

Subject: Review of [The Fiscal and Economic Impacts of Federal Onshore Oil and Gas Lease Moratorium and Drilling Ban Policies](#) by Dr. Timothy J. Considine, University of Wyoming

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The Considine study has a number of weaknesses that exaggerate the potential production and economic impacts of leasing moratorium by between an estimated 70-85%. While the report highlights the known need for federal lands climate policies to be designed in ways that help address fiscal and economic transitions, the report findings quickly unravel when we take a look at a number of highly flawed assumptions.

Impacts of a federal leasing pause are particularly small in the short term as companies may continue to extract from the large reserves of undeveloped lands and waters already under lease. Onshore, that includes 13.9 million acres that are leased and have not yet been drilled (53% of the total acreage leased onshore).ⁱ Modeling the extreme case of a permanent end to new federal leasingⁱⁱ, economist Brian Prest from Resources for the Future actually finds that during Biden's first term total US onshore oil and gas production may slightly rise due to higher prices.ⁱⁱⁱ

Author admits base methods may overestimate impacts by between 60 to 75%

Estimates of economywide benefits of oil and gas production for individual states are reported throughout the study using economic multipliers from the Bureau of Economic Analysis (BEA). When the author calculates the impacts with his own econometric analysis based on historical data, he finds that the economic impacts are 60 to 75% lower than when he uses the BEA multiplier-derived estimates. The BEA multipliers assume fixed prices and no substitution between factor inputs. That is simply not how markets work in reality. Bottom line, the use of BEA economic multipliers in the base methods is not justified and instead Considine should focus on the results he found when using the econometrically derived multipliers.

The modeling of a leasing pause doesn't add up

Considine says that the regression model used to simulate the effects of no new leases starting in 2021 finds a 62% drop in the number of wells drilled in the first year, an 81% drop by the end of year 2 (2022) and a 95% drop by year 5 (2026). This makes no sense. Considine's subsequent findings on well completions and on oil and gas production do not add up with typical lengths of time it takes for permit approvals, known lengths of federal lease terms, nor with average time between when a well is drilled and production begins to come online.

¹ The Wilderness Society provided financial support to conduct this review. I am grateful to Brian Prest from Resources for the Future for his related research insights and his annual modeling results from RFF Working paper 20-16 to evaluate differences in findings for the impacts of a hypothetical permanent leasing ban between Considine and RFF studies. I have no relevant or material financial interests related to the research described in this review. All of the judgments and conclusions of this review are entirely my own.

After obtaining a federal lease, operators submit an Application for a Permit to Drill (APD) on the lease to the Department of the Interior. For onshore federal leases, this process takes on average 212 days (or 7 months) to receive necessary approvals before drilling.^{iv} Assuming an operator then decides to start drilling immediately after securing the APD (not the actual case given the fact that there are over 7600 existing permits that are approved and not yet used), then the average time is 4 months between when well spud (drilling begins) and first production begins (aka completion/well comes online).^v That means at least 11 months pass between when a lease sale occurs and a well could possibly come online and start producing. This short time period would still require making an assumption that departs from the historic norm and assumes that operators start to pursue an application for a permit to drill immediately once they have secured a lease. According to a 2016 report by the Congressional Budget Office, operators do not typically begin development of onshore federal oil and gas leases until between year 8 to 10.^{vi} Very few federal leases are drilled in year 1 after obtaining a lease.

Considine's findings for impacts in the first 1-2 years are inconsistent with findings from at least 3 other models of US production impacts of a leasing pause. The US Energy Information Administration and non-partisan economists at the Federal Reserve and Resources for the Future estimate no reduction in US production from a leasing pause in the first year.

- 1) The US Energy Information Administration (EIA) included the effects of the leasing pause outlined in EO14008 in the Short-Term Energy Outlook (STEO) starting in March 2021.^{vii} EIA projects no effects on US production in 2021 and in 2022 expects no more than a 0.83% (0.1 million b/d) average reduction in US crude oil production.^{viii} EIA explains that “no effects [on US crude oil production] will likely occur until 2022 because there is roughly a minimum eight-to-ten month delay from leasing to production in onshore areas and longer in offshore areas.”^{ix}
- 2) Prest's modeling found that a permanent end to new federal leasing in 2021 would primarily affect production more than a decade into the future (after 2030).^x Prest finds that there would be no decline from baseline total US oil production until year 4 of a leasing moratorium and no decline from total US gas production until year 7. Prest's model predicts that a leasing moratorium, if anything, may increase total US oil production by as much as 2,000 barrels per day in 2021 and as much as 20,000 barrels per day in 2022 because of a slight rise in price.^{xi} For gas, Prest finds that a leasing moratorium, if anything, may increase total US gas production by as much as 12 million cubic feet per day (mcf/d) in 2021 and by as much as 184 mcf/d in 2022.
- 3) Even when looking at estimates from a model that assumes more rigorous permit reviews than currently in place in addition to a leasing pause, the Federal Reserve Bank of Dallas estimates that there will be no impact on production due to a leasing pause in year 1.^{xii} Focusing specifically on the Permian Basin, the Fed estimates that due to a leasing pause (in addition to more rigorous permit reviews than currently in place) could lead to a reduction in Permian oil production by an average of 18,000 barrels per day below baseline if a pause lasts 2 years.

Considine study fails to account for large production increases from state and private lands

The Considine study does not account for the likely dominating leakage impact of these policies that could increase oil and gas production from private and state lands (where state fiscal revenue will be higher^{xiii}) and instead focuses on what is likely to be rarer cases of production decreases on non-federal lands as a result of the “communitization requirement”. Prest’s 2021 working paper from Resources for the Future finds that around 25% of production reduced from onshore federal lands as a result of supply side policies are canceled out due to corresponding increases in oil and gas production on state and private lands. Production that will shift state or private lands will offset a portion of the lost investment and tax revenue from a decline in federal land production.

Prest actually finds that by the end of Biden’s first term total US onshore oil and gas production may rise by a cumulative 0.3%. This is because Prest finds that a leasing moratorium would increase the price of oil and gas in the long run by as much as 1.9-2.4%. Prest’s modeling suggests that by the end of Biden’s first term a leasing moratorium would result in 1.7% lower federal onshore gas production and 4% lower federal onshore oil production, but overall US onshore oil and gas production would rise by 0.3%. Although neither study models a temporary pause on leasing, conceptually a temporary pause would likely result in even smaller (if any) impacts.

Other top concerns with the Considine study include:

Huge uncertainty in Arctic Wildlife Refuge

33 to 45% of Considine’s findings of economic impacts after 2031 hinge on a supposed surge of development in the Alaskan region of the Arctic Wildlife Refuge, and yet there is fundamentally a lack of data to consistently model this production with any degree of certainty.

Drilling ban modeling is flawed

Separately, the Considine study incorrectly models how a potential drilling ban policy would work. The Considine study incorrectly assumes that all leases with drilling permits already in existence would also halt if a policy were announced to stop new drilling permits. This overestimates the impacts of what an actual policy would mean. Drilling permits are valid for two years and unused permits are frequently extended for another two years after that. This is why when modeling a hypothetical order to end drilling and to not extend existing permits once 2-year permit expires, as the Federal Reserve study points out, existing drilling permits would not expire until two years into the future.^{xiv}

Cost of emissions reductions are misleading

The report finds that the cost of emissions reductions range from \$58 to \$72 \$/ton when using the author's econometrically derived estimates and the author states that this cost is expensive relative to California's auction price of 16 \$/ton. This comparison is misleading and inappropriate for a number of reasons. First of all, the author is not transparent and fails to include his methodology or even the results of what he estimates for emission reductions that would stem from these policies. Second, we know these estimates would overestimate emissions reductions because the study incorrectly assumes a moratorium would nearly halt new production on existing leases within 5 years as well as ignoring likely leakage to nonfederal lands. Even if we assume that the author's emissions reduction estimates are accurate, the California auction price is not an appropriate comparison. The California program is not designed to yield cost-effective emissions reductions. California's auction prices are lower than the social cost of carbon because the state is able to reduce emissions cheaply.

A more appropriate comparison is the social cost of carbon (SCC). This cost, estimated at roughly 50 \$/ton for emissions^{xv}, approximates the \$/ton cost to society of the damages caused by each additional ton of carbon dioxide emitted to the atmosphere. Even the SCC is arguably a conservative comparison as it does not account for all societal damages from oil and gas production. Additional costs include climate damages from greenhouse gases that are more potent in the short-term such as methane that has an impact of at least 1,500 \$/ton^{xvi} as well as dangerous impacts to local health including from damages to air quality.

ⁱ U.S. Department of the Interior. 27 January 2021. <https://www.doi.gov/pressreleases/fact-sheet-president-biden-take-action-uphold-commitment-restore-balance-public-lands>

ⁱⁱ The leasing pause announced by the Biden Administration is not expected to last anywhere near that long, but at this time the length is unknown. Similar to what happened with the federal coal programmatic review, a leasing pause is expected to be temporary while reforms to the federal oil and gas program are assessed.

ⁱⁱⁱ Prest, B. *Supply-Side Reforms to Oil and Gas Production on Federal Lands: Modeling the Implications for Climate Emissions, Revenues, and Production Shifts*, Resources for the Future, Working paper 20-16. (Updated March 2021), available at: <https://www.rff.org/publications/working-papers/supply-side-reforms-oil-and-gas-production-federal-lands/> [hereinafter Prest 2021]. Calculations using supplemental annual results from Prest 2021 base price and elasticity scenario for baseline and for leasing moratorium scenarios.

^{iv} 7-month time to complete an APD on average between FY2011 and FY2020. Includes an average of 125.4 days waiting on operator and an average 86.6 days waiting on BLM. Source: BLM. Table 12 Time to Complete an Application for Permit to Drill (APD) Federal and Indian. Accessed on 17 April 2021. https://www.blm.gov/sites/blm.gov/files/docs/2021-03/Table12_TimetoCompleteAPD_2020.pdf

^v Prest 2021 p. 51 "Offshore wells tend to take longer to come online (nearly two years, compared to four months on average for onshore, although the offshore average is in part driven by the skewed distribution with the long right tail)."

^{vi} Congressional Budget Office. 2016. "Options for Increasing Federal Income from Crude Oil

and Natural Gas on Federal Land.”

^{vii} Energy Information Administration. Short Term Energy Outlook (STEO) March 2021. p.14-15.

<https://www.eia.gov/outlooks/steo/archives/mar21.pdf> EIA modeling assumes no new federal leases are issued as outlined in EO14008 but that issuing drilling permits continues pursuant to Section 3. Subsection G of DOI Secretarial Order 3395 <https://www.doi.gov/sites/doi.gov/files/elips/documents/so-3395-signed.pdf>

^{viii} Given total US forecast production for the March 2021 STEO was 12.0 million b/d in 2022, the expected change in production due to a pause would be no more than 0.83% in 2022 (0.1/12= 0.83%).

^{ix} Energy Information Administration. Short Term Energy Outlook (STEO) March 2021. p.14-15.

<https://www.eia.gov/outlooks/steo/archives/mar21.pdf>

^x Prest, B. *Supply-Side Reforms to Oil and Gas Production on Federal Lands: Modeling the Implications for Climate Emissions, Revenues, and Production Shifts*, Resources for the Future, Working paper 20-16. (Updated March 2021), available at: <https://www.rff.org/publications/working-papers/supply-side-reforms-oil-and-gas-production-federal-lands/> [hereinafter Prest 2021].

^{xi} Prest assumes no changes to drilling approvals on existing leases. For a permanent leasing moratorium Prest finds a long-term 1.9% rise in the price of both oil and gas when using base prices and future prices for WTI and Henry Hub as of summer 2020. In a high oil and gas price scenario, Prest finds a permanent leasing moratorium would lead to a 2.4% change in the price of oil and a 2.3% change in the price of gas in the long-term. A short-term impact on price would likely be less than that but still would likely result in a slight increase in overall US production for a temporary leasing pause.

^{xii} Golding G. Kunal P. (4 March 2021). *Anticipated Federal Restrictions Would Slow Permian Basin Production*. Federal Reserve Bank of Dallas. March 2021. <https://www.dallasfed.org/research/economics/2021/0304> These results are from the hybrid case. The authors assumed there would be no new federal leasing, and that existing leaseholders continue receiving drilling permits. However, they assume that permit reviews are more rigorous than they have been in the past and therefore this leads to “slower approvals and a costlier operating environment beginning in 2022”.

^{xiii} <https://westernpriorities.org/wp-content/uploads/2015/07/Royalties-Public-Revenues-from-Energy-Development-on-American-Lands.pdf>

^{xiv} Golding and Kunal 2021

^{xv} Estimate is in 2019 dollars and is based on a 3% discount rate.

^{xvi} Marten et al. 2015. *Climate Policy*. Vo. 15, Issue 2 p. 272-298.

<https://www.tandfonline.com/doi/full/10.1080/14693062.2014.912981>

This value reflects Marten et al. (2015)'s estimate of the social cost of emitting an additional metric ton of methane today using 2020 dollars and a 3% discount rate. This uses the Marten et al. (2015) approach because it directly estimates the social cost of methane and follows methods used to approximate the official United States Government estimate of the social cost of carbon. The Marten et al. (2015) value is likely an underestimate; it does not include comprehensive impacts on human welfare or the higher radiative forcing from methane as estimated in the IPCC's Fifth Assessment Report (AR5).