards

Signpost ■ Key difference to base case	What you need to believe Opec control USD60-70	Impact on oil prices	What you need to believe Supply disruption continues USD80-90	Impact on oil prices	What you need to believe Stagnation and oversupply USD50-55	Impact on oil prices
 <b>Global oil demand</b>	End user demand growing at 1.0%p.a. and MARPOL adds ~0.5 MMb/d		End user demand grows at 1.0% p.a.; MARPOL and adds up to 1 MMb/d of demand		Sluggish end user demand grows at 0.8%p.a. and MARPOL adds up to 0.5 MMb/d	
 <b>Shale oil production</b>	Growth in the US continues, driven by rising well productivity and improved drilling efficiencies		Growth in the US continues, driven by rising well productivity and improved drilling efficiencies		US production continues to grow, albeit at a slower pace	
 <b>OPEC intervention</b>	OPEC cuts 2019 production to avoid oversupply scenario, but brings volumes back thereafter		OPEC does not have sufficient spare capacity to step in on time to avoid price fly-ups		OPEC maintains/increases production to defend market share	
 <b>Unplanned outages</b>	1 Venezuelan production goes below 1MMb/d 2 Sanctions hit Iranian output by ~0.5 MMb/d		1 Venezuelan production goes below 0.8MMb/d 2 Sanctions hit Iranian output by >0.9 MMb/d		1 Venezuelan production goes below 1MMb/d 2 Sanctions hit Iranian output by ~0.5 MMb/d	
 <b>New projects</b>	Cost compression is maintained in short term, supporting increasing FIDs		Cost compression is maintained in short term, supporting increasing FIDs		Cost compression is not enough to support increasing FIDs	
 <b>Non-OPEC (excl. US)</b>	Higher prices encourage upstream investment and bring legacy declines under control		Higher prices encourage upstream investment and bring legacy declines under control		Lower prices hit upstream investment and legacy declines accelerate	

## Mid to long term Up to 2035

### The dominance of field economics



## Summary

- We expect growth in oil supply to come from (1) OPEC, (2) US shale oil and (3) selected offshore basins e.g. Brazil that are breaking-even below USD75/bb; ample resource base and cost discipline keeps long term average prices at USD65-75/bbl
- The outlook is combined with a peak in demand growth in the early 2030s - driven by slower chemicals growth and peak transport demand as fuel economy, electrification, & reduced car ownership decreases oil consumption
- By 2035, under our base case E&P companies need to add >40 MMb/d of new crude production from mainly offshore and shale unsanctioned projects to meet demand, and ~4-5% of these new additions will come from YTF resources



# Short-term price scenarios have strong implications for the mid to long-term, linked by how much the industry will be investing in its future

OPEC CONTROL CASE

Short term scenario	Long-term price scenario <sup>1</sup>	What you need to believe	■ Deep dive follows
	<p>&gt;\$100/bbl</p>	<ul style="list-style-type: none"> <li>Major supply disruptions remove production permanently from the supply stack and shale oil declines proved to be higher than expected</li> <li>Strong demand growth in Asia and other non-OECD</li> </ul>	
<p>Stagnation and oversupply</p>	<p>\$80-90/bbl</p>	<ul style="list-style-type: none"> <li><b>Under-investment:</b> Years of underinvestment in exploration and infrastructure catch up with the industry, prices go up above USD80/bbl as OPEC does not have sufficient spare capacity to balance the market</li> <li>Dampened long-term demand growth</li> </ul>	
<p>OPEC control</p>	<p>\$65-75/bbl</p>	<ul style="list-style-type: none"> <li><b>New normal:</b> OPEC remains in control of the market balance. Oil prices remain stable with enough shale oil and offshore coming online at USD65-75/bbl</li> <li>Dampened long-term demand growth</li> </ul>	
<p>Supply disruption continues</p>	<p>\$50-60/bbl</p>	<ul style="list-style-type: none"> <li><b>Long-term oversupply:</b> Medium-term price fly-ups result in increased investments and FIDs in early 2020s. Due to this supply build-up, market gets into another wave of oversupply and low prices</li> <li>Dampened long-term demand growth</li> </ul>	
	<p>&lt;\$40/bbl</p>	<ul style="list-style-type: none"> <li>Technology disruption or significant factor cost adjustments drive down breakeven costs across multiple resource types to ~\$40/bbl levels</li> <li>Demand peaks earlier than expected</li> </ul>	

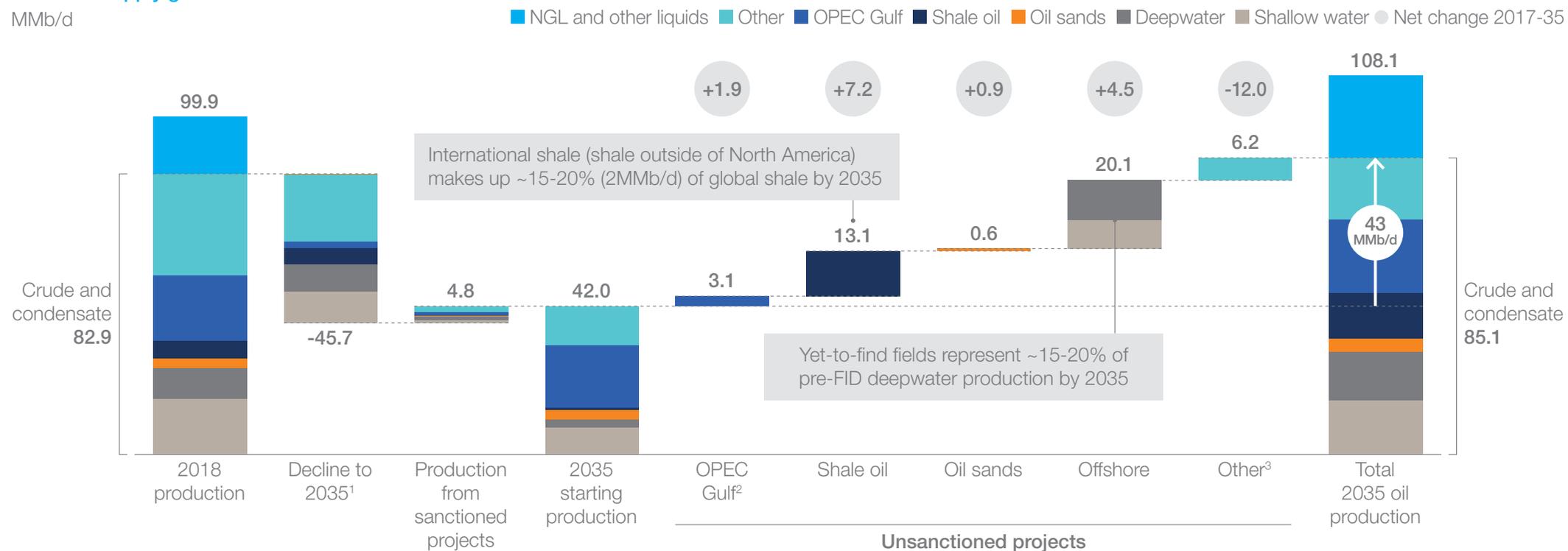
<sup>1</sup> Reflects Brent real prices Source: EIA, Energy Insights

# By 2035, under our base case E&P companies need to add 43MMb/d of new crude production from unsanctioned projects to meet demand

“NEW NORMAL” CASE

Global oil supply growth 2018-35

MMb/d



<sup>1</sup> This decline is net of in-fill drilling, and other work done to fields that are not classified as major projects <sup>2</sup> Does not include shallow water <sup>3</sup> Other includes onshore conventional, heavy oil, unconventional gas and excludes OPEC Gulf  
 Source: Energy Insights

# In our “new normal” case, new crude production is expected to come at a lower cost, with marginal supply breaking-even at USD 65-75/bbl

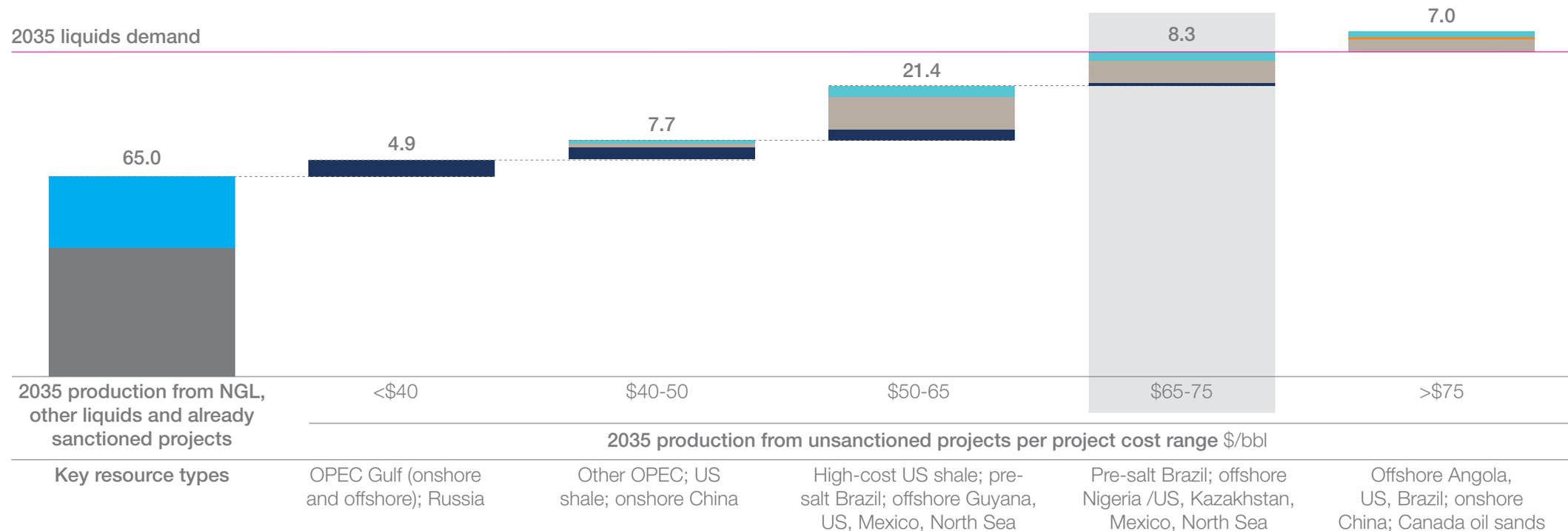
“NEW NORMAL” CASE

## Global liquids supply in 2035

MMb/d

Legend: Likely scenario price range, NGL and other liquids, Sanctioned projects, Conventional<sup>1</sup>, Oil sands, Offshore, Shale oil

### 2035 liquids demand



<sup>1</sup> OPEC's (excluding Nigeria and Angola) and Russia's breakeven costs exclude government take Source: Energy Insights

## There are five driving forces that combined define the cost of the marginal barrel and the prioritization of new projects

Signpost	Indicative impact on oil prices	What you need to believe in the 'new normal' case
 <b>1 Global oil demand</b>		<ul style="list-style-type: none"> <li>Global oil demand grows at a slower pace of 0.5% p.a. from 2020 until its peak in 2033, due to decreased road transportation consumption</li> </ul>
 <b>2 Non-OPEC production<sup>1</sup></b>		<ul style="list-style-type: none"> <li>Non-OPEC mature fields decline at 7.7% p.a. from 2018-35, with 4-5MMb/d production needed to be replaced annually from 2030-2035</li> </ul>
 <b>3 Shale oil production</b>		<ul style="list-style-type: none"> <li>US shale production will continue growing and reach ~12MMb/d by 2030 (~19.4MMb/d incl. NGLs), with production plateauing through to 2035</li> </ul>
 <b>4 New projects</b>		<ul style="list-style-type: none"> <li>Offshore break-evens benefit from cost discipline however some efficiency gains and discounts in services are lost, bringing up project costs to USD70/bbl particularly after 2030</li> <li>Argentina, Mexico and Russia shale oil projects economics benefit from technology improvement and learning curve</li> </ul>
 <b>5 OPEC intervention</b>		<ul style="list-style-type: none"> <li>We assume the cartel will manage supply to balance the market and avoid price fly-ups when needed with sufficient spare capacity</li> <li>OPEC is expected to maintain control and its market share at around 42% in the long run and increase it to ~44% by 2035</li> </ul>

<sup>1</sup> Excluding US

Long term Up to 2035

Accelerated energy transition: Disruption of liquids demand



## Summary

- A radical disruption scenario in road transport and chemicals sectors brings peak oil demand before 2025, and a ~30 MMb/d decline by 2035 compared to the Reference Case
- Liquids demand disruptions reduce the need for unsanctioned projects by ~50%, driving project cancellations and delays mostly in offshore regions and oil sands
- The reduced supply stack leads the average global crude slate to become more sour
- Lower oil demand could subsequently drive OFSE and refinery utilization down, with European refineries feeling the strongest impact; there could be further opportunities in decarbonization

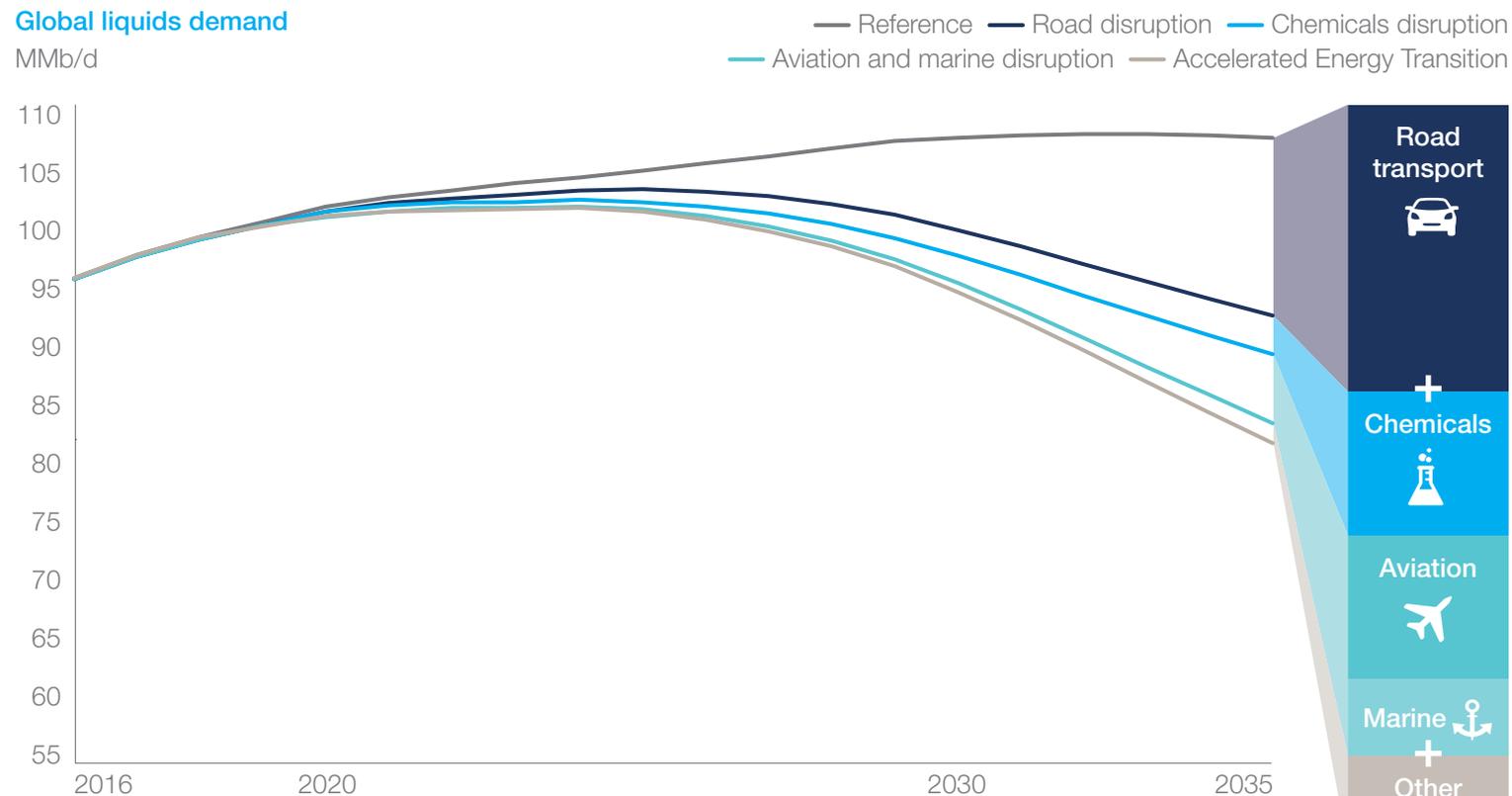


# Our Energy Transition scenario explores disruptive shifts in transport and chemicals that could bring a peak in liquids demand before 2025

“NEW NORMAL” CASE

## Global liquids demand

MMb/d



■ Reference Case ■ Additional in Accelerated Energy Transition case



### EV passenger car penetration

EVs as % of global new passenger car sales



### EV commercial vehicle penetration

EVs as % of global new truck car sales



### Plastics recycling

% polyethylene from recycled feedstock



### Alternative fuels uptake

% biofuels, natural gas, and electricity in the fuel mix



### Other

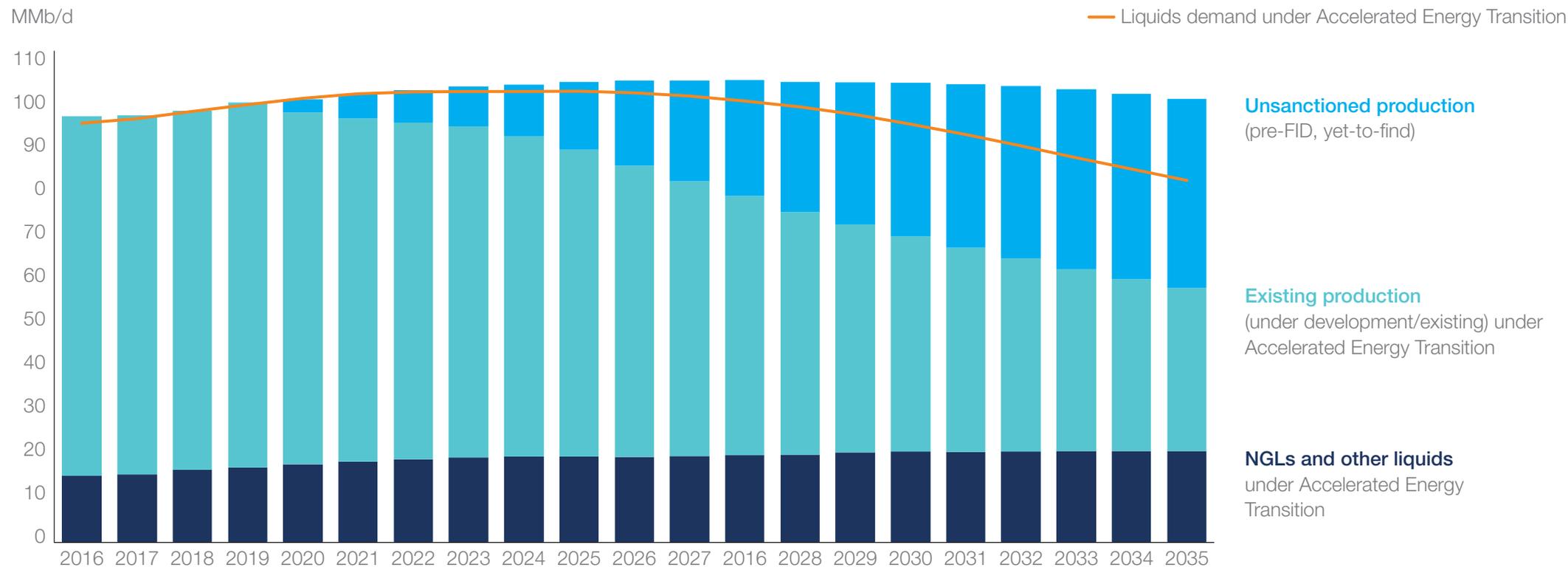
Heat and cooking electrification; industry electrification; and other transport and other energy sectors

Source: Energy Insights' Global Energy Perspective, January 2019

# As energy transition liquids demand declines, oil volumes produced in the future also decline, with reduced need for unsanctioned projects

ACCELERATED ENERGY TRANSITION CASE

Global liquids supply and demand under Accelerated Energy Transition case



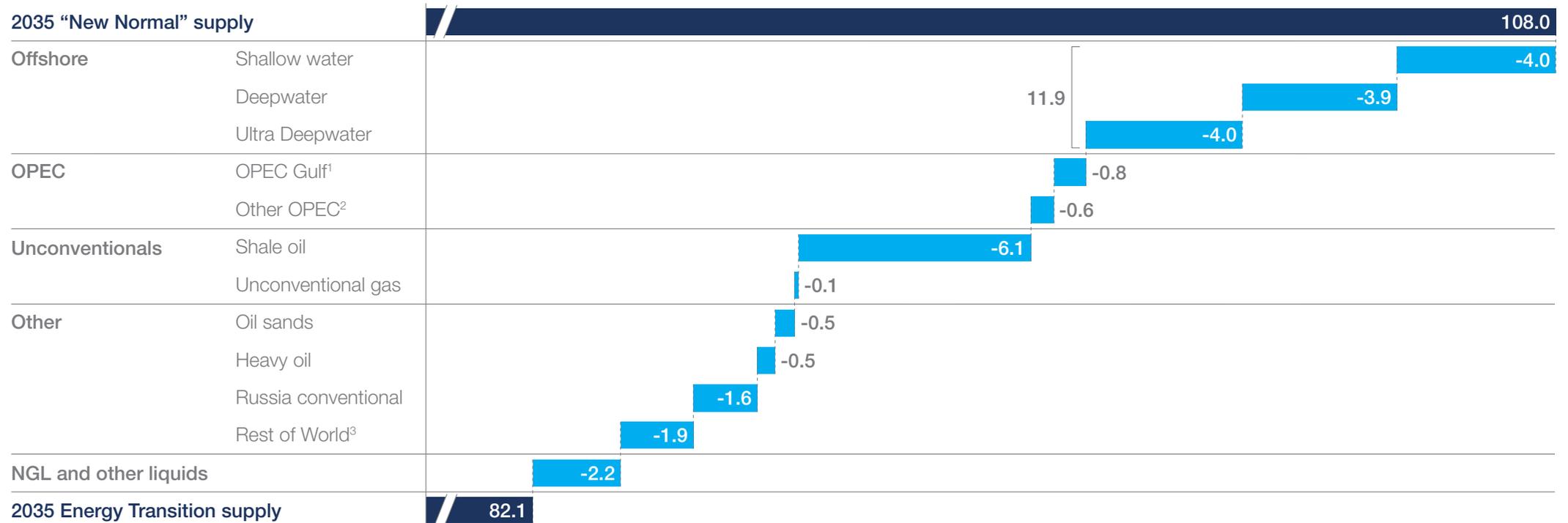
Source: Rystad Energy, Energy Insights

# The oil demand disruption will be absorbed by declines in all resource types, with offshore forfeiting ~12MMb/d of its base case growth

ACCELERATED ENERGY TRANSITION CASE

## Supply delta between 2035 “New Normal” and Accelerated Energy Transition cases

MMb/d



<sup>1</sup> Includes onshore conventional production <sup>2</sup> Includes onshore conventional production <sup>3</sup> Includes biofuels, MTBE, CTLs, GTLs, and refinery gains

Source: Energy Insights

## These demand disruptions have rippling effects in all oil-related industries, including the refining sector, OFSE and petrochemicals

- Upstream operators who sit on the unprofitable side of the oil cost curve will either structurally improve profitability, diversify their portfolio, or fold
- Low capex spend will directly hit the services industry, especially the providers who are not in the top quartile or well-placed geographically
- The refining sector could be at risk for structural underutilization given fixed capacity, leading into further capacity rationalization especially in Europe
- The decrease in plastics primary demand and increase in recycling will limit future activity in the petrochemicals industry, while the industry will need to re-focus its sources of feedstock as the supply hub landscape also changes
- Oil producer nations with low-cost resources should focus on encouraging the industry to invest locally through policy incentives, but also on sufficiently diversifying their economies for a post-peak demand world
- The energy transition could create opportunities for further decarbonization of the industry





## Methodology

The Global Oil Supply and Demand Outlook provides projections of the key trends in the global oil supply and demand market through 2035. These projections represent a reference case of the future market developed by specialists of Energy Insights with input from the experts and practitioners of McKinsey & Company's Global Oil & Gas practice.

The projections are not statements of what will happen but are the result of the modeling simulations of the integrated oil market system, based on a set of specific assumptions derived from the current legal, technological, and demographic trends.

## About us

We are a global market intelligence and analytics group focused on the energy sector. We enable organizations to make well-informed strategic, tactical, and operational decisions, using an integrated suite of market models, proprietary industry data, and a global network of industry experts. We work with leading companies across the entire energy value chain to help them manage risk, optimize their organizations, and improve performance.

For more information about our Global Oil Supply and Demand Outlook, please contact:  
[info\\_energyinsights@mckinsey.com](mailto:info_energyinsights@mckinsey.com)

[www.mckinsey.com/solutions/energy-insights](http://www.mckinsey.com/solutions/energy-insights)

© Copyright 2019 McKinsey Solutions Sprl

This report contains confidential and proprietary information of McKinsey and is intended solely for your internal use. Do not reproduce, disclose, or distribute the information contained herein without McKinsey's express prior written consent.

Nothing herein is intended to serve as investment advice, or a recommendation of any particular transaction or investment, any type of transaction or investment, the merits of purchasing or selling securities, or an invitation or inducement to engage in investment activity.

This material is based on information that we believe to be reliable and adequately comprehensive, but we do not represent that such information is in all respects accurate or complete. McKinsey does not accept any liability for any losses resulting from use of the contents of this report.



Energy Insights  
By McKinsey