Statement before the House of Representatives Committee on Natural Resources
Subcommittee on Oversight and Investigations

"Unleashing the Golden Age of American Energy Dominance"

Testimony by:

Glen E. Sweetnam

Distinguished Fellow
Energy Policy Research Foundation, Inc.

Senior Vice President
Asia Pacific Energy Research Centre

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Energy Policy Research Foundation, Inc.
25 Massachusetts Ave, NW, Suite 500P
Washington, DC 20001

www.eprinc.org
Tel: (202) 944-3339
Fax: (202) 364-5316

Chairman Gosar, Vice-Chairman Boebert, and members of the subcommittee, I want to thank you for inviting me to testify at this hearing on *Unleashing the Golden Age of American Energy Dominance*.
I am currently a distinguished fellow with the Energy Policy Research Foundation, Inc. (EPRINC), a nonprofit Public Policy Research organization. I have worked closely with EPRINC staff on several projects. A noteworthy project is EPRINC's 2023 highly regarded report, *A Critical Assessment of the IEA's Net Zero Scenario, ESG, and the Cessation of Investment in New Oil and Gas Fields* in which I contributed the modeling design. I also think the Committee should be aware of EPRINC's *Power Vision 2030* project which documents the severe challenges our electric power sector faces in meeting surging demand. It is now becoming clear that we will not have sufficient generation capacity to meet accelerating power demands unless we make some fundamental policy reforms that permit us to build and operate more dispatchable power. I am submitting both reports to the Committee as part of my testimony.

Today I will discuss EPRINC's recent estimates of additional domestic oil and gas production from expanded leasing on public lands, including Alaska, lower-48 onshore, and the Outer Continental Shelf (OCS). These estimates were developed through analysis and calculations undertaken by Max Pyziur and Matthew Sawoski. Batt Odgerel was instrumental in supporting my calculations on the economic growth potential from enhanced oil and gas production and distribution. All three of these individuals are full-time staff at EPRINC.

I am also the Senior Vice President of the Asia Pacific Energy Research Centre, in Tokyo, Japan. In this position, I lead a group of researchers from 17 of the Asia Pacific Economic Cooperation (APEC) member economies. The group produces an annual overview of energy policies and energy data for each of the 21 APEC members. Every three years, APERC also publishes the *APEC Energy Demand and Supply Outlook*. I am also Chair of APEC's Expert Group on Energy Data and Analysis (EGEDA).

Previously, I served in senior positions at the U.S. National Security Council, the U.S. Department of Energy, and the Energy Information Administration. My primary focus was the modeling and analysis of domestic and international energy markets, especially as they relate to government preparations for and responses to energy supply disruptions. In addition to my government service, I have held senior planning, evaluation, and risk management positions at several energy companies, including Reliant Energy, Koch Industries, ARCO, and Fina Oil and Chemical Company.

Introduction
The oil and gas industry of the United States is an instrument of national power and wealth creation that can deliver affordable, reliable, and secure energy to lift our national economy. Today the United States is the world's largest oil and gas producer, but perhaps more importantly, has the most sophisticated and competitive oil and gas companies in the world. If unshackled from inefficient and unnecessary constraints and regulations, which limit oil and gas production from our vast domestic resource base, we can bring forward a new age of American energy dominance.

The North American oil and gas production platform can operate at a high level of efficiency and solve a wide range of complex technical and cost challenges starting with the exploration and production of oil and gas, its distribution to processing facilities and export markets, and the production of transportation fuels to American consumers and a wide range of essential products, including fertilizers, pharmaceuticals, and plastics. Both natural gas and refined products routinely move through cross-border pipelines in Canada and Mexico and waterborne supplies move in and out of U.S. ports. The efficient operation of this production platform has placed the United States in a unique position, not only to deliver affordable energy to U.S. consumers but also to lift national income and provide a secure energy lifeline to our allies.

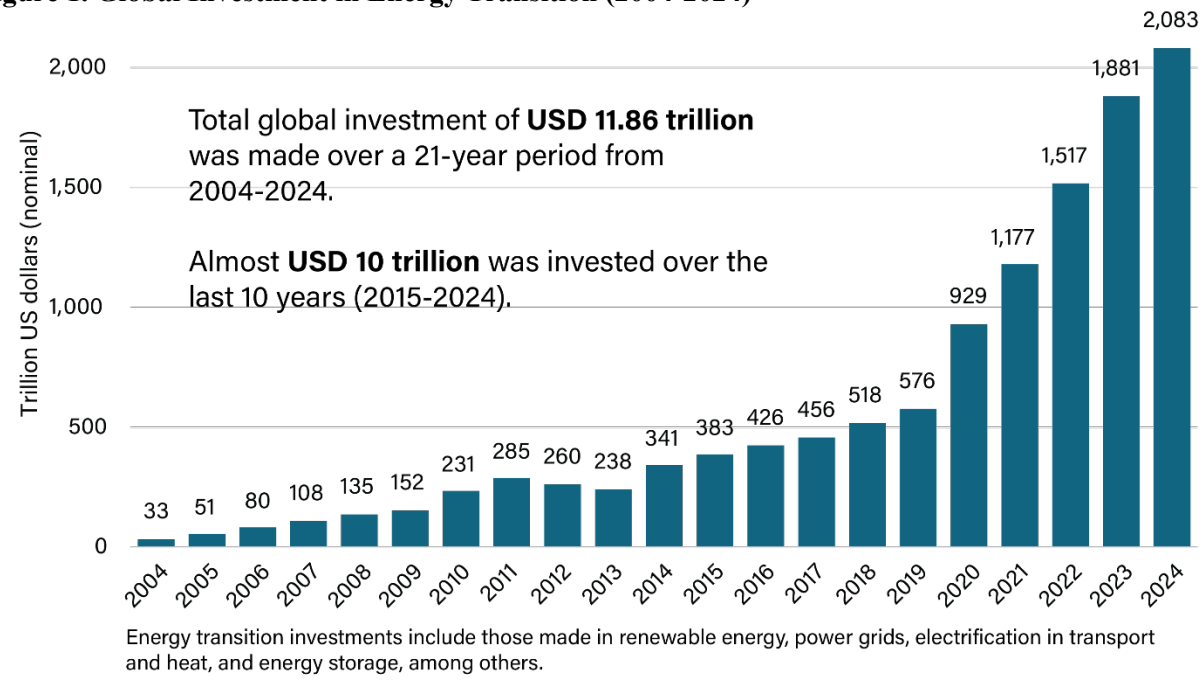
Today my testimony will outline the potential yield in enhanced energy security, affordability and economic growth if additional prospective acreage is made available and this opportunity is accompanied by predictable and common sense regulation. Excessive limits on new acreage for development, delays on permits for drilling and uncertainty surrounding the construction of oil and gas pipelines all severely limit our potential to achieve energy dominance and promote economic growth.

Have We Overestimated the Pace of the Energy Transition?
Many opponents of domestic oil and gas development have argued that by accelerating the production of electric vehicles, accompanied by a rapid buildout of wind and solar resources, we can eliminate the need for domestic oil and gas production. This strategy, however, at least in the near term, has proven to be unrealistic. The energy transition is going to take time, likely many decades after 2050, and will prove more costly and elusive than current expectations. More importantly, policy measures to accelerate the transition will undermine the ability of energy markets to supply consumers with reliable and reasonably priced energy, especially in times of supply disruptions. The long history of energy development shows that most new energy sources are additive rather than substituting for legacy fuels.

What I would like to do today is take the Committee through a series of Figures and Tables that document the challenges we face, the benefits of expanding domestic oil and gas production (and the essential infrastructure to distribute the production), and its likely value to the national economy.

Figure 1 shows the massive worldwide investment that has been made to accelerate the energy transition to a future of low-carbon fuels and technologies. According to reporting by Bloomberg NEF, the world has spent $11.9 trillion on the energy transition from 2004 through 2023. This is a large funding commitment and little, if any, thought has been given to the effectiveness of such investments to affordability, sustainability and security of the energy systems deployed.

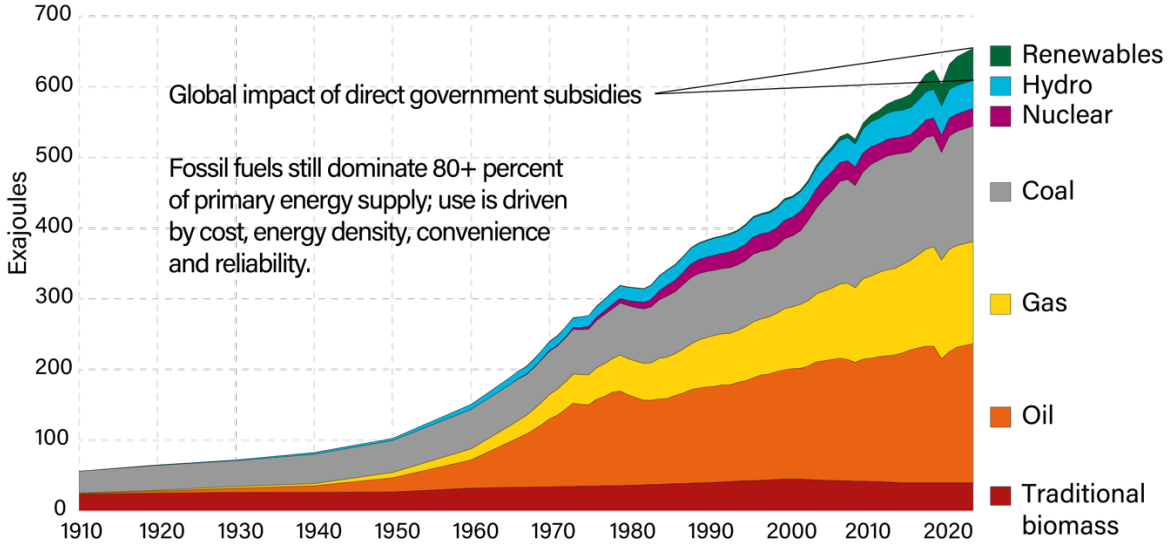
Figure 1. Global Investment in Energy Transition (2004-2024)



Graph Batt Odgerel (EPRINC), data from BNEF

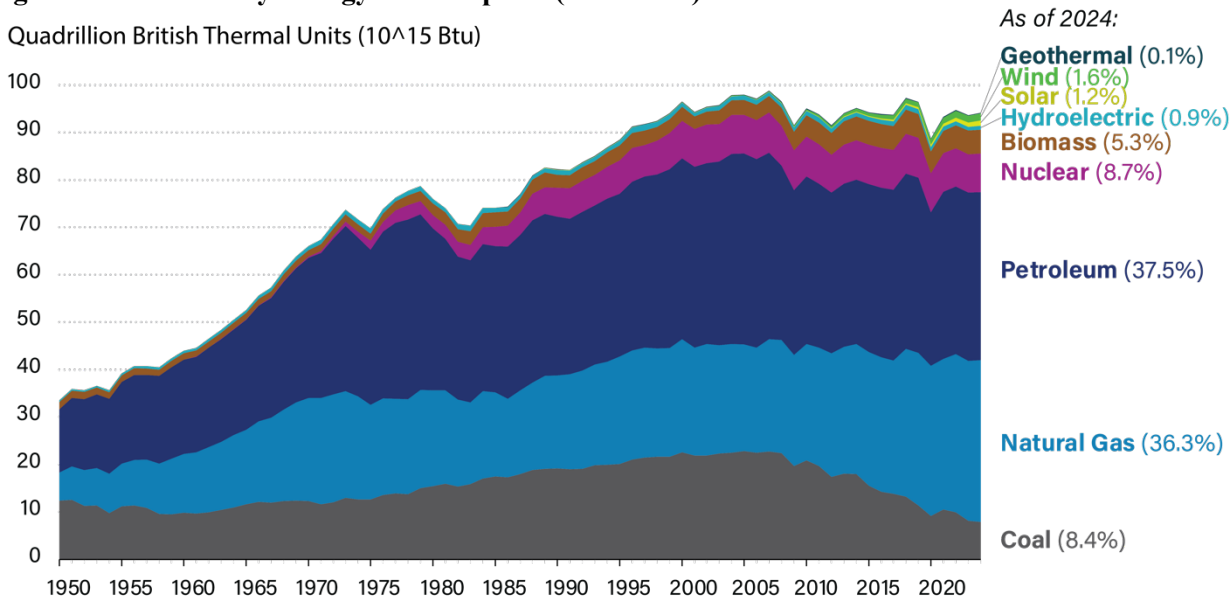
Figures 2 and 3 show the effectiveness of these investments in accelerating the energy transition. Even after these massive investments in so-called carbon-free technologies, both worldwide and domestic primary energy production continues to be dominated by fossil fuels and legacy carbon-free fuels such as hydropower and nuclear power.

Figure 2. World Primary Energy Consumption (1910-2023)



Graph by Batt Odgerel (EPRINC), data from Energy Institute, Vaclav Smil

Figure 3. U.S. Primary Energy Consumption (1950-2024)

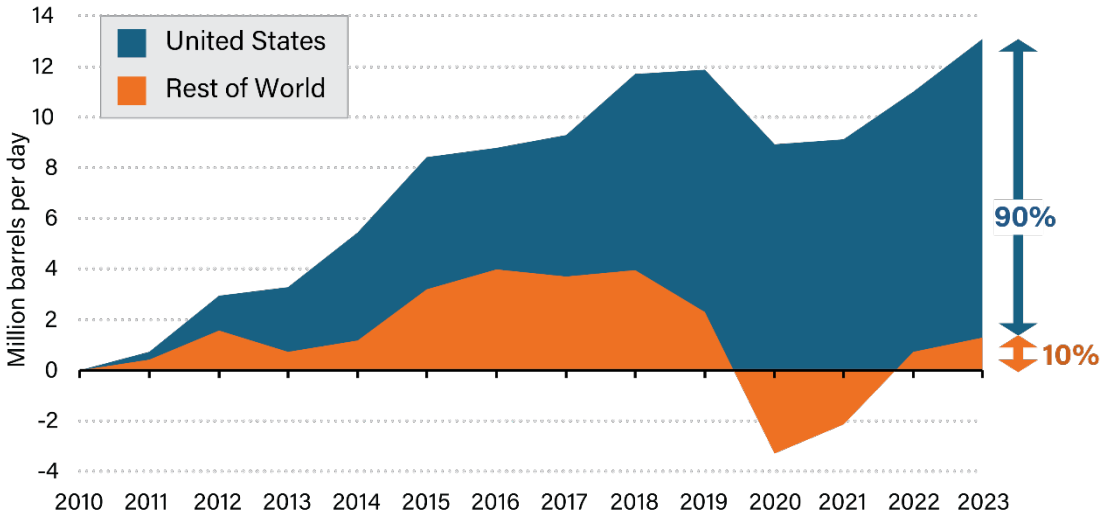


Graph by Batt Odgerel (EPRINC), data from U.S. EIA

Recent Performance of the U.S. Oil and Gas Resource Base

Figure 4, in contrast, shows the importance of investment in oil and gas production in the United States, almost entirely driven by private sector capital allocation. As shown in the Figure below, the central role of the United States was essential in keeping oil prices affordable between 2010-2023. In 2010, the U.S. produced less than 10% of the world's daily oil production. By 2023, the U.S. produced 20% of the world's oil each day and accounted for 90% of the increase in daily oil production. In the absence of this surge in U.S. petroleum output, gasoline prices would have been substantially higher, perhaps at least twice as high, had we not experienced such an extensive expansion of U.S. oil production.

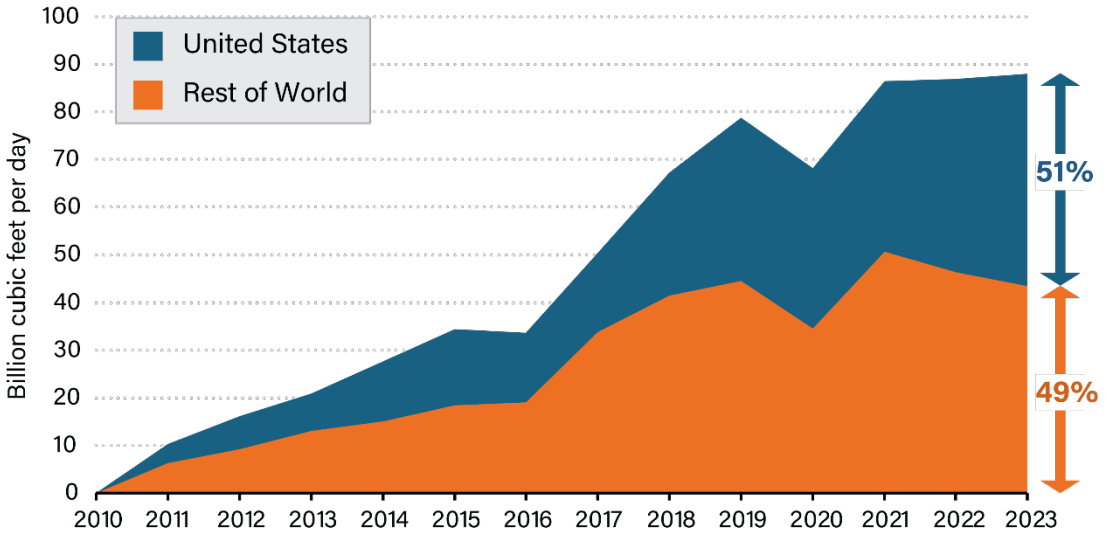
Figure 4. Change in Oil Production Relative to 2010



Includes crude oil, oil sands, condensates and NGLs.
Analysis by Glen Sweetnam and Batt Odgerel (EPRINC), data from Energy Institute

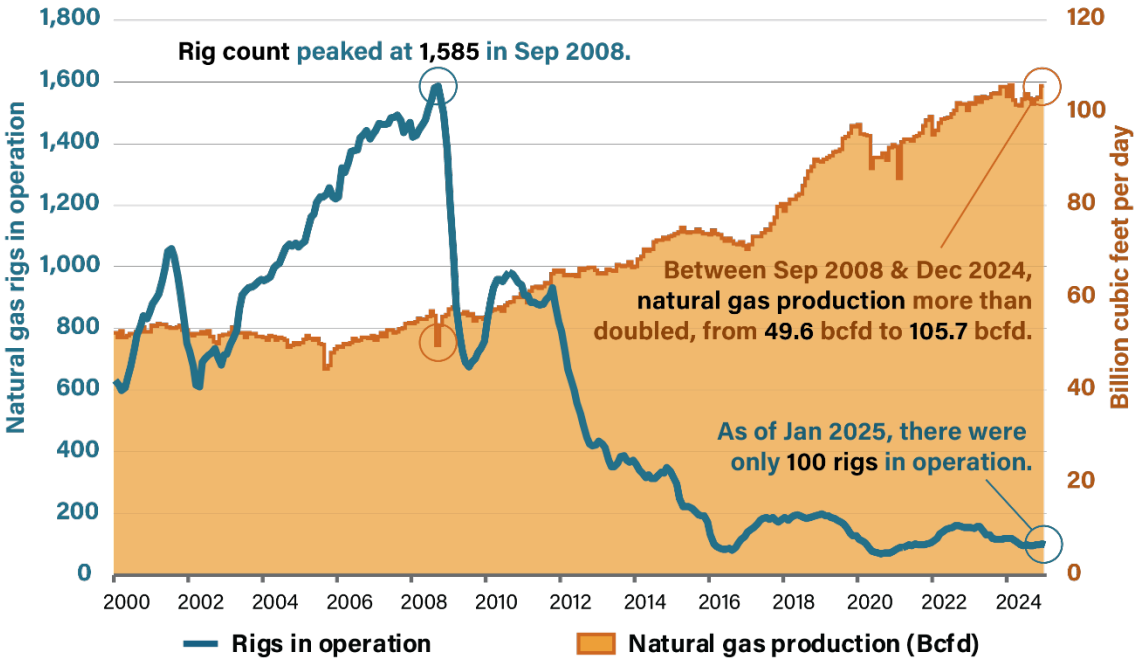
We see a similar pattern in the role of U.S. production of natural gas. As shown in Figure 5, U.S. natural gas production surged between 2010 and 2023, meeting over 50 percent of incremental worldwide demand across the 13 years, and was the essential development that enabled the U.S. to become the world's largest exporter of Liquified Natural Gas (LNG). The domestic natural gas sector also performed at a high level of efficiency. These efficiencies are related to technological advances, improved operational practices and higher volumes of associated gas. As shown in Figure 6 below, between September 2008 and 2024, U.S. natural gas production rose from 60 billion cubic feet per day (bcf/d) using over 1500 drilling rigs to 100 bcf/d in January 2024. The 2024 natural gas output was achieved with only 100 drilling rigs in operation.

Figure 5. Change in Natural Gas Production Relative to 2010



Analysis by Glen Sweetnam and Batt Odgerel (EPRINC), data from Energy Institute

Figure 6. U.S. Natural Gas Production Efficiency (2000-2024)



Analysis by Batt Odgerel (EPRINC), data from U.S. EIA

Estimates of Higher Production and Revenues from Public Lands

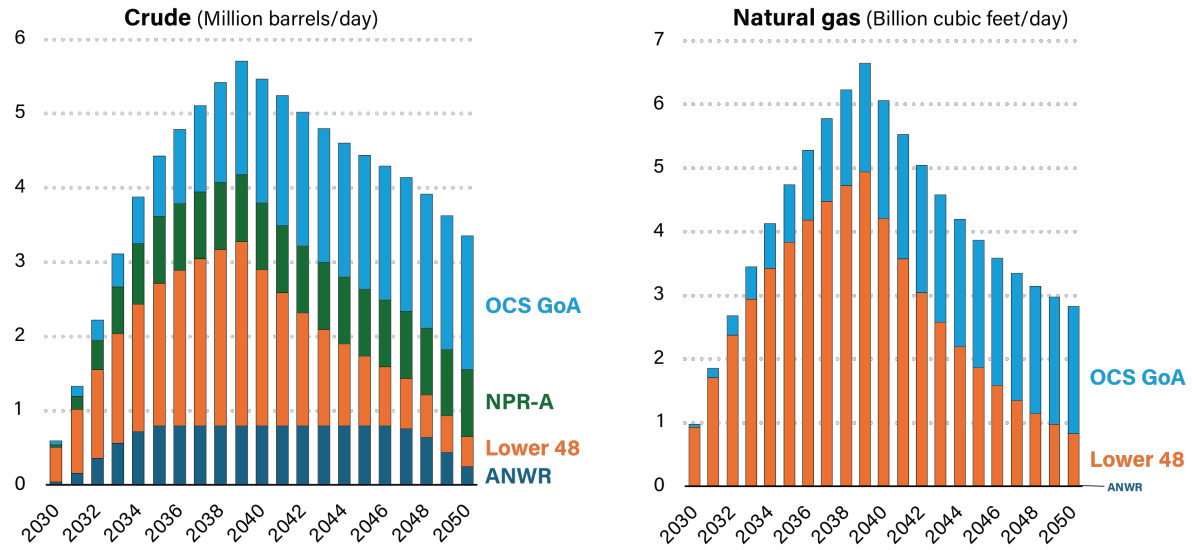
EPRINC recently undertook a comprehensive analysis of the potential for higher oil and gas production and revenues to the federal government from expanded access to public lands prospective for oil and gas development. We evaluated an aggressive leasing schedule opening new oil and gas prospects on public land, divided into five regions: the OCS Gulf of America, OCS Alaska, National Petroleum Reserve Alaska (NPR-A), the Arctic National Wildlife Refuge (ANWR), and the Lower 48 states.

In each of these regions, a representative project was created based on the regions' recent past resource production profile, geological reserve size and above-ground acreage, total costs from capital requirements, and operating and freight expenditures. For an input crude oil and natural gas benchmark price, we modeled revenues every year of the project's lifetime, which yielded an estimate of the expected bonus bid, rents, and royalties paid to the federal government each year. In addition, typical employment information gives figures for jobs created, and federal revenue from corporate and individual taxes.

The results of this analysis concluded there would be sizeable industry interest in new leases, with federal revenue expected from new leases in the Lower 48 estimated at $64 billion, the Gulf of America at $30 billion, and NPR-A at $15 billion. These projects combined are also expected to create almost 200,000 short-term construction jobs, and 7500 long-term operation jobs.

There is considerable uncertainty for ANWR given the lack of exploration there, however, if figures are in line with the geographically similar Willow project in NPR-A, the federal government would be expected to receive $13 billion in potential additional revenue and employment effects of 12,500 short term and 1500 long term high paying jobs in the region. High operational costs in OCS Alaska are challenging and make most projects unprofitable at oil below $100 a barrel and will most likely not generate substantial bonus bid interest. The total amount of additional crude oil brought to market under the accelerated leasing scenario reaches 4-6% of total daily global crude production beginning in 2034, exerting significant downward pressure on the price of oil and gasoline prices. Figures 7 and 8 show the resulting oil and gas production profiles and expected growth in revenues to the Federal government.

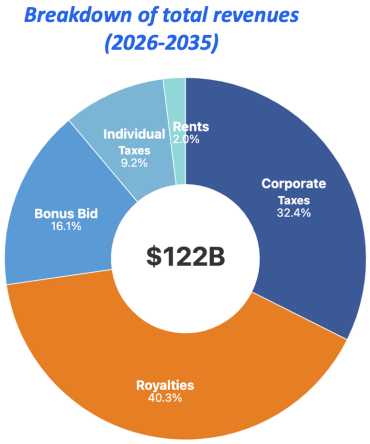
Figure 7. Potential Incremental Production from Increased Federal Leasing



Analysis by Matthew Sawoski and Max Pyziur, illustrated by Batt Odgerel (EPRINC)

Figure 8. Potential Growth in Federal Revenues (2026-2035)

Year	Bonus Bid	Rents	Royalties	Corporate Taxes	Individual Taxes	Grand Total
2026	$2.4B	$0.0B	$0.0B	$0.0B	$0.3B	$2.8B
2027	$3.1B	$0.1B	$0.0B	$0.0B	$0.8B	$4.0B
2028	$3.1B	$0.1B	$0.0B	$0.0B	$1.2B	$4.5B
2029	$1.6B	$0.2B	$0.0B	$0.0B	$1.5B	$3.2B
2030	$1.6B	$0.2B	$2.1B	$1.4B	$1.4B	$6.7B
2031	$1.6B	$0.3B	$4.4B	$3.2B	$1.3B	$10.7B
2032	$1.6B	$0.3B	$7.0B	$5.4B	$1.1B	$15.5B
2033	$1.6B	$0.3B	$9.7B	$7.9B	$1.2B	$20.7B
2034	$1.6B	$0.4B	$12.0B	$10.0B	$1.2B	$25.2B
2035	$1.6B	$0.4B	$14.0B	$11.6B	$1.2B	$28.7B
Total	**$19.7B**	**$2.4B**	**$49.2B**	**$39.5B**	**$11.2B**	**$122.0B**



Analysis by Matthew Sawoski and Max Pyziur (EPRINC)

Putting the Production and Revenue Estimates in Perspective

We understand some analysts might view these estimates as optimistic. However, there remains considerable evidence from previous forward-looking estimates of oil field performance that we are likely to underestimate production outcomes. Using methodologies like those EPRINC employed to calculate field performance in Alaska, Lower-48 and on the OCS, forward-looking oil field performance historically has consistently failed to account for improvements in discovery methods, technological advancements and even the wide array of industrial arts routinely used in overcoming impediments to achieve higher performance at the drill site. Figure 9 below provides an interesting retrospective on forecasting technological performance in the U.S. petroleum industry. This Figure summarizes the primary conclusions

from a paper[1] published on the EPRINC website by the late Richard Nehring. The study results evaluated the performance of two major and heavily studied U.S. oil and gas-producing regions, the Permian Basin and San Joaquin Valley.

The Nehring study gives us some remarkable conclusions from data sets drawn from over one million holes drilled before the breakthroughs in the so-called Shale Revolution. He evaluated likely future production in the year 2000 from data sets in 1964 and then with field updates in 1982. Drawing on the Hubbert recovery model (quite like the EPRINC approach for Alaska, OCS and onshore US), it became evident the model vastly underestimated expected production in the year 2000 even after an update in 1982. Production for 2000 was estimated initially at 44,000-112,000 barrels/day (using the 1964 data sets), then raised to 189,000 barrels/day using the 1982 data sets. But actual production in the year 2000 came in at 597,000 barrels/day. Similar results were seen in the Permian Basin as well.

Figure 9. History of Oil Production Forecasts Show Consistent Underestimation

	1964	1982	2000
SAN JOAQUIN VALLEY			
Cumulative Discoveries	7.7	11.8	16.1
Estimated Ultimate Recoverable	8.0 - 9.5	11.9 - 12.1	16.1 - 16.2
Cumulative Production as of	5.8	8.7	13.0
Year 2000 Production as Projected in (Thousand Barrels/Day)	**44 – 112 (forecasted)**	**189 (forecasted)**	**597 (actual in 2000)**
PERMIAN BASIN			
Cumulative Discoveries	17.6	27.9	35.2
Estimated Ultimate Recoverable	19 – 27.5	28.5 – 30.5	35.8 – 37.5
Cumulative Production as of	10.5	22.4	30.2
Year 2000 Production as Projected in (Thousand Barrels/Day)	**162 – 479 (forecasted)**	**326 – 479 (forecasted)**	**910 (actual in 2000)**

Source: Does the Hubbert Method Provide a Reliable Method for Predicting Future Oil Production, Richard Nehring, 2006, EPRINC.

Estimating the Value of Additional Oil & Gas Production to the National Economy

As detailed above, higher oil and gas production from expanded access to public lands prospective for oil and gas development generates federal revenues. In addition, there are indirect benefits attributable to the effects of this incremental oil production on world oil markets, the U.S. economy, and additional federal revenues. Estimating these effects requires an understanding of the relationship between U.S. oil production and world oil prices. It also requires an estimate of the effects of world oil prices on U.S. Gross Domestic Product (GDP).

To address the relationship between U.S. oil production and world oil prices, EPRINC employs a simple economic model of long-term world oil prices that spotlights the effect of changes in the U.S. oil supply curve on the incentives for OPEC+ to reduce their oil production to increase their profits.

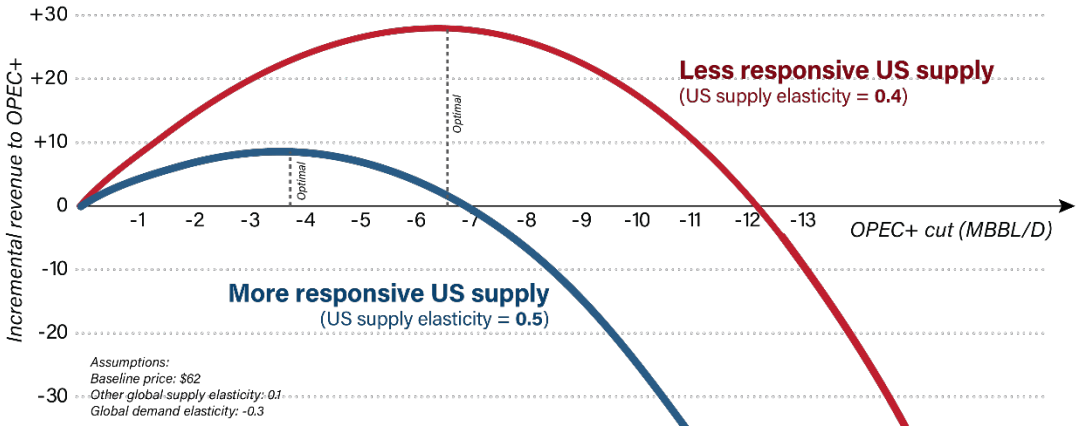
OPEC+ is an alliance of the Organization of the Petroleum Exporting Countries (OPEC) and other oil-producing nations. The alliance includes the 13 OPEC members (Algeria, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, the Republic of the Congo, Saudi Arabia, the United Arab Emirates, and Venezuela) plus ten non-OPEC countries (Azerbaijan, Bahrain, Brunei, Kazakhstan, Malaysia, Mexico,

[1] Richard Nehring, *"Does the Hubbert Method Provide a Reliable Means of Predicting Future Oil Production?"* (2006), EPRINC, Washington, DC, https://eprinc.org/wp-content/uploads/2023/08/HubbertMethod_Nehring.pdf.

Oman, Russia, South Sudan, and Sudan). The primary goal of OPEC+ is to coordinate oil production policies and influence global oil prices. Figure 10 shows the relationship between the aggregate, price elasticity of U.S. oil supplies and the economic benefits to OPEC+ of coordinating production cuts to increase the profits of its members. In the case where U.S. supply is relatively less responsive to changes in oil prices (red curve, supply elasticity = 0.4), OPEC+ maximizes its profits by reducing production by 6.5 million barrels per day (MB/D). In the case where U.S. supply is relatively more responsive (blue curve, supply elasticity – 0.5), OPEC+ makes less profit if it cuts production by 6.5 MB/D. The profit-maximizing reduction is 3.7 MBD.

Oil prices are determined by many factors including short-term global oil demand, OPEC+ and non-OPEC+ supplies, oil inventories, expected economic growth, and geopolitics, but it is undeniable that the incentive for OPEC+ to cut production to raise oil prices and increase their profits depends critically on the responsiveness of U.S. oil supplies to changing world oil prices. As the price responsiveness of U.S. oil supplies increases, the power of OPEC+ to increase its profits through production cuts falls. In this way, expanded leasing of prospective federal lands makes the U.S. oil supply more price elastic and undercuts OPEC+'s incentive to raise prices.

Figure 10. Incremental Revenue to OPEC+ from Their Oil Production Cuts



Analysis by Glen Sweetnam and Batt Odgerel (EPRINC)

To estimate the effects of changing oil prices on the U.S. economy, we rely on recent work by economists at Oak Ridge National Laboratory (ORNL). In their paper, *Sensitivity of the U.S. economy to oil prices controlling for domestic production and imports*,[2] Gbadebo Oladosu and his co-authors demonstrate that the U.S. economy benefits from lower oil prices even as it has become a net oil exporter. The quantification of these benefits is included in the estimates shown in Figure 11, which combines the results of the EPRINC model of world oil prices and the sensitivity estimates of the ORNL team.

We estimate that increasing the elasticity of U.S. oil supplies reduces the profit-maximizing price for OPEC+ by approximately $5 per barrel, which increases annual U.S. GDP and federal revenues by $823 billion and $148 billion, respectively. Conversely, making U.S. oil supplies less responsive to oil price changes—by restricting federal oil leases, increasing permitting delays, and otherwise inhibiting U.S. oil development and production—raises world oil prices and reduces both U.S. economic growth and federal tax revenues.

[2] Gbadebo Oladosu, Paul Leiby, Rocio Uria-Martinez, and David Bowman, *"Sensitivity of the U.S. Economy to Oil Prices Controlling for Domestic Production and Imports," Energy Economics* 115 (2022): 106355, https://doi.org/10.1016/j.eneco.2022.106355.

Figure 11. Elastic Supply Disincentivizes OPEC+ Production Cuts

	Normal US Supply	***More Elastic* US Supply**	***Less Elastic* US Supply**
Inputs			
Base Oil Price *(USD/Barrel)*		62	
Global Demand Elasticity		-0.3	
Rest of World Supply Elasticity		0.1	
U.S. Supply Elasticity	0.4	**0.5**	**0.3**
Outputs			
Optimal OPEC+ Cut *(Million Barrels/Day)*	-6.6	**-3.8**	**-9.5**
Price After OPEC+ Cut *(USD/Barrel)*	72.3	**67.4**	**78.5**
Incremental Revenue for OPEC+ *(Daily, USD Million)*	28	**9**	**64**
Change in GDP *(10 Years, USD Billion)*	N/A	**+823**	**-1378**
Change in Federal Revenues *(10 Years, USD Billion)*	N/A	**+148**	**-248**

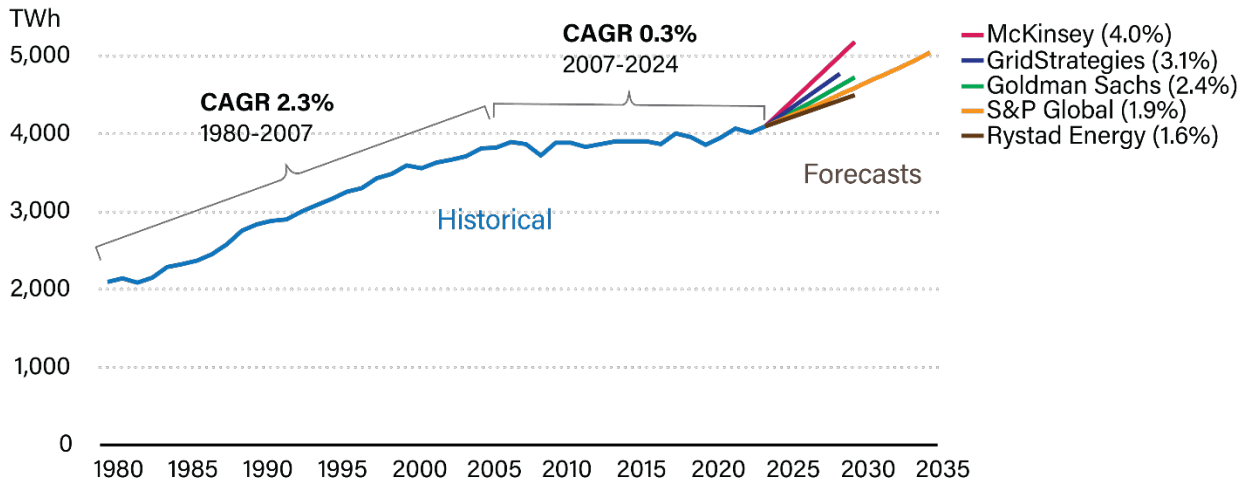
Analysis by Glen Sweetnam and Batt Odgerel (EPRINC)

Addressing Surging Electric Power Demand

Rising population, economic growth, advanced manufacturing, growing power requirements for EVs, and the massive power requirements for Artificial Intelligence (AI) applications are all driving increases in U.S. power consumption. According to the U.S. Energy Information Administration, U.S. power consumption will rise to record highs in 2024 and 2025. EIA projected power demand will rise to 4,096 billion kilowatt-hours (kWh) in 2024 and 4,125 billion kWh in 2025. That compares with 4,000 billion kWh in 2023 and a record 4,067 billion kWh in 2022.

Figure 12 shows recent forecasts of U.S. power demand by multiple companies that reinforce the EIA's outlook as well as the industry's consensus on growing U.S. power demand. Meeting this demand offers considerable promise for more rapid economic growth and a dynamic economy. Unfortunately, the U.S. power sector is facing a wide range of challenges, as dispatchable power has not been adequately developed and managing intermittent power is becoming more expensive. Rising power requirements present a host of challenges to reduce the risks of supply interruptions (blackouts) and escalating costs.

Figure 12. U.S. Electricity Load Growth Forecasts



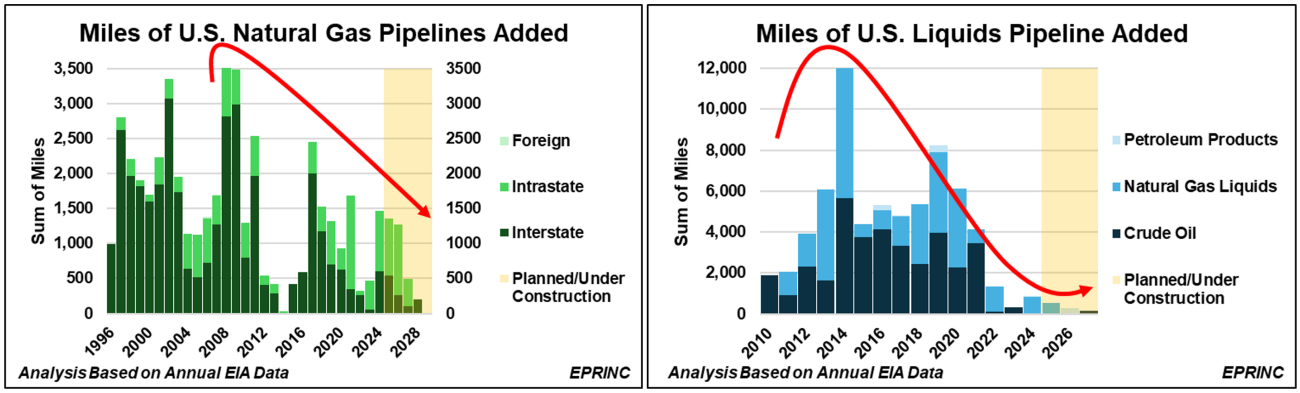
Analysis by Batt Odgerel (EPRINC), data from various sources

The North American Electric Reliability Corp. (NERC) at the end of 2024 alerted the country that the entire electricity supply chain needs to undertake emergency action to bolster the reliability of the national electric grid. The December 2024 NERC assessment pointed out that half of the U.S. electric grid could see energy shortfalls in the next five to ten years, particularly under extreme weather conditions. According to NERC, peak summer demand is forecast to rise by more than 122 GW in the next decade, adding 15.7% to current system peaks, and generation retirements of up to 115 GW are possible by 2034.

U.S. power markets have been distorted by federal and state policies that undermined efforts to build out more dispatchable power. Under some circumstances, renewable, intermittent power can be cost-effectively integrated into the grid, but it can also be costly and less reliable. There is a long list of potential remedies for these challenges, but in the very near term, some combination of extending the life of existing coal-fired power generation and the deployment of new gas generation will be required to bolster grid reliability and deliver new generating capacity.

We are blessed with vast natural gas resources which can be produced and distributed at low cost. However, we are facing permitting constraints at both the local and federal levels for new natural gas pipelines. Adding more natural gas generation capacity will require not only producing more natural gas but also building out pipelines that can deliver gas to where it is needed. Figure 13 illustrates the problem as plans to build more long-distance pipelines continue to face often insurmountable legal challenges.

Figure 13. U.S. Pipeline Capacity Additions (1996-2028)



A recent study by S&P Global outlined some of the benefits of regulatory reforms that would permit additional pipeline construction. For example, S&P Global pointed out that due to pipeline constraints, Northeast U.S. residents pay the highest natural gas prices in the country. During peak winter periods, wholesale natural gas in Boston and New York prices are 166% and 144% more expensive, respectively, than the national benchmark price.

Expanding pipeline capacity out of the low-cost Marcellus region in Pennsylvania would save American consumers an average of $5.5 billion annually, totaling to nationwide energy cost reductions of $76 billion through 2040. Eighty percent of those cost reductions occur in the form of lower prices for industrial and commercial gas consumers, and lower electricity prices for all. Specifically, gas consumers in the industrial and commercial sectors benefit from $22 billion and $12 billion of savings, respectively, during the period, while electricity consumers save $27 billion.

An additional $15 billion of cost savings will flow to residential gas users, with customers in the Northeast benefiting the most. Natural gas prices in Boston and New York would fall by an average of 27% and 17%, respectively, with peak heating month declines of 30% and 20%. These pipeline-driven price reductions

will save residential gas consumers in New England $1,435 through 2040, while New York and New Jersey customers save $813.

Williams CEO Alan Armstrong says permitting costs have become a bigger burden than potential tariffs, revealing that for one of the company's projects, the cost of securing permits was twice the price of building the pipeline itself. Speaking at CERAWeek by S&P Global on March 12, Armstrong noted that he would prefer a 25% tariff if it meant expediting the permitting process, emphasizing how regulatory hurdles are delaying critical infrastructure.