
Presentation to the Payne Institute for Public Policy
Colorado School of Mines

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Unprecedented 20-30% shock to oil demand

Over 4 billion people under lockdown measures in April.

IEA estimates a 20 Mb/d shock in Q2, and a 9 Mb/d shock for 2020.

Source: BP (history), IEA (forecast)
Now, the market is gradually rebalancing

People are driving more...

...But jet fuel consumption lagging

Source: Apple, EIA.
As storage begins to decline again, prices to react

Inventories are beginning to draw, avoiding fears of reaching max storage capacity. Expect volatility from mismatch of demand and supply return speeds.

Source: Kayrros, MarketView
Supply was quicker to react than many expected

Rig decline sharper than the past

And frac crews are slowly restarting

But either way, the US will become a net importer again by EIA forecasts

Chg. in US Rigs from Beginning of Decline

Weeks

Chg. in US Rigs from Beginning of Decline

Weeks

Production Growth and Frac Spread Count

EIA: US Net Petroleum Balance (mb/d)

Sources: Baker Hughes, Primary Vision, EIA
US tight oil producers will focus on returns, free cash flow.

Productivity gains already slowing.

Ave. peak production per new well completed by vintage (b/d).

Producers no longer spending in excess of FCF.

Capex as % of FCF.

As spending contracts, so too will completions...

US tight oil spending and Completions.

Thousands of completions required for growth.

Completions vs Production Growth.
Sharp economic growth slowdown

Many factors will potentially restrain global economic growth.

Cyclical forces
- Limited scope for policy stimulus
- Government restrictions on activity during the COVID-19 pandemic
- Investor risk aversion

Structural forces
- Slowdown in labor-force growth
- Trade protectionism
- High public and private debt burdens
- Low productivity growth

Most regions will experience a severe recession in 2020

Source: IHS Markit
The oil shock compounds economic challenges

The oil price at which Saudi Arabia’s fiscal balance is zero exceeds $70/b in 2020 and remains sharply disconnected with current and 2021 oil price levels of $38/b and $42/b, respectively.

Source: IMF Regional Economic Outlook: Middle East – April 2020
Transportation plays a prominent yet diminishing role

60% of liquids consumption from transportation fuels

Liquids demand

<table>
<thead>
<tr>
<th>Mb/d</th>
<th>Power</th>
<th>Buildings</th>
<th>Industry</th>
<th>Non-combusted</th>
<th>Trucks</th>
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2010 2020 2030 2040

Liquids demand growth

Mb/d, average annual growth

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Cars include 2- and 3-wheelers. Trucks includes most SUVs in North America. Non-road includes aviation, marine and rail.

But the growth comes from non-combusted fuels
Short/Medium/Long term effects on transportation

Low fuel price, wealth shock to act as headwind to fuel economy improvement

US vehicle miles travelled (VMT): significant risk of lower fuel demand

Fuel economy change of new cars sold vs. Real Oil Price ($/bbl)

2017 NHTSA: Share of VMT

- Home based, 36%
- Work related, 21%
- Social/Recreational, 11%
- Shopping/Errands, 15%
- Medical/Dental services, 2%
- School/Daycare/Religious activity, 3%
- Something else, 2%
- Transport someone, 7%
- Meals, 6%

Source: TSE, EPA, MarketView

Source: NHTSA, ORNL
Covid-19: A non-linear catalyst for the energy system

Multiple questions concerning duration/magnitude of behavioral shifts, the speed of energy transition, and the level of supply/demand destruction

Short term (pre-vaccine)
- Load factor
- Mode shift
- More single use plastics
- Infrastructure spending
- Government stimulus
- Fuel price elasticity

Medium term (post-vaccine)
- Fuel economy gains suffer
- Lower scrappage rate
- Pent up demand
- Mode shift

Long term:
- Which ST&MT trends linger?
- Urban flight
- Deglobalization - reshoring

**Demand impact**

- Wealth shock/Employment
- Social distancing
- Lower PKM: business, leisure, work from home
- E-commerce

- Different leisure travel
- Higher scrappage rate
- Automation
- Consumer preference changes
- Labor intensity
- ‘Build back better’

- Consumer preference changes
- Business travel
- Slower economic growth
Wide variability in oil demand scenarios raises stranded asset concerns

Covid-19 will require review of transportation efficiency, technology and policy assumptions

New demand bypasses the refining system

Source: BP Energy Outlook 2019
Five aims to become a net zero company

Aim 1 Net Zero operations
Net zero on an absolute basis *across our entire operations* by 2050 or sooner

Aim 2 Net Zero oil and gas
Net zero on an absolute basis *across our upstream production* by 2050 or sooner

Aim 3 Halving intensity
50% reduction in the carbon intensity of *the products we sell* by 2050 or sooner

Aim 4 Reducing methane

Aim 5 More money for new energies

Five aims to help the world meet net zero

Aim 6 Advocating

Aim 7 Incentivizing employees

Aim 8 Aligning associations

Aim 9 Transparency leader

Aim 10 Clean cities
Aim 2 Net Zero oil and gas

Net zero on an absolute basis across the carbon in our upstream oil and gas production by 2050 or sooner

Portfolio management

CCUS

Blue hydrogen
(natural gas + CCUS)

Natural climate solutions