

COVID-19's Impacts on Utah's Oil & Gas Industry

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At the onset of the COVID-19 pandemic, the oil and gas sector was caught unprepared for the global shock of diminished energy demand by shelter-in-place and stay-at-home policies.

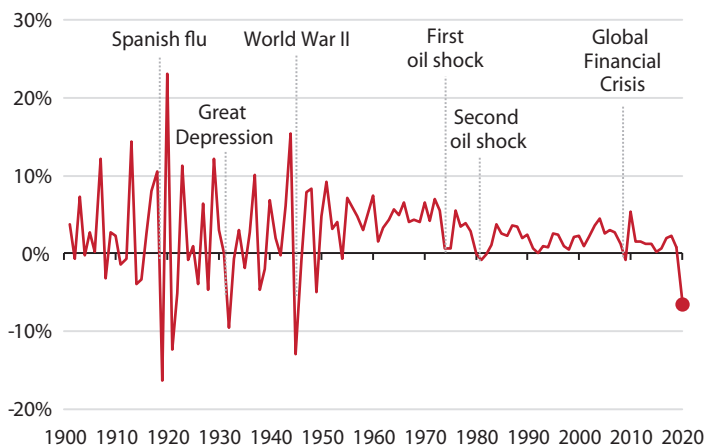
The magnitude of the coronavirus shock to energy demand is forecasted to be the largest in the seven decades since World War II.

A crude oil supply shock and an energy demand shock, caused by COVID-19, occurred in March 2020. On the supply side, members of the Organization of the Petroleum Exporting Countries (OPEC), along with their partners in the larger OPEC+

group, failed to reach agreement on crude oil production targets in March. Saudi Arabia, the de facto leader of OPEC, had previously adjusted its own production levels to accommodate the hard currency needs of other cartel members.

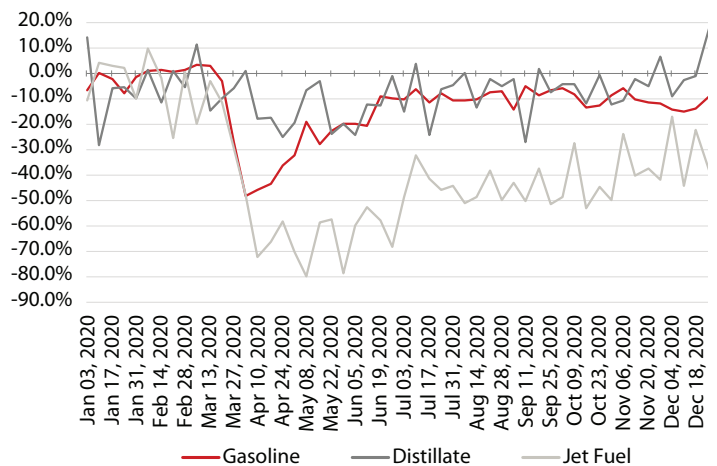
COVID-19 supply and demand shocks affected the price of West Texas Intermediate (WTI), the marker crude oil for the western hemisphere.

Figure 1: Annual Change in Global Energy Demand, 1900-2020



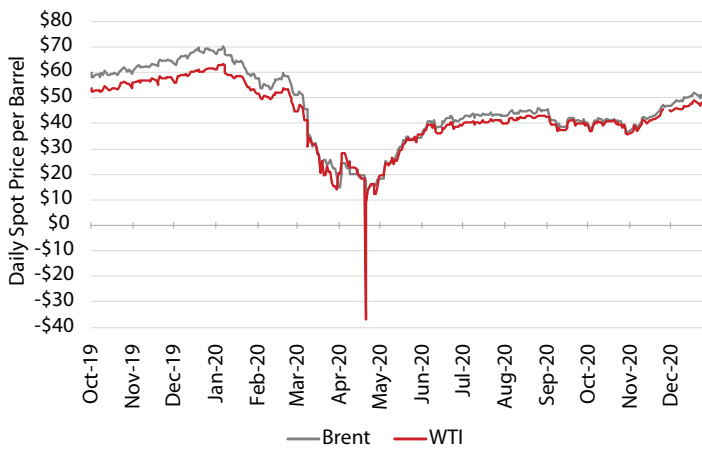
Source: International Energy Agency, Global Energy Review 2020

Figure 2: Year-Over Change in United States Petroleum Consumption, 2020 vs. 2019



Source: U.S. Energy Information Administration, U.S. Weekly Product Supplied

Figure 3: Global Oil Prices Plummet



Note: Brent is the marker crude for the eastern hemisphere.
Source: Energy Information Administration

regional crude oils. For example, Utah’s Uinta Basin waxy crude oil value is set at a differential to WTI based on sulfur, API gravity, and metals content. While Uinta Basin waxy crudes do not have

sales outlets in the mid-continent, Utah crude oils are priced on their quality differential to WTI. Figure 3 shows the precipitous drop in crude oil prices during March and April.

Coronavirus’s Impact on Utah Oil and Gas Producers

The curtailed crude oil demand, coupled with global crude oil oversupply, put stress on the business models of oil and gas producers. However, the wide diversity of their business models affects producers’ ability to respond to and survive the current crisis.

At one end of the spectrum are the government-directed producers such as Saudi Arabia and Russia, with large hard-currency reserves to sustain a price war or period when oil prices fall below production costs. Russia is believed to have a \$430 billion war chest compared to Saudi Arabia’s \$490 billion.¹

At the other end of the spectrum, oil and gas producers in the United States fall into three categories:

- Vertically integrated majors such as ExxonMobil and Chevron have large portfolios, enabling them to take a long-term view of allocating resources at different geo-

Why Did West Texas Intermediate Crude Oil Prices Go Negative on April 20?

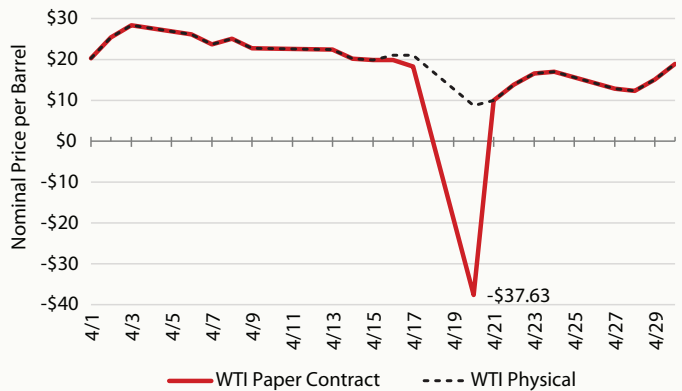
The crude oil markets suffered a supply shock when a glut of oil entered the market due to a dispute between Saudi Arabia and Russia over global market share. Compounding the supply shock was a demand shock caused by COVID-19 reducing demand for motor gasoline and jet fuel. Too many barrels of crude oil overwhelmed diminishing demand, causing WTI prices traded by hedgers and speculators to fall into negative territory on April 20 (see Figure 4).

Crude oil trades on a physical market in which buyers and sellers exchange barrels of WTI crude oil by pipeline, rail, or ship.

A “paper” crude oil market exists on the Chicago and New York Mercantile Exchanges for the benefit of speculators and hedgers (i.e., people seeking to lay off risks of price changes). Each paper contract requires either the delivery or receipt of 1,000 barrels of WTI crude oil into Cushing, Oklahoma, tank storage. Speculators and hedgers close out their paper contract positions on the last day of the trading month to avoid accepting or delivering physical barrels of WTI.

What happened on April 20? A few speculators or hedgers who *bought* paper contracts of WTI did not have storage space to take delivery of physical crude oil barrels. Cushing, Oklahoma’s storage capacity of 76 million barrels was full due to the crude oil glut. When these unfortunate speculators and hedgers *sold* their WTI paper contracts, they paid buyers a premium of \$37.63 per barrel in order to close out their paper contract positions.

Figure 4: West Texas Intermediate Physical and Paper Contract Prices, April 2020



Source: U.S. Energy Information Administration; S&P Global Platts

Did the value of physical WTI crude oil go negative? No. The figure shows the divergence of WTI paper contract prices from WTI prices on the physical market. Values for physical crude oil remained positive while the WTI paper contracts market tanked.

Under normal conditions, physical market prices converge with the paper market prices on the last day of the trading month. However, in this extreme case, a few speculators and hedgers learned a costly lesson about closing out their paper contract positions well before the final day of the trading month.

graphical locations and points along the hydrocarbon value chain. Their portfolios include exploration and production, midstream pipelines, and downstream refining assets.

- Large and medium-size exploration and production companies work with larger capital budgets allocated across multiple geographical regions.
- Small exploration and production companies are often focused on one basin, with limited alternatives to market crude. Often companies in this category are thinly financed and need to produce to survive. Many Uinta Basin companies fall into this category.

Of the Uinta Basin producers, Ovintiv, EP Energy, Finley Resources, Berry Petroleum Company, and Caerus have operations in other U.S. basins as well. However, some producers rely solely on their Uinta Basin activities to provide cash flow.

During periods of reduced revenue generation, companies rely upon their balance sheets to weather financial crises, with the greatest exposure borne by the smaller exploration and production companies.

Setting aside any contractual obligation of a producer to make monthly deliveries to a buyer, each producer must take account of its operational production costs, including:

- Lifting costs: costs to operate and maintain wells and related equipment and facilities.
- DD&A: Depreciation, Depletion, and Amortization. Depreciation is the systematic expensing of the cost of buildings, equipment, and vehicles. Depletion is the systematic expensing of the cost of natural resources. Amortization is the systematic expensing of bond issue costs and organization costs.
- G&A: General and Administrative expenses, including wages, rents, and utility costs.

The Federal Reserve Bank of Dallas recently surveyed 95 oil producers in six U.S. basins about the minimum West Texas Intermediate (WTI) price needed to cover operating expenses. Average responses ranged from \$23 to \$36 per barrel. Variation among basins in the minimum viable WTI crude oil price is expected due to basin-specific geologic and stratigraphic features. However, variation in the minimum viable WTI price within a given basin was also large (see Figure 5). A possible explanation is the size of the company and field acreage, each contributing to economies of scale.

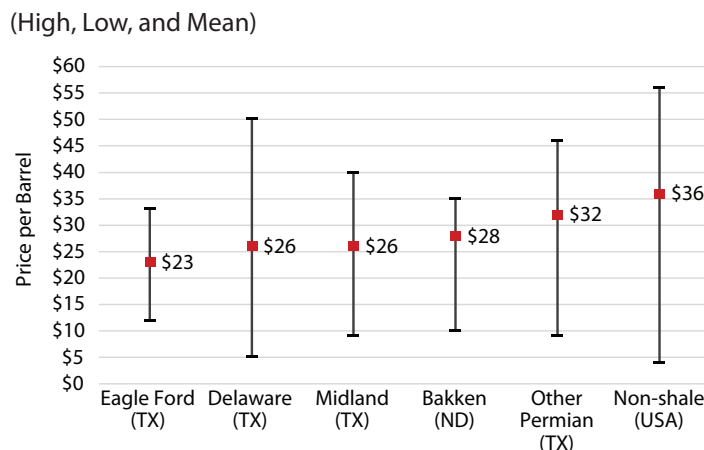
Utah waxy crude oils incur additional costs to crude oils produced in the basins shown in Figure 5. These additional costs arise because of the following:

1. Utah waxy crudes' high paraffin content requires insulated trucking, which is more expensive than pipeline transport.
2. Refineries processing Utah waxy crudes require additional upgrading units. As a result, many refiners demand a discounted price.

Utah waxy crudes have received approximately a \$12.50-per-barrel discount to the benchmark WTI crude in 2020. Applying this \$12.50 to the range of average minimum viable WTI prices in other basins, the WTI breakeven price needed to cover Uinta Basin operating expenses would be \$36 to \$49 per barrel. Since March 2020, WTI prices have been below the upper threshold, \$49 per barrel, presenting some Uinta Basin producers with difficulties in covering operating expenses (see Figure 6).

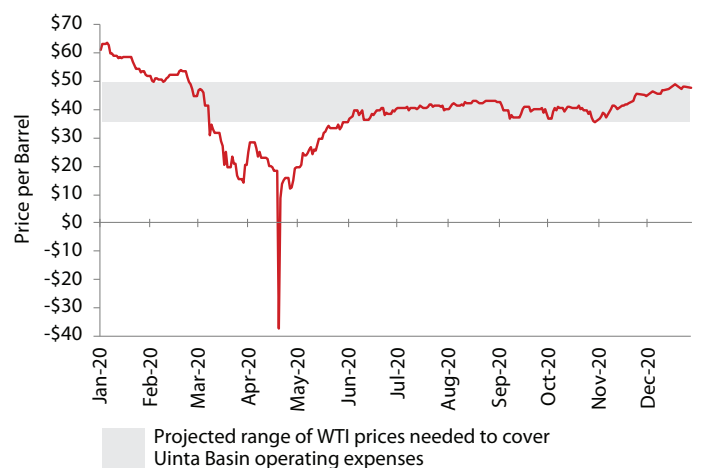
When oil prices fail to cover operating expenses, negative cash flows force producers to furlough employees, reduce oil production, or shut-in wells until prices rebound. Companies with thinly financed balance sheets will react immediately to lower crude oil prices.

Figure 5: WTI Prices Needed to Cover Operating Expenses in Selected U.S. Oil Basins



Source: Federal Reserve Bank of Dallas. Survey polled 95 exploration and production companies with the question, "What WTI oil price does your firm need to cover operating expenses for existing wells?"

Figure 6: West Texas Intermediate Crude Oil Prices in 2020



Source: Energy Information Administration (Cushing, OK WTI Spot Prices FOB)

Employment Impact

The Department of Workforce Services has been tracking unemployment insurance claims in Utah during the COVID-19 pandemic. Qualified recipients must meet state-mandated thresholds for either earned wages or time worked in a stated base period, as well as a determination that the recipient is unemployed through no fault of their own. Figure 7 shows seven counties in Utah with the highest insured unemployment rates at the onset of the pandemic.

- Employment declines in the leisure/hospitality sector were the primary contributor to the insured unemployment rates of Wasatch, San Juan, Grand, and Garfield counties.
- Declines in the natural resources sector were the chief contributor to insured unemployment rates of Uintah and Duchesne counties. One thousand people in the natural resources sector were laid off. However, this unemployment rate is understated because

unemployment insurance claims exclude self-employed workers. Within the oil and gas workforce, self-employed workers account for up to two-thirds of total jobs.

- Declining manufacturing employment in Tooele County contributed to its 9.2% rate.

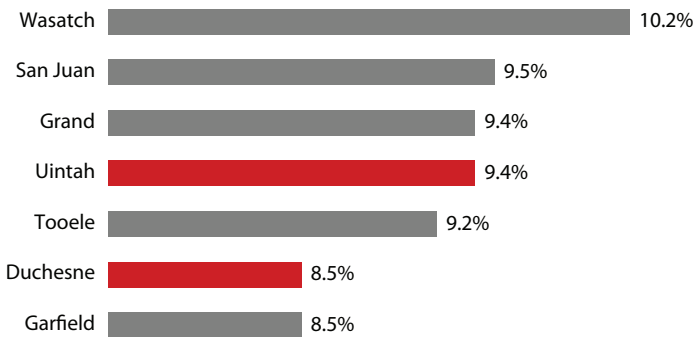
Total covered nonfarm employment dropped in Uintah and Duchesne in April 2020 to 11,394 and 7,476, respectively—12.5% and 4.3% below their levels a year ago. Uinta Basin employment has recovered somewhat since then, but as of September 2020 it was still down by 9.0% in Uintah and 7.4% in Duchesne from last year.

Shut-In Oil and Gas Production

As crude oil prices have slumped, international oil and gas companies have taken asset write-downs, also known as impairments, in response to the expectation of lower crude oil prices. British Petroleum and Shell announced write-downs of \$17.5 billion and \$22 billion respectively, responding to internal company forecasts of continued lower near-term crude oil prices.

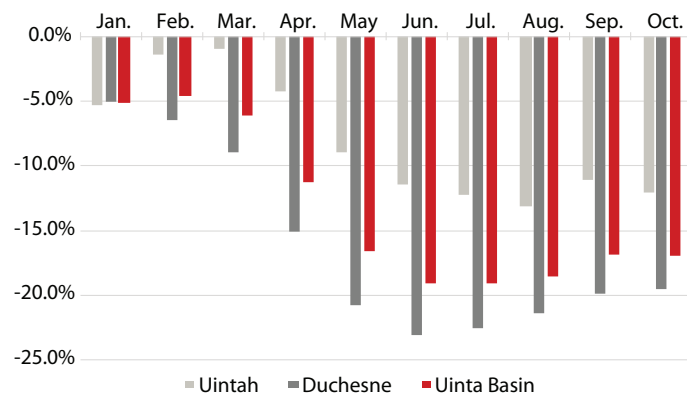
Figure 7: Highest Insured Unemployment Rates in Utah During COVID-19

(Weeks 12 through 19)



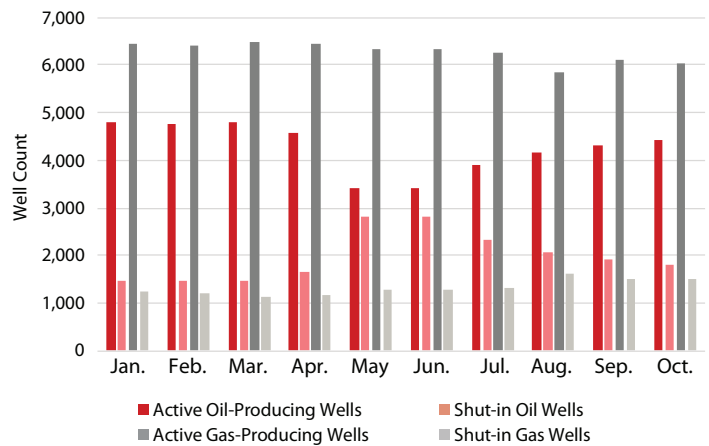
Source: Department of Workforce Services, Workforce Statistics—Unemployment Insurance Claims

Figure 8: Year-Over Change in Uinta Basin Cumulative Oil Production, 2020 vs. 2019



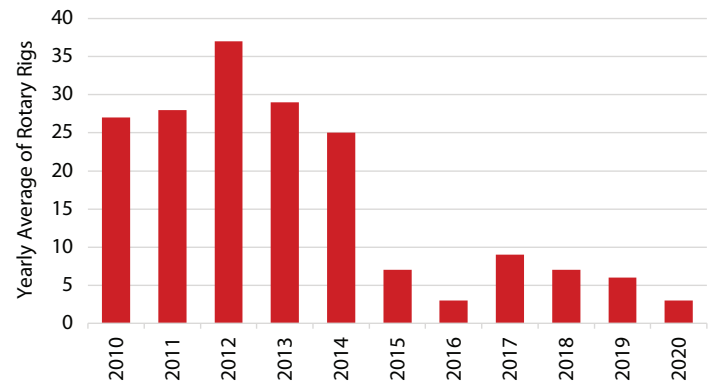
Source: Utah Division of Oil, Gas and Mining monthly production reports

Figure 9: Utah Oil and Gas Well Status in 2020



Source: Division of Oil, Gas, and Mining monthly production reports

Figure 10: Rotary Drilling Rig Count in Utah, 2010–2020



Source: Baker Hughes North America weekly rotary rig count by state

Uinta Basin operators have responded to lower crude oil prices by either decreasing or stopping production. By June 2020, year-to-date Uinta Basin oil production was down 19% from 2019; as of October it was still 17% lower (see Figure 8). Ovintiv, the operator of Monument Butte, temporarily shut-in field production. Monument Butte, a legacy field occupying over 110,000 acres, began production seven decades ago. While stopping production allows time for a potential bounce-back in crude oil prices to cover all operating costs, uncertainty exists that previous production levels will be achieved. Basin operators face the risk that shutting-in production may decrease future production levels when field operations resume. The number of shut-in oil wells nearly doubled from 1,462 in January to 2,828 in June, shrinking the number of active producing wells by 29% (see Figure 9). Since June, however, shut-ins have declined to 1,796 in October and active wells have increased to 4,416, still 8% below January's count.

Natural gas prices in the United States declined in 2020 due to lower demand from the electric power generation sector. Natural gas prices are projected to strengthen through year-end 2020 due to cold-weather seasonal demands and increased liquefied natural gas exports to European and Asian markets. Over the first 10 months of 2020, an additional 334 Utah natural

gas wells were shut-in due to COVID-19 supply and demand shocks, shrinking the number of active producing natural gas wells by 6%.

Another measure of oilfield activity is drilling rig count, indicative of exploration activities. Crude prices above \$70 per barrel from 2011 to 2014 spurred mobilization of more than 25 drilling rigs to Utah to explore for oil reserves. When robust production exceeded demand in early 2015, prices declined and rig activity slumped (see Figure 10). More recently, Utah's rig count fell from eight in the last week of March and first week of April 2020 to zero as of May 1st, reflecting expectations of energy demand and prices during the coronavirus pandemic. In the latter half of October there were three active rigs in the state.

Conclusion

COVID-19 caused reduced demand for motor and air transport, activities supplied directly by the energy industry. Global oversupply of crude oil concurrent with the COVID-19 pandemic sent crude oil prices to historic low levels. Utah's oil and gas industry experienced an unemployment spike as producers shut-in crude oil production in response to lower energy demand. Unknowns about secondary COVID waves prevent a clear line of sight to an outcome.

Endnote

1. Bank of Russia data listing international reserves of the Russian Federation. Saudi Arabian Monetary Authority data cited in Reuters News Service on 31 May 2020.

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