

Oil & Natural Gas Resources in Wyoming

January 2021
Summary Report

Wyoming State
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Other sources of oil & gas information:

[Wyoming State Geological Survey](#)

[Wyoming Oil and Gas Conservation Commission](#)

[Petroleum Association of Wyoming](#)

[EIA Short-Term Outlook](#)

[IEA Oil Market Report](#)

[IEA Natural Gas Report](#)

[OPEC](#)

Interpreting the past,
providing for the future



This time last year, oil and gas production in Wyoming were on a seemingly predictable path. Oil production was expected to again break records, and gas production was forecast to gradually decline, as it has since 2009. Within months, however, a perfect storm of dynamic national and international market conditions and a global pandemic drastically

changed the trajectory of Wyoming's production, especially of oil. Although the pandemic has dominated headlines, it is not the only factor contributing to Wyoming's tenuous oil and gas outlook—a challenge the state has faced before.

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Supply: Too Much of a Good Thing?

By early 2020, the United States claimed a significant share of the international oil market, and had even become a net petroleum exporter. Wyoming was on track to produce oil in quantities not seen since 1991. Crude oil production from the Powder River Basin consistently increased by more than 20 percent year-to-year from 2017 through 2019. However, economists and industry experts began warning of potential oversupply issues in both national and international markets. In an attempt to offset looming downward pressure on oil prices, OPEC+ agreed in late 2019 to cut production through March 2020, and as the pandemic escalated, they extended the cuts through July 2020. Yet new production continued to match or outpace withdrawals, and by April 2020, global crude oil storage was nearing capacity and U.S. inventories remained higher than average. In an attempt to regain market share, OPEC+ increased production by 2 million barrels per day in August 2020, and again in January 2021, by 0.5 million barrels per day, adding more oil to an already oversupplied global market. However, during their January 2021 meeting, Saudi Arabia announced surprise production cuts of one million barrels per day for February and March, improving the short-term supply outlook.

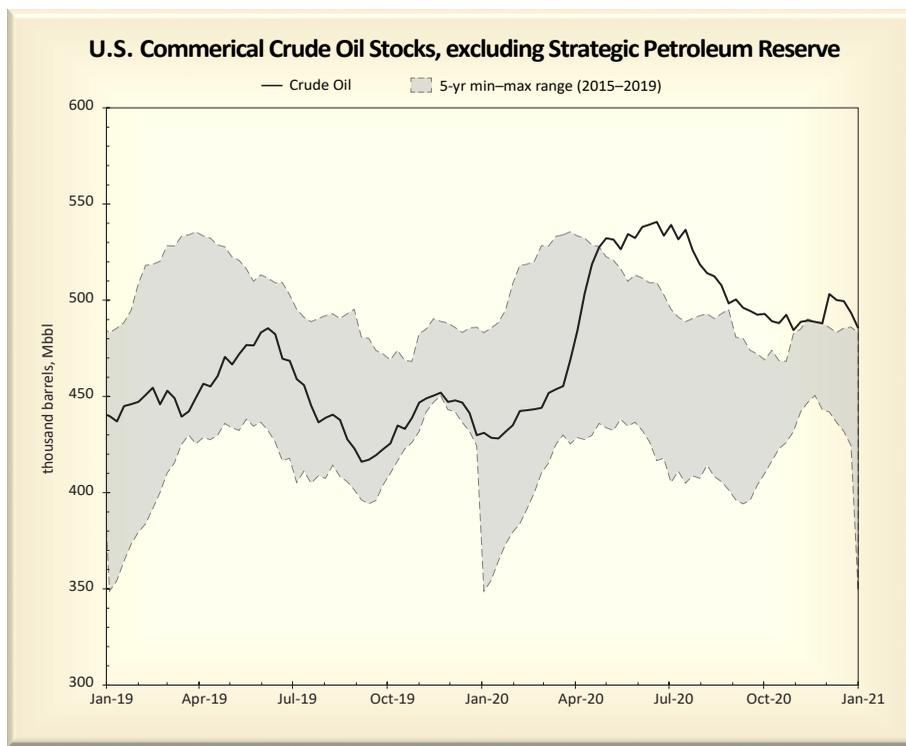
In contrast to oil, Wyoming's natural gas production has been in a gradual decline since the collapse of the coal bed natural gas industry in 2009. Despite Wyoming's advantages—some of the nation's largest natural gas reserves, two of the nation's 10 largest gas fields (Jonah and Pinedale), demonstrated success using horizontal drilling technology in these large fields, and abundant associated gas production from unconventional oil wells—a national supply glut continues to plague the state's natural gas industry. On the production side, this glut was caused by pipeline capacity expansions allowing record amounts of associated gas, shale gas, and liquid natural gas products to flood

U.S. markets. From June into November, natural gas inventories were well above the typical five-year range, and hovered at near record-breaking levels. Because long-term oversupply keeps prices low, Wyoming operators are limited in their ability to profit from gas production. As such, from 2010 to 2019, Wyoming's natural gas production declined an average of 4.4 percent each year, with a 13 percent decline in the first nine months of 2020. Although some of the 2020 decline is due to short-term reactions to the pandemic, the overall drop is a result of longer-term trends, including fewer new gas wells being drilled and the natural production decline of older wells.

Demand: Too Little of a Good Thing?

Another reason oil and gas markets remain oversupplied is that, even prior to the pandemic, consumer demand was not keeping pace with production and storage builds. At the beginning of 2020, fluctuating export opportunities, energy efficiency and fuel economy gains, cheaper renewable energy costs, and warmer-than-normal winter temperatures had already lessened demand for U.S. oil and gas.

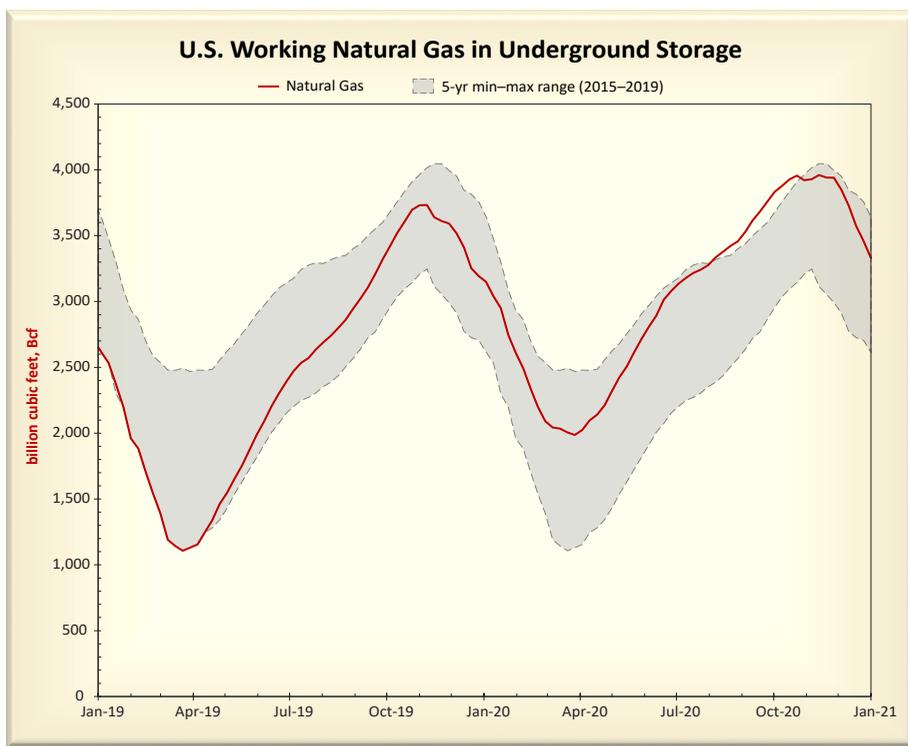
When the COVID-19 pandemic lockdowns abruptly slowed most of the economy, the combination of an already oversupplied market and severely diminished demand worsened the supply-demand imbalance and briefly forced April oil prices into the negative. Wyoming's crude oil prices, which typically track \$4–6 less than national benchmark WTI prices, averaged less than \$11 per barrel in April—a monthly average that had not been seen since the 1980s. The uncertain oil prices halted drilling of new oil wells in Wyoming, and many existing wells were temporarily taken off production, or shut in. As a result, the state's oil production this past May plummeted to less than 60 percent of the production from May 2019. Even the most optimistic predictions do not expect oil demand to return to pre-pandemic levels until mid to late 2021.



U.S. commercial crude oil stocks, 2019–2020. Source: [EIA](#)

Although both the warm start to 2020 and the pandemic's industrial sector slowdown temporarily decreased natural gas

demand and prices, natural gas was not as severely impacted by the pandemic as oil. Gas prices, both nationally and at Wyoming hubs, were somewhat insulated from the worst of the economic shock by increased residential electricity use as people stayed at home more. In fact, Wyoming gas prices began to climb in August, an increase attributed to rising electric power sector demand amid warmer-than-normal temperatures. As fall and winter weather has increased heating needs, Wyoming gas prices have continued to climb, breaking \$3 per thousand cubic feet at the end of October.



Working gas (gas available to the marketplace) in underground storage, 2019–2020. Source: [EIA](#)

Where are we Now?

Along with the rest of the world, Wyoming and its oil and gas industry are in a holding pattern. Although oil prices have recovered enough for some shut-in wells to be brought back online, prices have plateaued at levels below break-even for most Wyoming producers to drill new wells. As such, the state's rig count remains significantly lower than previous years. After dropping to zero earlier in 2020, four rigs were operating in

Wyoming at the end of December, compared to more than 30 a year ago. On a positive note, monthly oil production as of September 2020 rebounded to approximately 85 percent of pre-pandemic levels, likely due to the last of the horizontal wells drilled in early 2020 coming online combined with the return to production of some shut-in wells. However, unless crude oil prices increase and new wells are drilled to offset natural production declines in aging wells, this rebound may be temporary.

Gas production's long-term downward trend accelerated in 2020 due to diminished associated gas from unconventional oil wells. Although many new oil or gas wells are unlikely to be drilled at current prices, winter demand has started to draw down gas supplies, boosting natural gas prices over \$3 per thousand cubic feet. If natural gas price continues to increase, it may provide enough incentive for operators to begin drilling new gas wells in Wyoming. Any subsequent slowing or reversal of the state's long-term decrease in natural gas production will be subject to gas prices remaining elevated and storage remaining below capacity.

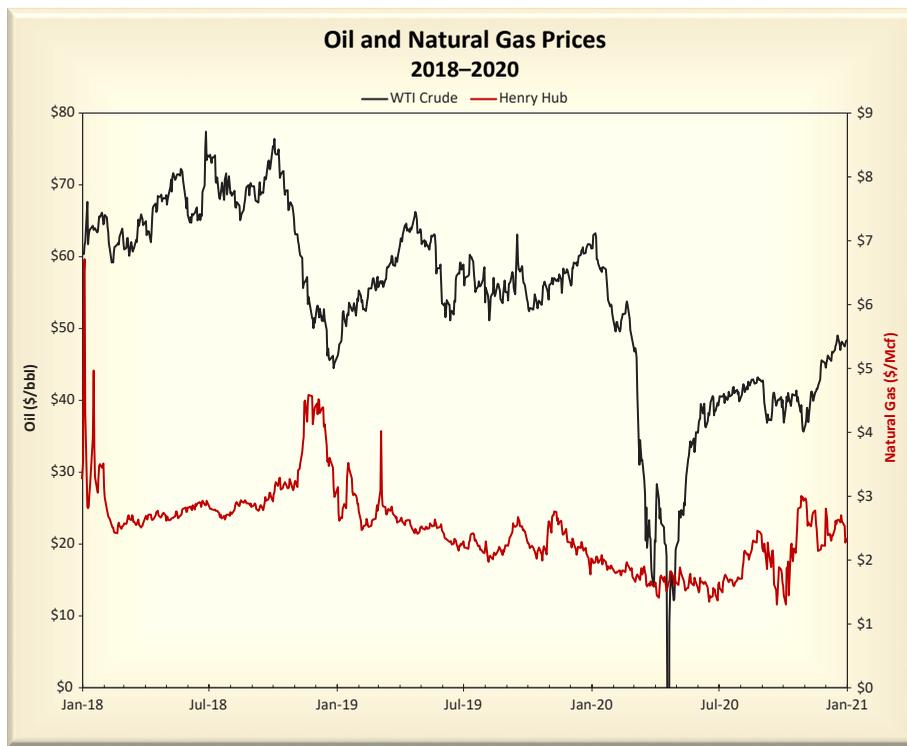
Where are we Going?

Wyoming has historically weathered its fair share of ups and downs inherent in energy development cycles. From 1884, when the first oil well was drilled in Dallas Dome, through the 1960s, Wyoming enjoyed an extended oil "boom." This consistent growth was due to the increasing prevalence of personal automobiles, improved understanding of petroleum systems, development of better exploration methods, extraction from deeper reservoirs, and wartime demand for petroleum products. The oil industry remained relatively constant through the 1970s. However, the 1980s saw a national and state recession, a global oil supply glut, and a hiatus in advancements in exploration and drilling technology, all of which ushered in one of the longest "bust" periods for the state's oil industry. Wyoming's oil production downturn was slightly slowed in the late 1980s by implementation of enhanced oil recovery methods such as water floods, but the state's next true oil "boom" did not start until 2009, when horizontal drilling and hydraulic fracturing techniques were successfully used to produce from unconventional tight reservoirs previously deemed uneconomic.

In contrast, natural gas production in Wyoming has had a much less volatile history. Exploration for and development of traditional gas fields provided the state with stable, consistent gas production for many decades. Wyoming's natural gas industry received a boost in the 1990s, when the large Jonah and Pinedale fields were rediscovered and operators figured out how to develop the tight gas reservoirs. In 2000, increasing gas prices and development of shallow coal bed natural gas reservoirs again steepened the slope of the state's gas production upward trend. The Wyoming coal bed natural gas "boom" lasted until 2009, when a national gas glut and economic recession caused prices to drop. Although associated gas from unconventional oil wells and infill drilling at the Jonah and Pinedale fields have offset some of the natural decline of traditional gas reservoirs, Wyoming has yet to see the start of another gas "boom."

While past recoveries from oil or gas "busts" typically involved new resource discoveries or technology advancements, the current situation has many diverse local, regional, national, and international factors at play. The timing of Wyoming's oil and gas industry recovery will depend on demand for oil and gas returning to levels that will draw down and balance supplies, future OPEC+ decisions, and prices returning to a value at which production from Wyoming reservoirs is profitable.

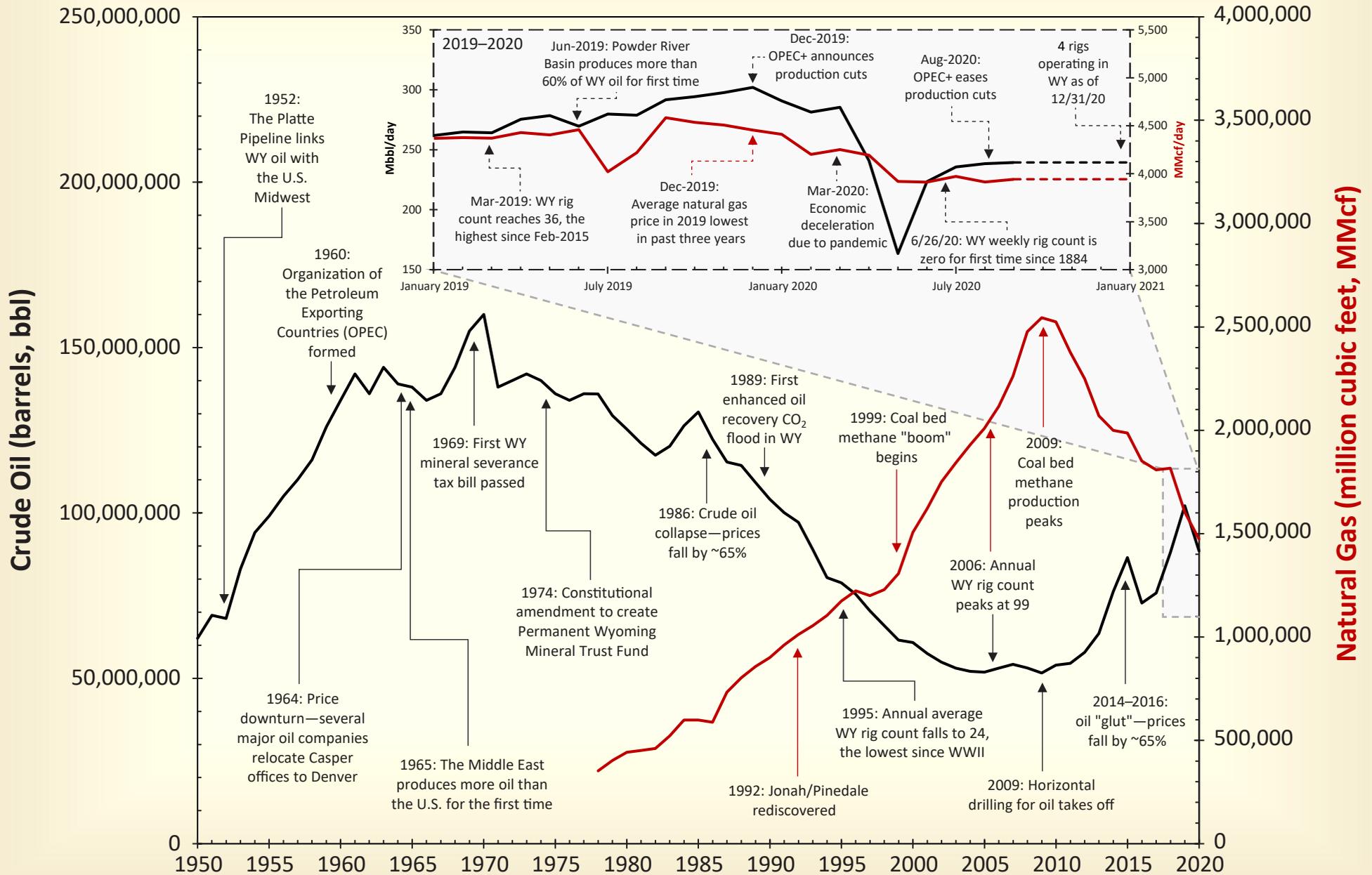
When supply, demand, and price factors again align, Wyoming's oil and gas industry is well positioned to rebound. Unconventional reservoirs in the Powder River and Denver basins contain substantial oil and associated gas reserves. In the Greater Green River Basin, horizontal drilling has greatly increased the production potential of Wyoming's large gas fields. Recent investment in pipeline infrastructure ensures the continued distribution of the state's resources. Overall, Wyoming is in a position to remain a major player on the national oil and gas stage for years to come.



Benchmark crude oil (black) and natural gas (red) prices, 2018–2020. Source: [EIA](#) (WTI) and [NGI](#) (Henry Hub)

Oil and Natural Gas Production in Wyoming, 1950–2020

— Crude Oil — Natural Gas



Timeline of Wyoming crude oil (black) and natural gas (red) production, 1950–2020. Source: WOGCC and historic WSGS data.

