

Global Oil Production and Storage Forecast

Summary

This paper examines the impact of Covid-19's unprecedented oil demand destruction coupled with the 12th April agreement to enact unprecedented production curbs. The paper presents a global production and OECD crude storage forecast and analyses the impact on US onshore activity and production.

The forecast is based on oil demand falling to 70 MMbbl/day in April 2020 and returning to 2019 levels in 2021, rising at historic rates from there. Under this scenario, the following outcomes appear likely.

- Oil inventories will continue to build through July 2020, they will not overwhelm OECD storage globally, but could force production shut ins at a regional level.
- US onshore oil rig counts fall to 300 in 2020, US oil production falls to 14.7 MMbbl/day in 2020
- OECD oil inventories fall to five-year average in 2021.
- US oil production falls to 13.3 MMbbl/day in 2021, onshore oil rig count is flat.
- Increased US onshore oil activity is unable to meet increased demand in the medium term.
- Crude supply gap reaches 2 MMbbl/day in 2022; heavy inventory drawdowns required to balance the market.

This scenario would see a strong rebound in pricing in late 2021 and into 2022 as surplus inventory is worked off and supply falls short of demand. US onshore production growth would be unable to keep pace triggering the start of the industry's next investment cycle.

Oil Supply and Demand

Lenin wrote, "There are decades where nothing happens; and weeks where decades happen." The words seem apt given how much has happened over the last month, to the world in general as well as in the oil markets.

On the demand side, the IEA's March report predicted essentially flat oil demand in 2020 compared to 2019, based on a strong demand rebound in the second half of the yearⁱ. The April update is far less sanguine, with much deeper demand destruction in the first half of the year and no recovery to 2019 demand levels even at year endⁱⁱ. I estimate average oil demand for 2020 could be as low as 88 MMbbl/day, 12 MMbbl/day below the average for 2019.

On the supply side are the production curbs agreed by producer nations at their meeting of 12th April. I estimate these production cuts at nearly 16.6 MMbbl/day in May 2020, against the elevated April 2020 production level of over 103 MMbbl/day. This is the largest voluntary oil production cut in history. Incredibly, it still does not balance the market.

Oil Market Balance and Storage

The net result of this historic decline in demand and curb in supply is that inventories will build more slowly until August this year, at which point recovering demand should start to deplete them. A supply and demand and surplus forecast through 2023 is shown in Figure 1, below.

The key uncertainties in this forecast are the pace of global economic recovery, adherence to production cuts, the ongoing application of US sanctions, involuntary supply interruptions in Libya and the underlying decline rate of US shale production.

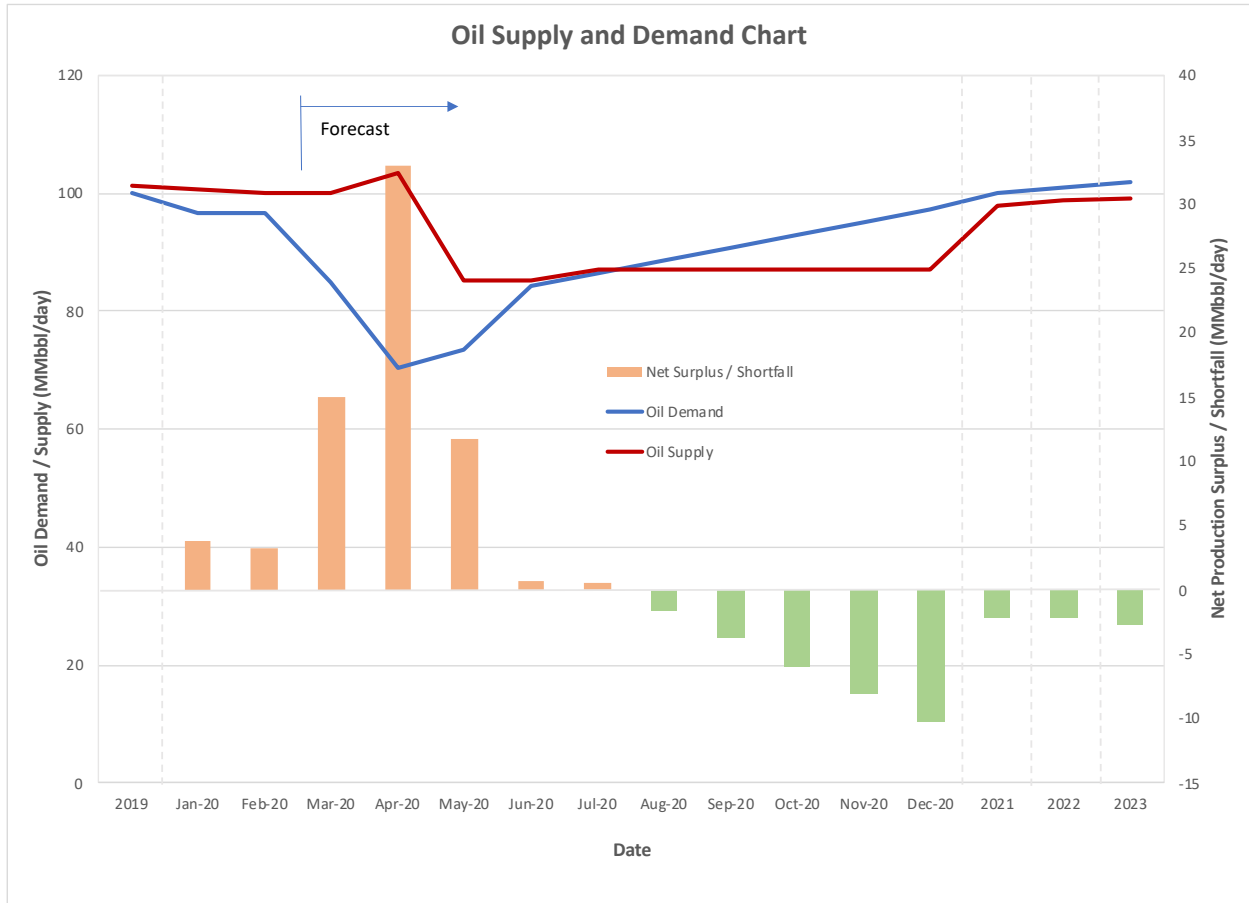


Figure 1 - Supply and Demand and Surplus Forecast

March and April crude surpluses are estimated at 15 MMbbl/day and 33 MMbbl/day respectively, which would result in 1485 MMbbl. being added to storage over the two-month period. The production cuts enacted by producing nations should slow the build in crude inventories, but surplus supply is likely to approach OECD storage capacity in July and August this year, before falling back slowly as demand returns. This is shown in Figure 2, below.

Not all storage facilities are accessible by all crude producers; some regions will reach physical storage capacity and some will not. The increasing spread between WTI and Brent may indicate that US spare storage capacity will be exhausted first.

Crude oil in OECD storage is not forecast to reach 5-year average levels until 2021, at which point the industry should start to see higher prices. An uptick in US shale activity in response to those signals is not likely to be enough to offset the increasing supply gap and so 2022 and 2023 could see substantially higher crude oil prices in response to a physical supply shortfall.

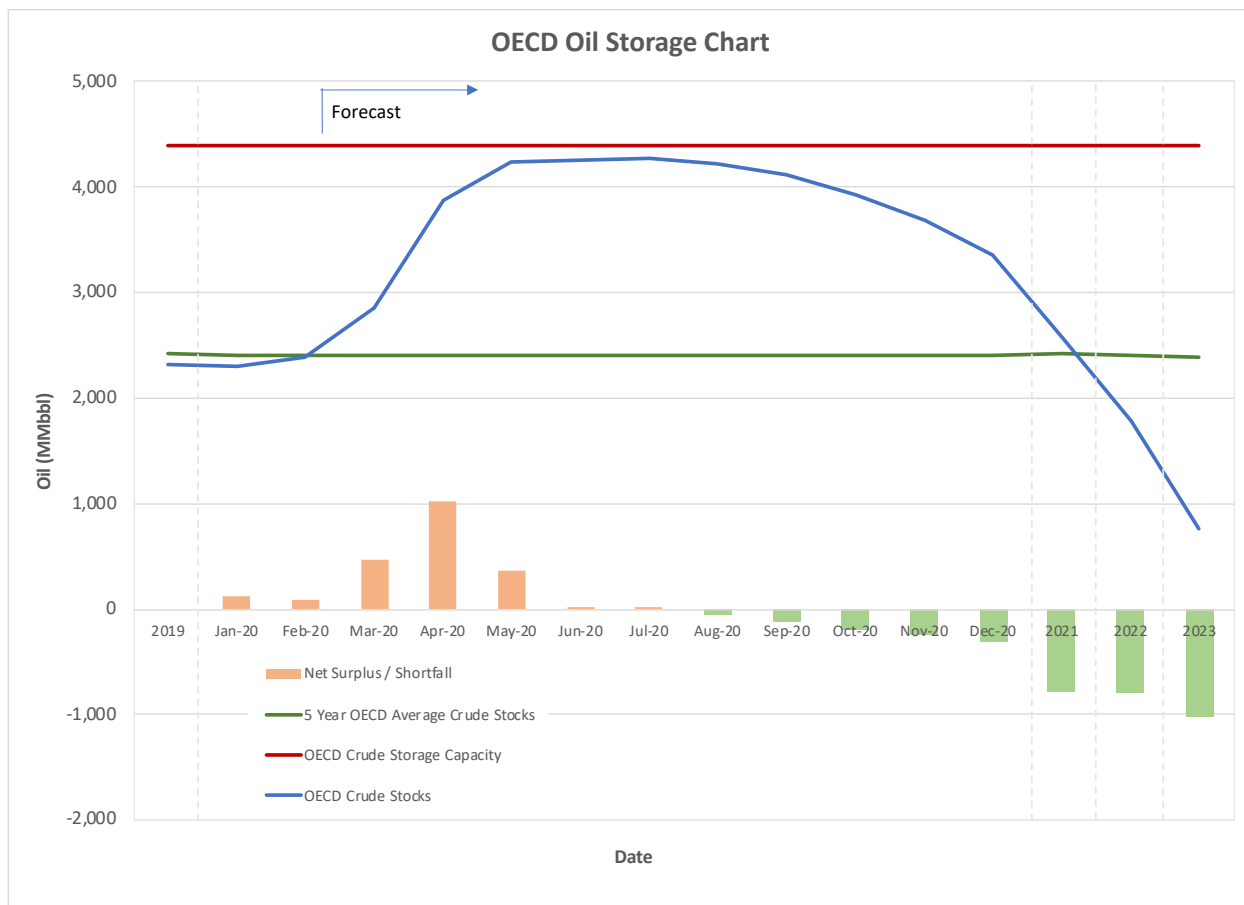


Figure 2 - OECD Oil Storage Chart

Impact on US Investment and Production

The forecast sees average annual US oil rig counts falling to 300 in 2020, staying flat at 300 in 2021 before recovering. The 2020 rig count estimate is essentially the same as last month's forecast, but the 2021 rig count is higher. The market will rebound more quickly as the OPEC and non-OPEC production curbs result in accelerated depletion of the stored surplus.

The impact of investment cuts in 2019 and 2020 is undoubtedly going to influence the health of the services industry, restricting its ability to grow rig count quickly when demand returns. US oil rig counts and new wells are shown in Figure 3, below.

US annual oil production is forecast to fall from a record 17.2 MMbbl/day in 2019 to 14.7 MMbbl/day in 2020 bottoming out at 13.3 MMbbl/day in 2021 and 2022 before returning to growthⁱⁱⁱ. US oil production is shown in Figure 4, below.

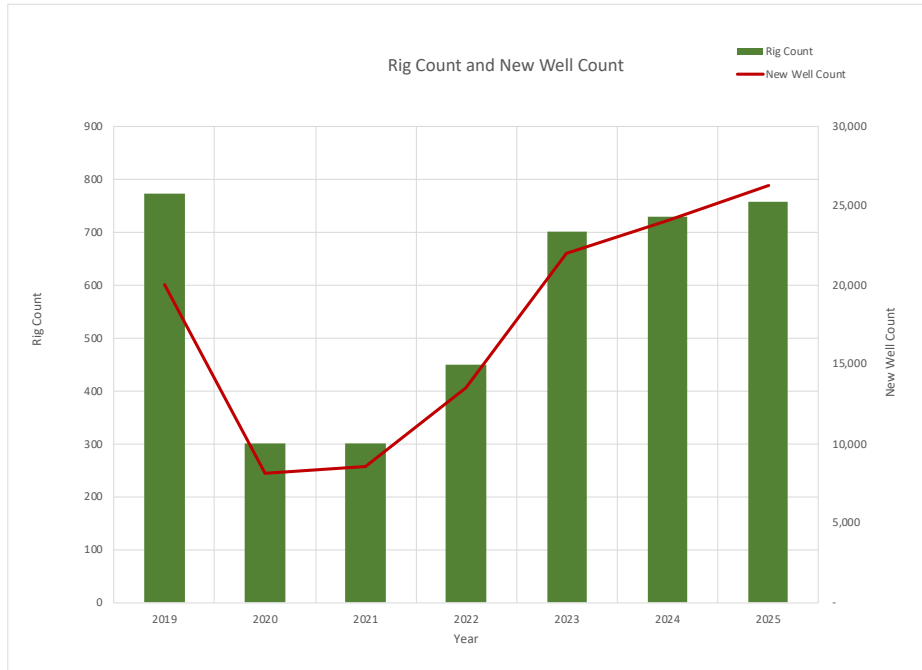


Figure 3 - US Rig Count and Well Count

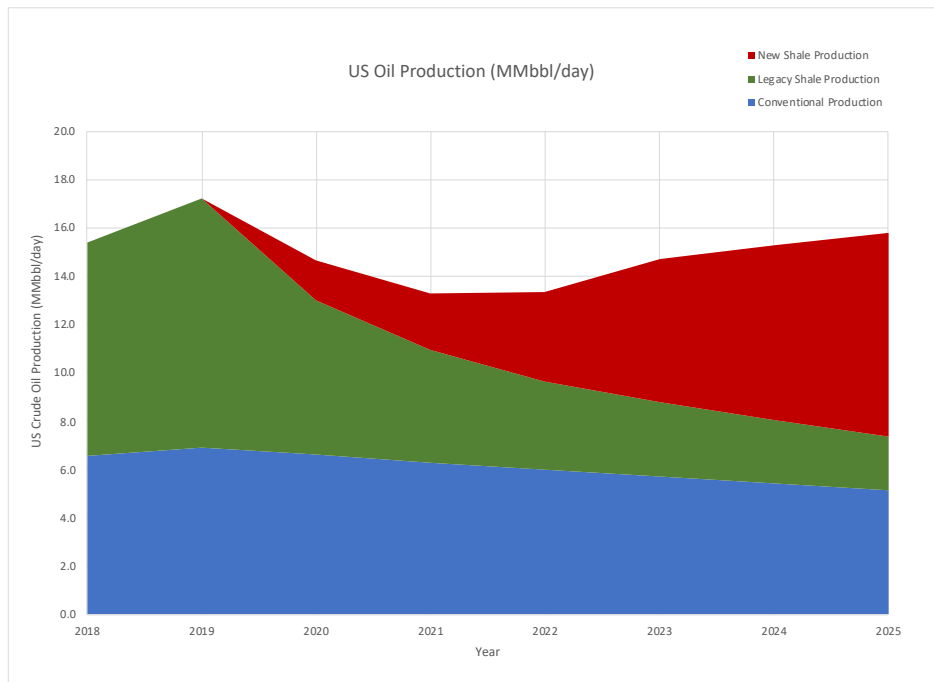


Figure 4 - US Crude Oil Production Forecast

ⁱ IEA (2020), Oil Market Report - March 2020, IEA, Paris <https://www.iea.org/reports/oil-market-report-march-2020>

ⁱⁱ IEA (2020), Oil Market Report - April 2020, IEA, Paris <https://www.iea.org/reports/oil-market-report-april-2020>

ⁱⁱⁱ Previous US production forecast models have used crude oil only, the current forecast uses oil (crude oil plus NGL) for compatibility.