Hearing on
Contributions of the oil and gas sector to jobs and the economy, and the role the federal government plays in those contributions

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Chair Porter, Ranking Member Gosar, and distinguished members of the Subcommittee:

Thank you for the opportunity to appear before you today.

My name is Laura Zachary, and I am Managing Director of Apogee Economics and Policy, a consulting firm based out of Palo Alto, CA and Washington, DC. Apogee EP provides in-depth economic and policy analysis on issues related to energy, climate, and the environment. As an independent consultant for The Wilderness Society, I have worked on numerous research projects for the past five years involving fossil fuels produced on federal lands and waters. Since 2016 Apogee EP has created and maintained a model projecting oil, gas, and coal development on US federal lands and waters.[1] Since 2015, I have also worked on a number of projects as an independent consultant with economists at Resources for the Future (RFF), an independent, nonpartisan, nonprofit research institution in Washington, DC. RFF's mission is to improve environmental, energy, and natural resource decisions through impartial economic research and policy engagement. The views expressed here are entirely my own.

I was invited to testify today about my investigations comparing findings across studies that model a federal leasing moratorium and in particular to share my review of an often-cited report by Dr. Timothy Considine, hereafter Considine 2020.[2] I have reviewed the findings of all studies that I am aware of that model the production impacts of a federal oil and gas leasing pause or a permanent leasing moratorium. Results from a working paper by Dr. Brian Prest, an economist and fellow at Resources for the Future, most explicitly models the annual US-wide production impacts of a permanent federal leasing moratorium over the long-run and provides annual breakdowns by onshore and offshore that enables comparisons to findings of other models.[3]

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[1] Ratledge N, Davis SJ, Zachary L. 2019. Public lands fly under climate radar. Nature Climate Change, 9:89-93.
[2] Considine TJ, 2020. The Fiscal and Economic Impacts of Federal Onshore Oil and Gas Lease Moratorium and Drilling Ban Policies. Released by Wyoming Energy Authority in December 2020. https://www.wyoenergy.org/wp-content/uploads/2020/12/Final-Report-Federal-Leasing-Drilling-Ban-Policies-121420.pdf [hereinafter Considine 2020].
[3] Supplemental annual results from 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). https://www.rff.org/publications/working-papers/supply-side-reforms-oil-and-gas-production-federal-lands/ [hereinafter Prest 2021].

For my testimony today I begin with a brief overview of the current federal oil and gas leasing pause. Second, I review findings across four models that make relevant projections about the near-term production impacts of a leasing pause. Third, I review several methodological concerns about the Considine 2020 report and implications for relying on its findings to draw conclusions about likely impacts of a temporary leasing pause or for a longer term leasing moratorium.

Federal Oil and Gas Leasing Pause

Federal agencies and fiscal policy experts have long called for fiscal reforms to the federal oil and gas program.[4] Compared to how states manage oil and gas leasing, the federal government foregoes at least a third of the revenue that could be captured for taxpayers.[5] On January 27, 2021, President Biden signed Section 208 of Executive Order (E.O.) 14008, which pauses issuing new federal oil and gas leases until a comprehensive review is complete. E.O. 14008 directs the Secretary of the Interior to "pause new oil and natural gas leases on public lands or in offshore waters pending completion of a comprehensive review and reconsideration of Federal oil and gas permitting and leasing practices in light of the Secretary of the Interior's broad stewardship responsibilities over the public lands and in offshore waters…".[6]

E.O. 14008 does not pause issuing drilling permits on the 13.9 million acres of existing leases that have yet to be drilled across onshore federal public lands.[7] The same holds for offshore; E.O. 14008 does not impact drilling permits from being issued on the existing 9.3 million acres already leased offshore in federal waters that have yet to be drilled.[8] Federal permitting data confirms that there is no drilling moratorium. During the first two full months under the Biden administration, the US Department of the Interior (DOI) approved 687 applications for permits to drill across onshore federal lands and offshore federal waters. Between February 1st and March 31, 2021, the Bureau of Land Management (BLM) approved 561 permits across nearly all state offices and the Bureau of Safety and Environmental Enforcement (BSEE) approved 126 permits for offshore oil and gas drilling in the Gulf of Mexico.[9] These permitting approval rates appear in-line with past administrations. Looking at the first three full months of the

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[4] *See report by Dan Bucks, former Director of the Montana Department of Revenue and former Executive Director of the Multistate Tax Commission, for a detailed history of fiscal mismanagement and calls for fiscal reforms to the federal oil and gas program,* Bucks D. May 2020. Fiscal Responsibility in the Management of Oil and Gas Leases on Federal Lands. https://bit.ly/3h3hBWX

[5] Bucks 2020. p.1, p.24

[6] Executive Office of the President. Executive Order (E.O.) 14008 of Jan 27, 2021. Tackling the Climate Crisis at Home and Abroad. 86 FR 7619. https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad

[7] US Department of the Interior (DOI). 27 Jan 2021. Fact Sheet: President Biden to Take Action to Uphold Commitment to Restore Balance on Public Lands and Waters, Invest in Clean Energy Future. Updated 11 Feb 2021. https://www.doi.gov/pressreleases/fact-sheet-president-biden-take-action-uphold-commitment-restore-balance-public-lands

[8] *Id.*

[9] US Bureau of Land Management (BLM). 2021. Applications for Permits to Drill. Last accessed 23 April 2021. https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/operations-and-production/permitting/applications-permits-drill; US Bureau of Safety and Environmental Enforcement (BSEE). 2021. Status of Gulf of Mexico Well Permits. Last accessed 14 May 2021. https://www.bsee.gov/stats-facts/offshore-information/status-of-gulf-of-mexico-well-permits;

Biden administration's term in office, DOI approved 25 more permits for offshore activities in the Gulf of Mexico than it did during the first three months of the Trump administration.[10]

Modeling Consensus Finds No Negative Impact to US Production in Year 1 of a Leasing Pause and Negligible Production Impacts in Years 2 thru 4

I focus the next section of my review on what research and modeling indicates will be the likely impacts on US production due to the federal government not issuing new oil and gas leases for one year (end of 2021), the impacts of a pause that lasts two years (end of 2022), and the impacts of a pause that lasts until the end of the Biden administration's first term (end of 2024). In order to enable better comparisons across modeling results, I refer to findings of a leasing pause compared to the baseline (business-as-usual) scenario by length of time since the pause began (e.g. year 1, 2, or 4).

Table 1. Comparing Modeling Results of US Production Impacts of a Federal Leasing Moratorium that Lasts 1, 2, or 4 Years

		Total US (onshore, offshore, federal, non-fed)		**US Onshore** (federal and non-federal)		**US Offshore** (federal and non-federal)	
		Prest 2021	EIA STEO 2021	Fed 2021-Permian*	Prest 2021	Prest 2021-all US offshore	EIAP 2020-Gulf of Mexico
findings for % change in production in Year 1	Oil	0.02% increase	0.91% increase	0.00%	0.02% increase	0.00%	0%
	Gas	0.01% increase	N/A	N/A	0.01% increase	0.00%	0%
findings for cumulative % change in production by end of Year 2	Oil	0.12% increase	-0.83%	-0.39%	0.17% increase	-0.12%	0%
	Gas	0.11% increase	N/A	N/A	0.11% increase	-0.09%	0%
findings for cumulative % change in production by end of Year 4	Oil	0.04% increase	N/A	-1.79%*	0.26% increase	-1.04%	-0.18%
	Gas	0.25% increase	N/A	N/A	0.29% increase	-0.82%	-0.28%

*Note, the Federal Reserve study also assumes increased hypothetical restrictions on drilling permits beginning in 2022.

Economist Brian Prest, a fellow at the non-partisan economic think tank Resources for the Future (RFF), found that a permanent end to new federal leasing would primarily affect production more than a decade into the future (after 2030).[11] 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

[10] Id. February, March, and April 2021 permits across all water depths came to 205 for Biden's DOI first two full months in office compared to 180 for February, March, and April 2017 for the first three full months of the Trump Administration. The monthly historic breakdowns are not as easily available to make similar comparisons across the administrations for BLM onshore permitting.
[11] Prest 2021

US gas production until year 7.[12] 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 year 1 (a 0.02% increase) and as much as 20,000 barrels per day in year 2 (a 0.12% increase) because of a slight rise in price.[13] 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 in year 1 (a 0.01% increase) and by as much as 184 million cubic feet per day in year 2 (a 0.11% increase).

The US Energy Information Administration (EIA) included the effects of the leasing pause outlined in E.O. 14008 in the Short Term Energy Outlook (STEO) starting in March 2021.[14] Similar to the RFF modeling results, 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.[15] 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."[16]

Even when looking at estimates from a model that assumes more rigorous permit reviews than currently in place, the Federal Reserve Bank of Dallas estimates no impact on production due to a leasing pause in year 1.[17] Focusing specifically on the Permian Basin, the Fed estimates that a leasing pause combined with more rigorous permit reviews could lead to a -0.39% cumulative reduction in Permian oil production below baseline if a pause lasts 2 years and a decline of -1.79% below baseline if a leasing pause (plus hypothetical additional permitting restrictions than currently in place) lasts for 4 years.[18]

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[12] 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 June 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.

[13] Prest 2021

[14] 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

[15] 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 ((12-11.9)/12= 0.83%). STEO p.15: EIA expects U.S. crude oil production to average 11.1 million barrels per day (b/d) in 2021, 0.1 million b/d more than in the February STEO (a 0.91% increase due to higher prices). In general, the increase in EIA's U.S. crude oil production forecast reflects higher expected crude oil prices between when the February and March 2021 STEOs were completed. Forecast production rises to 12.0 million b/d in 2022, which is up 0.5 million b/d from the February STEO (a 4.35% increase).

[16] EIA STEO March 2021 p.14-15.

[17] 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." They assume an average price of $50 for benchmark WTI.; *See* 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

[18] 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 Assumes an average price of $50 for benchmark WTI.

Looking specifically at offshore production impacts, Energy & Industrial Advisory Partners (EIAP) projects no impacts to offshore production in the Gulf of Mexico due to a leasing moratorium in year 1 or year 2.[19] These results are similar to Prest 2021 findings for production impacts to offshore oil due to a leasing moratorium. Prest 2021 finds practically zero (0.00024%) reduction in total US offshore oil production in year 1, and practically no (0.12%) reduction in total cumulative US offshore oil production by the end of year 2 of a federal leasing moratorium. Comparing available annual modeling for offshore gas production impacts due to a federal leasing moratorium, EIAP 2020 and Prest 2021 projections are almost identical. EIAP again projects that there will be no impacts in year 1 or year 2 on offshore gas production in the Gulf of Mexico. Prest 2021 finds practically zero (+0.0018%) increase in total US offshore natural gas production in year 1 and practically zero (-0.09%) reduction in total cumulative US offshore gas production by the end of year 2 of a federal leasing moratorium.

If the leasing moratorium lasts 4 years, then EIAP estimates a cumulative -0.183% reduction in offshore oil production in the Gulf of Mexico by the end of year 4 and Prest finds -1.04% cumulative reduction below baseline in all US offshore oil production by the end of year 4. For offshore gas, EIAP estimates a cumulative -0.28% reduction in gas production by the end of year 4 and Prest 2021 finds -0.82% cumulative offshore gas production by end of year 4.

Concerns about Considine 2020 Assumptions and Methods

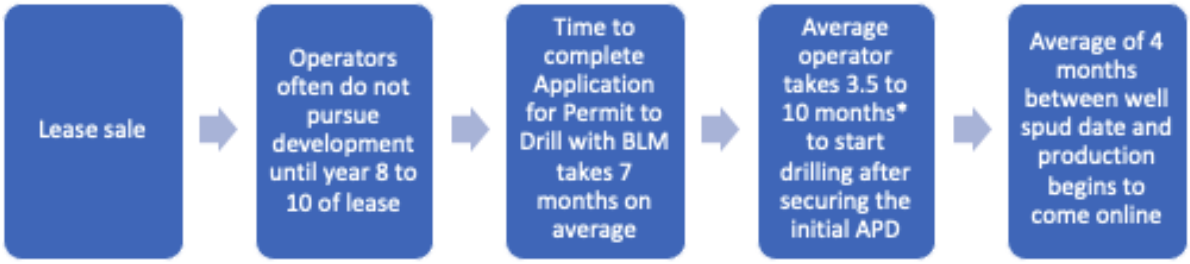
The Considine 2020 report finds that a moratorium on new leases starting in 2021 results in a 62% drop in drilling (wells spud) in the first year, an 81% drop by end of year 2 (2022), and a 93% drop by year 4 (2024).[20] Considine 2020 findings on near-term development impacts of a leasing moratorium differ from the modeling consensus at least in part because underlying assumptions do not correspond with the 14.5 month minimum time that passes between when a lease is issued and an average well could start producing for onshore federal leases.

After obtaining a federal lease either through a competitive or noncompetitive sale, operators submit an Application for a Permit to Drill (APD) on the lease. On average, BLM takes 212 days (or 7 months) to approve an APD.[21] Surveying New Mexico data on new federal wells that both received an APD and were spud since 2018, an average of 3.5 months passed between when the operator received the APD approval and when it began to drill (spud date).[22] (This average likely underestimates the average length of time between APD approval and commencement of drilling for federal wells in New Mexico because it does not include the 25% of

[19] Energy & Industrial Advisory Partners (EIAP). 2020. "The Economic Impacts of the Gulf of Mexico Oil and Natural Gas Industry." Prepared for NOIA.
[20] Considine 2020 Figure 7.
[21] 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
[22] State of New Mexico. Oil Conservation Division. Federal APDs New Wells Data. Updated 3 Feb 2021. http://www.emnrd.state.nm.us/OCD/documents/ExpandedWellsFedNewWells20200203.xlsx

already-approved APDs where operators had yet to start drilling).[23] Once a well is spud (drilling begins), an average of 4 months pass before first production begins.[24] That means, in total, at least 14.5 months pass between when a lease is issued and an average well could possibly come online and start producing.

Figure 1. Typical lengths for stages of average onshore federal oil and gas leases means at least 14.5 months pass between when a lease is issued and an average onshore federal well could possibly start producing.



In practice, operators historically have taken much longer than 14.5 months to begin producing after acquiring a lease. Onshore federal oil and gas leases have an initial 10-year term and operators often do not begin development until between year 8 to 10.[25] Once production begins on a lease, operators can extend that lease indefinitely. To validate the finding that a leasing pause results in a 95% reduction in well spuds by year 5, Considine 2020 asserts that this finding is "consistent with the five-year average term for most oil and gas leases."[26] This 5-year assumption is inconsistent with the fact that onshore federal leases have an initial ten-year term. In fact, as shown in *Figure 2*, Congressional Budget Office (CBO) analysis finds that the bulk of production on federal leases occurs more than 10 years after the lease sale.[27] Furthermore, there are over 7,800 existing onshore drilling permits that are approved and not yet used onshore and DOI continues to issue new permits.[28] Approved drilling permits are valid for two years and

[23] If including the length of time that has passed to date for the more than a quarter of new federal oil and gas wells in New Mexico that have received an APD and have yet to drill, the average time that has lapsed between APDs and spud wells or APD received and now for those that have yet to begin drilling grows to 10 months. This also excludes all wells that have "1/1800" as value for Last Produced.

[24] 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)."

[25] Congressional Budget Office (CBO). 2016. "Options for Increasing Federal Income from Crude Oil and Natural Gas on Federal Land." https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51421-oil_and_gas_options.pdf Onshore oil and gas legislation is codified at 30 U.S.C. §226, and the corresponding regulations are at 43 C.F.R. Parts 3100–3120.

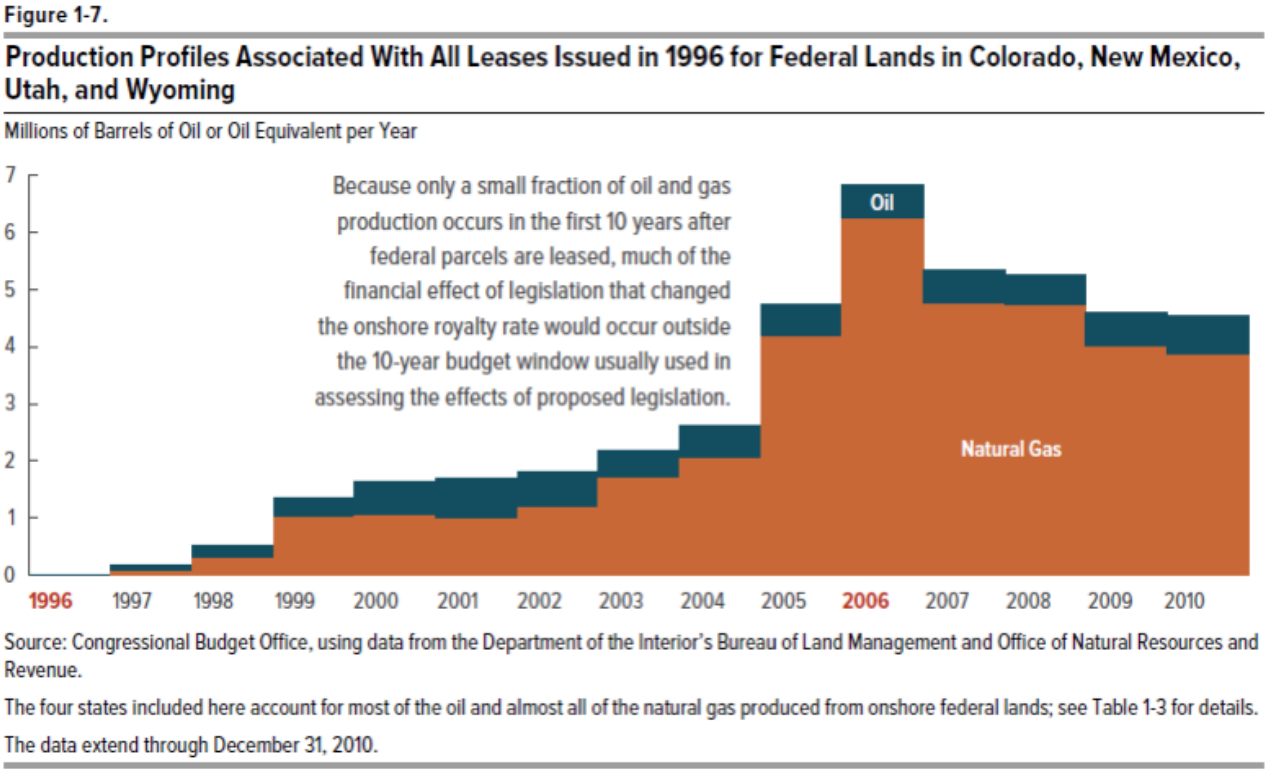
[26] Considine 2020. p.11

[27] CBO 2016. Figure 1-7

[28] US Bureau of Land Management (BLM). 2021. Applications for Permits to Drill. Last accessed 23 April 2021. https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/operations-and-production/permitting/applications-permits-drill;

unused permits are frequently extended for another two years after that.[29] The rapid declines in drilling reported by Considine 2020 do not line up with these parameters.

Figure 2. Most production on federal leases occurs more than 10 years after the lease sale[30]



Methods appear incapable of predicting drilling when no new leases are issued

The regression analysis performed in Considine 2020 to simulate the development impacts of a leasing moratorium is problematic for a number of reasons.[31] Considine 2020 is vague about what datasets are used and how the simulation was performed.[32] While the methodology is unclear, if a reader takes the Considine 2020 summary of regression results literally (Table 6 of Considine 2020), then the model is incapable of predicting federal spuds when zero federal

[29] BLM. 2007. "The Gold Book." Chapter 3, p. 8 https://www.blm.gov/sites/blm.gov/files/Chapter%203%20-%20Permitting%20and%20Approval%20of%20Lease%20Operations.pdf

[30] CBO 2016. Figure 1-7

[31] See Considine 2020 regression shown on p.10, "Table 6: Parameter estimates for federal lease effects" and annual results on p.11 "Figure 7: Simulated reduction in well spuds after a lease moratorium"

[32] On p.10 Considine 2020 states "this study uses data from the US Department of Interior on all new federal leases and well spuds, including oil and gas wells combined." Neither of the two data sets listed in the study's references that come from offices within DOI include data on new federal leases and well spuds from new federal leases. DOI data included in Considine 2020 references are limited to ONRR revenue data and BLM Average APD Approval Timeframes for FY2005-FY2012.

leases are issued.[33] Considine 2020 appears to be doing something else to simulate the effects of no new federal leasing, but it is not clear what.

Considine 2020 fails to account for shifts in production to state and private lands

The Considine study does not account for the potential spillover impact of these policies that could increase oil and gas production from private and state lands (where state fiscal revenue will be higher) 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".[34] Prest 2021 estimates that around 25% of production reduced from onshore federal lands as a result of supply side policies would be offset by corresponding increases in oil and gas production on US state and private lands.[35] That shift to state or private lands will further reduce lost investment and tax revenue from any minimal decline in federal production in the near-term due to a temporary leasing pause.[36]

Estimated Impacts to Oil and Gas Tax Revenues, GDP, and Jobs

Much of revenue from oil and gas taxes are pegged to production. For example, most of the onshore program's revenue (87%) comes from royalties on producing leases.[37] A CBO analysis found that less than 6% of annual revenue from the onshore oil and gas program comes from parcels that were leased in the previous decade.[38] As a result, overestimates of drilling and production impacts from a leasing moratorium drive the Considine 2020 findings on near-term impacts on expected oil and gas tax revenue.

It is also important to consider opportunity costs of not pausing to adjust fiscal terms of the federal oil and gas program. In fact, by postponing those sales and not entering into new lease agreements until after the Programmatic Review is complete, states are likely to earn more revenue than if those leases were sold today because of potential fiscal reforms that will result from the Programmatic Review. Research by Dr. Brian Prest that models the effects of three supply-side policy options to reform the federal oil and gas program finds that by raising the onshore federal royalty rate to 18.75%, federal royalty revenue would increase by an average of $1 to $2.1 billion per year out to 2050 (around half of which would go to the states where

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[33] See Considine 2020 Table 6. Parameter estimates for federal lease effects. Considine's regression uses log (lagged new leases), which is undefined for new leases = 0. Setting federal leases close to zero would lead to a ~100% reduction in drilling for any positive coefficient on leases. Considine's regression of the coefficient on log(lagged spuds) has a coefficient of 0.754981-0.7608. If we assume that the starting value of leases is above the long run mean implied by the model, then, holding all else constant including leases, the model predicts a 25% drop in log (drilling) every year (1-0.75=0.25).

[34] US Government Accountability Office. 24 Sept. 2019. Table 1. Federal and State Lease Terms and Practices for Onshore Oil and Gas Leases, as of September 2019. From GAO-19-718T. https://www.gao.gov/products/gao-19-718t

[35] Prest. 2021.

[36] Golding G and Patel K. 2021. "Anticipated Federal Restrictions Would Slow Permian Basin Production." Federal Reserve Bank of Dallas (Mar. 4, 2021), https://bit.ly/3lx25Tk. Golding and Patel also note that over time as a result of restrictions that apply only to federal lands, production and employment will gradually shift from federal lands in New Mexico to private and state lands in both New Mexico and Texas

[37] Id. (87% nationwide between 2010-2019 ONRR March 2021 calendar year revenue data)

[38] CBO 2016. Figure 1-8. Shares of Royalty Receipts Collected in 2013 From Onshore Parcels, by Decade of Original Lease. CBO analysis using data from ONRR

production occurred).[39] Raising the onshore and offshore federal royalty rate to 25%, would increase revenue by an average of $2.6 to $5.3 billion per year out to 2050.[40] Instituting a pollution fee (or what Prest refers to as a carbon adder) based on the social cost of emissions that is pegged to federal production would raise between an estimated $2.8 and $7.7 billion per year out to 2050.[41]

Finally, in addition to Considine 2020 assumptions that overestimate drilling and production impacts in the near-term, the study further overestimates the economic impacts on GDP, employment, and income due to a leasing moratorium by using multipliers that estimate impacts 60 to 75% higher than when using multipliers based on historical data.[42] Instead of using the historic-based multipliers to estimate economic impacts, Considine 2020 uses multipliers that fail to account for how markets work in reality by assuming fixed prices and no substitution between factor inputs.

Conclusion

Considine 2020 does not clearly support the different findings that drilling will drop by 62% in year one, 81% in year two, and 93% in year 4 of a leasing moratorium. Nor does the study reconcile these projections with factors such as APD processing timelines, findings that the majority of production from federal leases occurs 10 or more years after a lease is issued, the more than 7800 existing drilling permits, and the fact that drilling permits continue to be issued on the millions of existing acres already under lease. Because those assumptions drive the findings on production impacts and subsequent fiscal and economic impacts, the findings do not enable reliable conclusions about the projected impacts of a leasing moratorium in the near-term. In addition, Considine 2020 uses multipliers that estimate between 60 and 75% higher economic and employment impacts compared to other methods and one should use caution when citing these findings on jobs and GDP for both near- or long-term projections.

[39] Prest 2021 total annual projections for onshore federal royalty revenue gains due to increasing onshore royalty rates to 18.75% from analysis completed by Prest 2021 (Supplementary annual data RFF WP 20-16 updated in March 2021) Note that this estimate is specific to changes only in the federal royalty rate revenues (not in bonus bids, rents, and other federal oil and gas revenues). However, since royalties are the majority (87%) of the federal onshore revenues, the estimate gives a good sense for the overall fiscal impacts.

[40] Prest 2021. Table 1 and Table A.9

[41] Prest 2021. Table 1 and Table A.9

[42] Considine 2020 p.46