HSBC Global Research

1 June 2020

Oil & Climate Watch

It took a double black swan to knock climate off top spot

Equities
Energy

- Climate on industry back burner for now: we set out reasons why oil's transition may speed up or slow post COVID-19
- April oil demand of c75mb representative of 2040 2°C scenario levels, giving insight into scale of change to meet Paris goals
- Global CO_2 and energy spending to tumble in 2020; oil sands excluded, and low oil price set to cut US gas flaring

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Where does supply war and COVID-19 leave oil's relationship with climate? There are data points to support arguments that the current turmoil could either hinder or accelerate Big Oil's shift to a lower carbon future. We have discussed these in previous publications, including how European Integrated Oil Companies (IOCs) have continued to re-draw long-term climate strategies throughout the downturn.

Oil demand in April was at '2°C' levels: The collapse in oil demand during the COVID-19 pandemic has provided us with insight into the scale of the potential structural change in oil consumption needed for a 2°C world. While the c75m barrel of demand is aligned with the IEA low-carbon scenario in 2040, no climate model suggests implementing lockdown measures to curb emissions levels.

Global CO_2 to fall 8% and oil & gas to account for 75% of energy spending cuts in 2020: The IEA estimates that oil & gas spend will fall around USD250bn this year, (over 30% YoY drop) and renewable power spending is expected to decline less than 10%. While this helps re-balance investments when considering long-term climate objectives, the IEA sees the run rate of clean energy investment as too low.

Silver lining from lower US activity; falling flaring and methane emissions The sharp contraction in US land activity is having a noticeable bearing on flaring and methane emissions in North America, where recent research has labelled shale wells as some of the most CO_2 and CH_4 intensive in the world.

Institutional investors flex their exclusion muscles on oil sands: Some institutional investors have started excluding oil sands companies on the grounds of "unacceptable greenhouse gas emissions" at an aggregate company level. Average oil sand CO_2 intensity per barrel is around double the level of the European IOCs.

European carbon capture project gets green light, but much more is needed Long-term oil & gas consumption is to a degree reliant on wider carbon capture and sequestration (CCS) deployment. The USD675m Northern Lights project could be a future model where governments and oil majors jointly invest, however, global CCS capacity will need to increase by as much as 40x from current levels to reach climate goals.

The following is a redacted version of a report published on 01 June 2020.

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Climate off top spot, for now

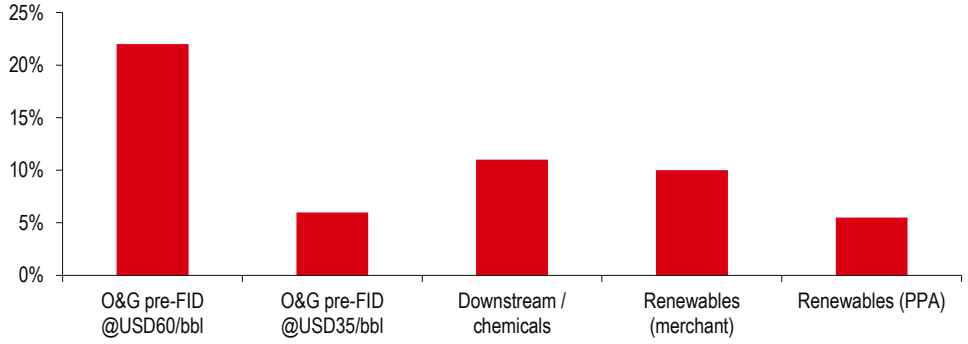
- Climate has taken a backseat to current market volatility, but we think it will be back as oil's most pressing long-term strategic issue
- Debate is raging over how the industry transition will develop following the crisis – we highlight some factors up for discussion
- Global CO_2 set to fall for first time in over a decade, but energy investment trends remain misaligned with Paris goals

COVID-19 and oil price crash, transition accelerators for (Big) Oil?

Some reasons to think the transition will pick up speed from here…

- **More long-term strategies:** European IOCs have been expanding their long-term climate ambitions during the current turmoil and OGCI members have re-affirmed commitments.
- **Tough dividend decisions are being made:** In the face of unprecedented volatility, some companies chose to cut their dividends by two-thirds. We have previously discussed the potential need for industry dividend rebasing.
- **A levelling of the playing field:** Lower oil prices have an effect of equalising expected returns from upstream oil & gas and non-hydrocarbon ventures (see chart below).
- **Capex cuts:** Deep spending cuts have primarily meant oil & gas project sanction delays, which could put some planned upstream growth on hold.
- **Demand:** Some areas of oil consumption could recover gradually such as air fuel, raising the possibility that peak demand may have been brought forward.
- **Policy:** Some countries/cities are bringing forward decarbonisation policies and restrictions on vehicle use.

Average IRRs across different energy investments are more similar at USD35/b than at USD60/b



Source: Wood Mackenzie, HSBC estimates

…and some reasons to think the transition may slow

- **Budget cuts (again):** With company spending plans under the spotlight, it is possible that new energies investments will be included in sharp company capex cuts.
- **Policy distraction:** Decision making in some jurisdictions could focus on the post-COVID economic recovery at the expense of energy transition focused investment – e.g. support to areas of the economy linked to oil & gas production / consumption that are large employers.
- **Rebound effect:** There is an age old theory that once the price of a commodity falls, more of it is demanded, potentially spurring price sensitive industries/countries to increase consumption. While not always direct substitutes, lower natural gas and oil prices could stifle broader fuel switching or influence energy infrastructure investment decisions.
- **An oil price bounce:** As crude markets re-balance, a reversion of prices to levels more attractive to producers could mean that the current turmoil is only seen as a temporary interruption to medium-term growth plans for some operators.
- **Uncertainty.** A worsening of visibility of future trends may delay some operators from exploring new ventures, instead preferring to stick to what they know best.

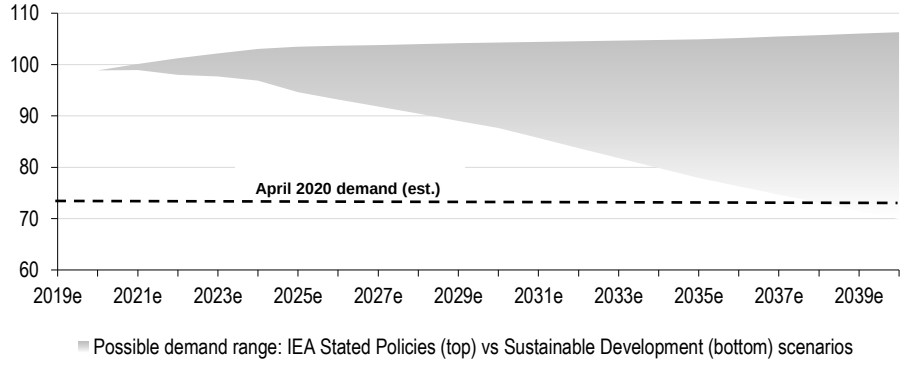
Oil demand in April was in line with 2040 low-carbon scenarios

Ever wondered what a 2°C oil market looks like? April gave us a glimpse

At the expected trough in oil demand during the ongoing COVID-19 pandemic, consumption reached an estimated 75m barrels a day, consistent with 2040 levels in the IEA Sustainable Development Scenario, which models an energy system consistent with the goals of the Paris Agreement (see chart below).

Oil demand is already recovering and while the c25% reduction in consumption is expected to be a temporary phenomenon, it does highlight the scale of structural change in demand needed to meet global climate goals. No energy-system model that is calibrated to achieve a given climate result advocates global and domestic travel restrictions like we have seen recently as lockdowns have prohibited hundreds of millions from accessing transport. However, the scale of (involuntary) action to produce such a reduction in global oil demand is indicative of the potential future change that an energy system may need to undergo to limit global temperature rises (notwithstanding future technology changes). As we have discussed in previous reports, we see policies that target oil consumption as the most effective tool in shaping future demand levels.

Future global oil demand ranges – BAU vs 2°C pathways (million barrel a day)



Source: IEA, HSBC estimates.

Other recent oil, gas and climate developments

Natural gas – switching from coal is crucial in short-medium term but high levels of gas flaring is problematic

US flaring falling with lower shale, Poland undergoing fuel switch from coal to gas

Meanwhile, in the US shale patch, lower WTI oil prices have meant that activity in the field has entered a period of sharp decline, leading to lower volumes of flared gas. US production is currently being curtailed through a combination of well shut-ins and lower drilling and completions – some of these will be quick to return as and when prices improve, others will be slower to do so. The flaring of natural gas appears to have peaked in February, just before the sharp oil price correction and ensuing slowdown in activity. Flared gas volumes have fallen over 20% and are likely to reduce further – the magnitude of change will depend on how US shale production develops over the coming months.

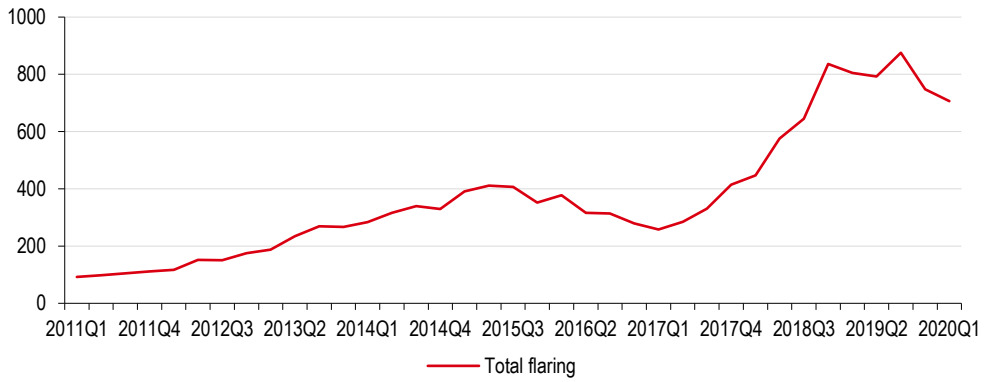
CCS and safe handling of natural gas are important to its long-term future demand

Flaring of natural gas is a function of several factors, including the level of overall activity/output, accessibility to transport infrastructure/pipelines, local regulations, operating company approach to routine flaring, local market prices for natural gas and health & safety in operations. Flaring from US shale has attracted attention of late due to the rapid expansion of production in recent years and the lack of incentives to capture or use gas (due to a combination of somewhat looser regulations, low Henry Hub prices and the fractured nature of the US shale industry), which led to a tripling in volumes flared from early 2017 to February 2020.

Natural gas' role in the energy transition as a 'bridge' or 'destination' fuel does rely on technology developments to lower its carbon footprint (such as CCS), but also operator and customer stewardship of the fuel – methane emissions leaks/venting and flaring reduce natural gas' edge over other fuels (primarily coal) from an emissions perspective.

Plummeting US shale well drilling and completion activity is sending Permian gas flaring levels lower

Permian flaring levels falling with lower activity (million cubic feet/day)



Source: Rystad Energy

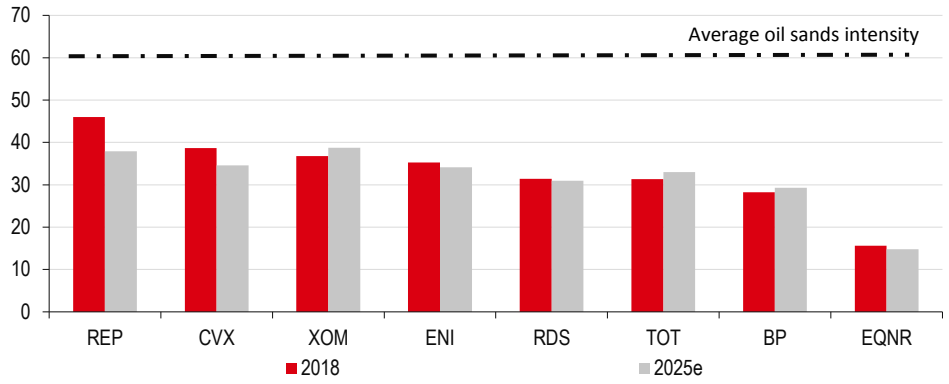
There is evidence that, during the COVID-19 pandemic, Polish utilities are switching away from coal in favour of natural gas (including LNG) – data from the national grid operator showed an over 25% YoY increase in gas-fired generation and a similar fall in coal-fired power. Polish electricity generation has been among the highest emitting industries in the EU in recent years.

Some institutional investors are now excluding oil sands operators on emissions grounds

Institutional investors have started excluding Oil Sands from portfolios

Some institutional investors have started to exclude companies engaged in oil sand production in from their portfolios on the grounds of "unacceptable greenhouse gas emissions" at an aggregate company level. These companies represent a fraction of the size of a typical IOC – and therefore emit much less overall direct absolute CO2. However, on a per barrel basis, the average emissions intensity per barrel (CO2/bbl) among the companies excluded is 60kg, or approximately double the level of IOCs (see chart below). By its nature, oil sands are more CO2 intensive to extract and refine and The Carnegie Endowment for International Peace estimates that some oil sands resources can produce lifecycle emissions that are over 60% higher than lower-CO2 sources. Some excluded companies state they have been reducing emissions intensity of production in recent years and have further targets/initiatives to decrease CO2 per barrel further, such as by investing in CCS.

Oil sands emissions intensity per barrel is roughly double that of European IOCs



Source: Wood Mackenzie, company data

Oil operators and utilities' long-term plans rely on a lot more CCS investment

Northern Lights CCS – a long time in the making

Carbon capture and sequestration (CCS) is a key technology through which oil & gas use can be decarbonised and, as a result, future hydrocarbon demand could be linked to the pace of CCS deployment (as a method of storing the produced CO_2). Climate-energy models often also rely on the notion of 'negative emissions' – that utilise CCS combined with biomass-fired power generation to reduce future cumulative CO_2 levels while maintaining energy supply.

Due to a number of reasons, including policy indecision and the scale of investment needed, the development of commercial CCS has been painfully slow to date. The USD675m Northern Lights project, which will capture 1.5m tonnes CO_2 annually from industrial sectors and store it in the North Sea, is Big Oil's latest venture in the space. Crucially, the project is backed by the Norwegian Government – policy support has often served as a roadblock in previous attempts to get similar projects to final investment stage.

Different climate models assume varying rates of required CCS deployment in future energy systems, however, almost all that achieve the goals of Paris see the need for significantly more carbon capturing and some assume removal of over 2 gigatonnes CO_2 pa (over 40x the current global capacity of around 50m tonnes CO_2 pa).

Separately, KBR was recently awarded a feasibility study for CCS infrastructure and blue hydrogen production relating to oil and gas fields in South East Asia.

The expected 2020 CO_2 drop is 6x higher than the fall from the global financial crisis

2020 emissions, energy demand and investment to fall, oil facing sharpest decline

The recent IEA's World Energy Investment report produced some 2020 forecasts that were unthinkable earlier this year: global CO_2 emissions are set for an almost double-digit percentage drop (c8%) and energy spending is set to be down across the board (20% fall in total).

Oil is the single most impacted energy source on both the demand and investment side due to the effects of current transport restrictions and the sharp falls in its price. Coal is highlighted as the second most impacted fuel, but spending on renewable energy is also expected to fall by around 10% this year – taking investment back to 2017 levels. As a result, despite the first annual decline in carbon emissions in a decade and clean energy's share of total spending expected to rise in 2020, the COVID-19 crisis is resulting in renewable power investment trends further deviating from the run-rates required to drive a transition in line with global climate goals. In the IEA's Sustainable Development Scenario, renewable power investment would need to double from the roughly USD600bn in recent years by 2030.

Climate resolutions remain a regular feature of US oil & gas AGMs

Oil & gas company AGMs remain battle grounds for climate plans

A long running saga between US oil & gas companies and shareholders regarding the former's actions and commitments to tackle climate change continued this year at AGMs. In recent AGMs, investors have supported motions to separate the roles of CEO and Chairman at oil & gas companies in what has been interpreted as a protest resolution in lieu of an explicit vote on companies' climate change commitments. Shareholders have also backed resolutions requesting that companies disclose lobbying activities with respect to climate change. In contrast, some European oil & gas companies avoided AGM votes this year on climate through engagement with investors and announced revised long-term ambitions.

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1. This report was produced and signed off by the author on 29 May 2020 10:00 GMT.

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