U.S. House Committee on Energy and Commerce
Subcommittee on Energy
"Powering America's Future: Unleashing American Energy"
February 5, 2025
Documents for the Record

1. A letter from The Marks Collaborative to the Honorable Joseph R. Biden and the Honorable Michael S. Regan, January 17, 2024, submitted by the Rep. Lee.
2. A letter from the Digital Power Network addressed to the Subcommittee on Energy, submitted by the Majority.
3. A letter from the Industrial Energy Consumers of America addressed to Chairman Latta and Ranking Member Castor, submitted by the Majority.
4. A letter from the National Association of Convenience Stores addressed to Chairman Latta and Ranking Member Castor, submitted by the Majority.
5. A letter from Fidem Energy addressed to Chairman Latta, Chairman Guthrie, Ranking Member Pallone, and Ranking Member Castor, submitted by the Majority.
6. A document from Colorado Energy Office about frozen funds, submitted by Rep. DeGette
7. An article from Heatmap entitled "Trump is about to Wreck U.S. Oil Refineries," submitted by the Minority
8. A letter from eight trade associations addressed to the Honorable Mike Crapo, the Honorable Jason Smith, the Honorable Ron Wyden, and the Honorable Richard Neal, January 7, 2025, submitted by the Minority
9. A report from Aurora Energy Research, entitled "Impact of reform to clean energy tax credits on investment, jobs and consumer bills, submitted by the Minority.
10. A letter from the American Exploration & Production Council, addressed to Chairman Latta and Ranking Member Castor, submitted by Rep. Pfluger.
11. A statement from Secretary Granholm, submitted by Rep. McClellan

James “Spider” Marks
Retired U.S. Army Major General
President of The Marks Collaborative
Leesburg, Virginia

January 17, 2024

The Honorable Joseph R. Biden
President of the United States
1600 Pennsylvania Avenue NW
Washington, DC 20500

The Honorable Michael S. Regan
Administrator of the Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Dear President Biden and Administrator Regan,

In light of your recent policy determinations to incentivize rapid electric vehicle (EV) adoption in the United States, we are writing to express our concerns with how these choices will negatively impact our national security given the dominance by the People’s Republic of China (China) in EV supply chains.

There is no doubt EVs will play a significant role in diversifying America’s transportation systems. Yet we believe your plans will rush our transition to EVs before the infrastructure necessary to support it is in place. This trajectory will only position the U.S. to become more reliant on China for critical minerals and manufacturing that are necessary for the rapid expansion of EV markets this administration envisions. And even more concerning is the fact that this reliance hinges upon China’s goodwill to export those minerals and manufactured goods to the U.S. This will undoubtedly open the U.S. up to economic manipulations by China, identical to what Russia is doing with Ukrainian grain exports, and a major threat to our national security. We do not believe now is the time for us to make ourselves vulnerable to such easy political pressures.

Your EV plans go far beyond the provisions of the 2021 infrastructure law and the 2022 Inflation Reduction Act, with regulatory initiatives in the queue that will only intensify America’s vulnerability to political interference by the Chinese Communist Party. Last year, the Environmental Protection Agency (EPA) announced a proposed regulation to establish strict tailpipe emissions regulations on gasoline and diesel-powered vehicles that would force up to two-thirds of new vehicles sold in the U.S. to be electric by 2032.

At a nearly tenfold increase over current electric vehicle sales, this proposed rule is a clear example of tone-deaf policymaking that favors the geopolitical advantages currently held by China in this market. We would be exposing our economy and national security interests if we consciously link America’s economic and transportation stability to the enterprise of a country you yourself described as an economic “ticking time bomb.”

Though a deliberate and methodical strategy, China has established a formidable foothold in both the up-and downstream segments of electric vehicle value chains. Chinese foreign direct investment in the EV market surged more than forty-fold from $605 million in 2016 to over $24 billion in 2022.

Currently, China is possessing around 36 percent of the world's known rare earth reserves, controls more than 70 percent of the world's extraction capability and nearly 90 percent of the world's processing capacity. This is significant as EVs use about six times more rare minerals than conventional cars because of the batteries. China has worked for decades to develop a strategic dominance over these crucial and rare minerals.

Yet because the EPA's proposed rule will mandate more EVs in American garages, it will also effectively mandate greater American household dependence on the cooperation of the Chinese.

The International Energy Agency (IEA) recognized this in July, releasing its inaugural Critical Minerals Market Review. The analysis points out through rigorous and detailed analysis the overwhelming market dominance China holds over critical minerals globally and by that, their control over the projected growing demand, supply, and investment for these materials.

In the downstream, while the U.S. makes about one percent of the world's battery cathodes, China makes between 73 and 99 percent of those cathodes, depending on the type, while also being the predominant producer of battery separators (74%), battery electrolytes (82%), and battery anodes (92%). All this on top of the fact Chinese companies, many with direct control by the Chinese Communist Party, are attempting to expand their presence in the U.S. EV battery manufacture and assembly plants and facilities.

Importantly, these national security concerns are not theoretical. On August 1, 2023, China imposed strict curbs on the exports of gallium and germanium – two minerals required in EV batteries – that immediately led to a 43 percent rise in the cost of gallium and 9.1 percent rise in the cost of germanium. It's clear that China's positions in EV battery technology and manufacturing is a challenge we must address before we push ahead with electrification strategies and regulations that will artificially increase EV demand.

Investments – both private and public – separate from Chinese interference is key to combatting their foothold in the EV supply chain and strengthening American competitiveness. This should start with enabling more domestic production with a streamlined, timely, and predictable permitting process. Once our regulatory system is poised to approve new projects, we can better facilitate new ventures and investments that will allow us to begin competing and perhaps eventually supplanting the current Chinese monopoly in this unique, but crucial, market. This would include bypassing the midstream processing (refining, alloying) currently dominated by China.

Frank Fannon, former U.S. Assistant Secretary of State for Energy Resources succinctly stated the U.S. should "readjust its thinking, reassess its allies and institutions and reinvent economic statecraft", and that this is the way free nations can "prevent China from using its market power to undercut and bankrupt mining investments at home and abroad."

In support of U.S. national security and economic stability, we strongly encourage you to consider the current state of play in the global marketplace and pursue domestic investment and infrastructure opportunities before we pursue a rushed EV policy. Your administration can start by reconsidering the EPA's proposed tailpipe emissions rule, which will further put the U.S. on a precarious path to dependance on China for America's EV supply chain.

Very respectfully,

James "Spider" Marks, Major General, U.S. Army (Ret)

Robert Harward, Vice Admiral, U.S. Navy (Ret)

Mastin Robeson, Major General, U.S. Marine Corps (Ret)

James J. Carey, Rear Admiral, U.S. Navy (Ret)

Thomas Magness, Colonel, U.S. Army (Ret)

Rob Maness, Colonel, U.S. Air Force (Ret)

Michael McKenna, Captain, U.S. Navy (Ret)

Ike Puzon, Captain, U.S. Navy (Ret)

Bob "Shoebob" Carey, Captain, U.S. Navy (Ret)

Andrew "Rocky" Raczkowski, U.S. Army (Ret)

Thomas Duffy, Commander, U.S. Navy (Ret)

Brigham A. McCown, Commander, U.S. Navy (Ret)

Ernesto Hernandez, Major, U.S. Air Force (Ret)

James McCormick, Captain, U.S. Army (Ret)

Sergio de la Peña, Colonel, U.S. Army (Ret)

Bentley B. Rayburn, Major General, U.S. Air Force (Ret)

E.G. "Buck" Shuler, Lieutenant General, U.S. Air Force (Ret)

CC: Jeffrey Zients, White House Chief of Staff

Dr. Lael Brainard, Director of the United States National Economic Council

Jake Sullivan, United States National Security Advisor

Chairman Thomas Carper, Senate Committee on Environment and Public Works

Ranking Member Shelley Moore Capito, Committee on Environment and Public Works

Chair Maria Cantwell, Sen. Committee on Commerce Science and Transportation

Ranking Member Ted Cruz, Sen. Committee on Commerce Science and Transportation

Chairman Joe Manchin, Senate Committee on Energy and Natural Resources

Ranking Member John Barrasso, Senate Committee on Energy and Natural Resources

Chairman Jack Reed, Senate Committee on Armed Services

Ranking Member Roger Wicker, Senate Committee on Armed Services

Chair Patty Murray, Senate Committee on Appropriations

Vice Chair Susan Collins, Senate Committee on Appropriations

Chairman Frank Lucas, House Committee on Science, Space, and Technology

Ranking Member Zoe Lofgran, House Committee on Science, Space, and Technology

Chair Cathy McMorris Rodgers, House Committee on Energy and Commerce

Ranking Member Frank Pallone, House Committee on Energy and Commerce

Chairman Mike Rogers, House Committee on Armed Services

Ranking Member Adam Smith, House Committee on Armed Services

Chairwoman Kay Granger, House Committee on Appropriations

Ranking Member Rosa DeLauro, House Committee on Appropriations

Janet McCabe, Deputy Administrator for the U.S. Environmental Protection Agency

Jennifer Granholm, United States Secretary of Energy

John Podesta, Senior Advisor to the President for Clean Energy Innovation

Ali Zaidi, White House National Climate Advisor

DPN Letter to the Subcommittee on Energy hearing titled *Powering America's Future: Unleashing American Energy*.

Dear Members of the Subcommittee on Energy,

Bitcoin mining facilities provide a framework for sustainable economic growth and will play a key role in unleashing American energy. Crypto mining data centers offer a unique advantage: a large flexible demand response. Unlike other industries, miners can scale energy use up or down in real time, reducing grid strain during peak demand which allows them to stabilize the grid, lower prices, and rely on a broad range of energy sources.

The computational structure of the mining process known as hashing allows the data centers to pause operations and continue when the demand is lower. When the grid is experiencing peak demand, Bitcoin miners can shut off their operations to reduce costs and stress to the grid. High demand can raise prices for consumers and makes the grid vulnerable to blackouts.

In addition to providing more economic certainty for both grid operators and energy consumers, Bitcoin data centers have begun a practice called "colocation" where they build their own energy infrastructure on site, often at the source of stranded energy that is not economically viable to deliver to market, which directly powers their mining operations. This reduces miners' reliance on the grid and keeps prices low and stable.

Miners also facilitate renewable energy adoption by consuming excess power from solar or wind resources during off-peak times. This flexible demand ensures renewable projects remain economically viable, encouraging further investment in clean energy. Many Bitcoin data centers are able to run largely on renewables and receive direct power from wind turbines, solar panels, and hydropower generators. Along with utilizing renewable energy as a power source, Bitcoin miners also mitigate methane emissions by using byproducts of oil production that otherwise would have been wasted. Two key features of Bitcoin data centers are their mobility and modularity, meaning they can capture methane emissions directly from oil wellheads and turn this into fuel rather than allowing those emissions to escape into the atmosphere.

Economically, the claim that mining offers "few jobs" dismisses its growing role in revitalizing communities. Miners repurpose old industrial sites, boost local tax revenue, create jobs in trades and energy management, and provide workforce training for transferable skills in data center operations. Many mining companies are also adopting carbon-neutral practices, aligning with state climate goals.

All of this makes the Bitcoin mining industry unique in its ability to employ a comprehensive energy approach that reduces waste, supports the grid, and combats energy price inflation.

Respectfully,

Cody Carbone

Cody Carbone
President
Digital Power Network

Industrial Energy Consumers of America (IECA)
The Voice of the Industrial Energy Consumers

1050 Connecticut Avenue, NW, Suite 500 • Washington, D.C. 20036
Telephone (202) 223-1420 • www.ieca-us.org

February 4, 2025

The Honorable Bob Latta
Chairman
House Subcommittee on Energy
Washington, DC 20515

The Honorable Kathy Castor
Ranking Member
House Subcommittee on Energy
Washington, DC 20515

Re: Subcommittee Hearing on "Powering America's Future: Unleashing American Energy" – Comments for the Record

Dear Chairman Latta and Ranking Member Castor:

As you consider legislative priorities for 2025, we urge you to implement an America "First" LNG Export Policy vs. an America "Last" Policy, which is what we have today.

One hundred percent of our members are manufacturing companies whose competitiveness is largely determined by the cost and reliability of natural gas and electricity.

First, we urge you to take action to insulate U.S. households and manufacturing companies from the impacts of increased LNG export volumes when U.S. inventories are low. The IECA "LNG Inventory Policy" is recommended.[1] This happened during the winter of 2021-2022 and natural gas prices rose over 300 percent and to some degree this winter. LNG exports are maximized during our winter heating season, which puts upward pressure on prices of natural gas and electricity (see Figure 1).

The U.S. Department of Energy (DOE) has already approved 48 billion cubic feet per day (Bcf/d) of LNG exports, a volume equal to 50.5 percent of 2023 net supply and substantially more than exports of gasoline and crude oil.[2] The U.S. only exports 10 percent of its gasoline. As of December 6, 2024, the U.S. exports only 23 percent of crude production and imports an equivalent of 44 percent of production.[3] For crude and gasoline, the U.S. has a Strategic Petroleum Reserve. There is no equivalent for natural gas. Consumers are completely exposed.

[1] America First LNG Inventory Policy, https://www.ieca-us.org/wp-content/uploads/LNG-Inventory-Policy-to-Insulate-the-US-Market-from-LNG-Export-Impacts.pdf
[2] Testimony of Brad Crabtree, Assistant Secretary of Energy for Fossil Energy and Carbon Management
U.S. Department of Energy, before House Committee on Oversight and Accountability, December 4, 2024, https://oversight.house.gov/wp-content/uploads/2024/12/Written-Testimony-Crabtree.pdf
[3] Table 1. U.S. Petroleum Balance Sheet, Week Ending 12/6/2024, U.S. Energy Information Administration, https://www.eia.gov/petroleum/supply/weekly/pdf/table1.pdf

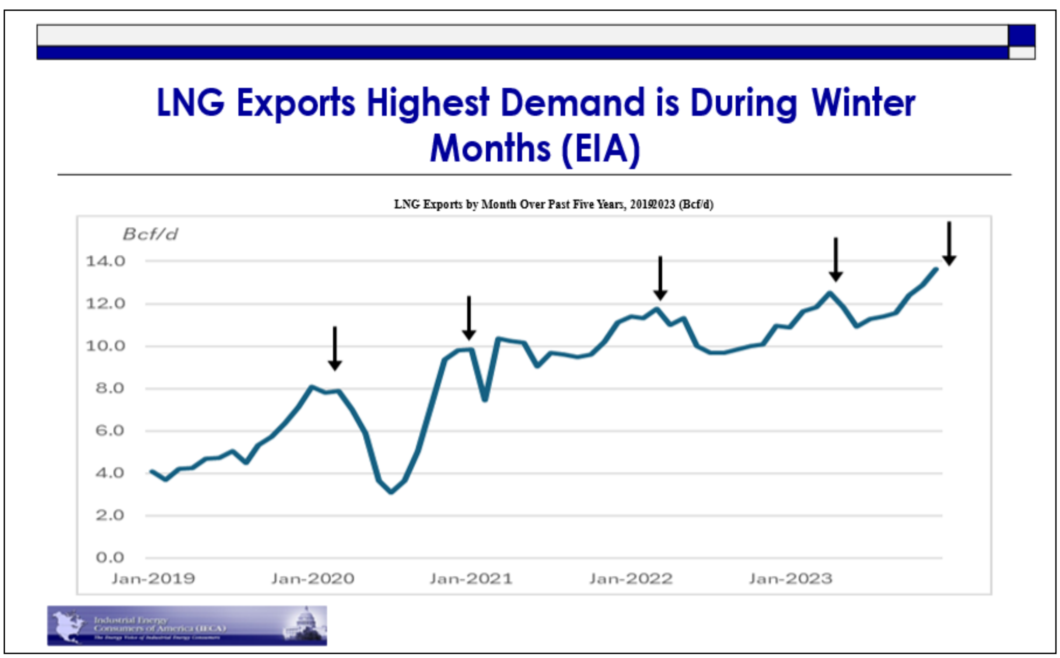
Second, we urge you not to change the Natural Gas Act (NGA) and remove consumer protections, as in H.R. 1, the Lower Energy Costs Act, Sec 10008, Unlocking Our Domestic LNG Potential. The NGA requires the DOE to determine whether applications to export are in the public interest for shipments to non-free trade agreement (NFTA) countries. About 80 percent of all exports are to NFTA countries.

Third, legislation that changes how the DOE reviews applications to export to NFTA countries should be opposed. For example, legislation that would require the use of macroeconomic modeling as a replacement for a public interest determination should be opposed. Macroeconomic models cannot model short-term market impacts and higher natural gas and electricity prices resulting from LNG exports.

Macroeconomic models do not address the fact that LNG shipments are maximized during our winter months, which puts upward pricing pressure on domestic prices. Macroeconomic models do not address the fact that LNG customers are price insensitive. They are countries and will pay any price to keep the lights on in their country.

The U.S. Energy Information Administration (EIA) has data that proves that LNG export volumes are highest during our winter peak demand season and puts upward price pressures on natural gas and electricity (see Figure 1). This is what is happening right now. In December 2024, U.S. LNG exports surged to a new high of 8.5 million metric tons, pushing the annual total up by 4.5 percent from 2023 and higher than in November 2024 at 7.75 million metric tons, contributing to soaring prices nationwide.[4]

FIGURE 1



[4] U.S. LNG Exports Surged at the End of 2024, Irina Slav, oilprice.com, January 3, 2025, https://oilprice.com/Latest-Energy-News/World-News/US-LNG-Exports-Surged-at-the-End-of-2024.html?utm_source=substack&utm_medium=email

LNG exports are insensitive to price and exacerbate structural reliability and price volatility risks for U.S. natural gas and electricity markets.[5] As LNG exports increase, they import global market volatility – a phenomenon that the U.S. market has been insulated from historically, especially when U.S. inventories are low.[6]

We also question the wisdom of the U.S. allowing China to secure 34 long-term contracts, equal to 5.32 Bcf/d for periods of up to 25 years, a volume equal to 36.8 percent of U.S. operating capacity. This volume does not account for contracts with U.S. multinational oil companies, and it does not account for spot purchases. China has contracted more volume than any other country. China is not using LNG to displace coal. They are using it to expand their manufacturing industries to compete with U.S. manufacturers.[7] The American Security Project report states that the "United States is sacrificing its strategic advantage in global energy markets" and China is engaged in "predatory" resale of U.S. LNG.[8] According to the Baker Institute for Policy "Chinese buyers account for almost 25 percent of the volume of long-term contracts entered into by LNG export facilities affected by the DOE's LNG export pause."[9]

For the reasons above, IECA urges Congress to put in place a policy to insulate the U.S. from the negative impacts of increased LNG exports. Our recommended policy is an LNG Inventory Policy that is an America First policy.[10]

Sincerely,

Paul N. Cicio
Paul N. Cicio
President & CEO

cc: House Committee on Energy and Commerce

The Industrial Energy Consumers of America is a nonpartisan association of leading manufacturing companies with $1.3 trillion in annual sales, over 12,000 facilities nationwide, and with more than 1.9 million employees. One hundred percent of IECA members are manufacturing companies whose competitiveness is largely determined by the cost and reliability of natural gas and electricity. IECA's

---

[5] LNG Exports do Negatively Impact Consumers: https://www.ieca-us.org/wp-content/uploads/04.17.24_LNG-Exports-Do-Impact-U.S.-Prices.pdf
[6] Hearing on "Exposing the Truth on LNG: How the Administration Played Politics with America's Energy Future," https://www.ieca-us.org/wp-content/uploads/12.04.24_LNG-Hearing_House-Oversight-1.pdf
[7] LNG is not displacing coal in China's power mix, Institute for Energy Economics & Financial Analysis, June 25, 2024, https://ieefa.org/resources/lng-not-displacing-coal-chinas-power-mix
[8] Perspective - The U.S.-China LNG Export Dilemma: Reclaiming Leverage in an Imbalanced Trade Relationship, American Security Project, October 16, 2024, https://www.americansecurityproject.org/us-china-lng-competition/
[9] Is the US Preparing to Ban Future LNG Sales to China?, Baker Institute for Policy, April 25, 2024, https://www.bakerinstitute.org/research/us-preparing-ban-future-lng-sales-china
[10] IECA LNG Inventory Policy, https://www.ieca-us.org/wp-content/uploads/LNG-Inventory-Policy-to-Insulate-the-US-Market-from-LNG-Export-Impacts.pdf

sole mission is to reduce and avoid energy costs and increase energy reliability through advocacy in Congress and regulatory agencies, such as the Federal Energy Regulatory Commission (FERC). IECA membership represents a diverse set of industries including chemicals, plastics, steel, iron ore, aluminum, paper, food processing, fertilizer, insulation, glass, industrial gases, pharmaceutical, consumer goods, building products, automotive, independent oil refining, and cement.

February 4, 2025

VIA ELECTRONIC MAIL

The Honorable Bob Latta
Chairman, Subcommittee on Energy
House Committee on Energy & Commerce

The Honorable Kathy Castor
Ranking Member, Subcommittee on Energy
House Committee on Energy & Commerce

Re: Hearing on *Powering America's Future: Unleashing American Energy* Before the House Committee on Energy and Commerce, Subcommittee on Energy

Chairman Latta, Ranking Member Castor, and Members of the Subcommittee –

On behalf of the National Association of Convenience Stores (NACS), thank you for the opportunity to offer our industry's perspective as you explore the ways in which expanding domestic energy production and delivery can advance American economic and security interests.

The convenience retailing industry is responsible for more than 80% of the motor fuel sold in the United States. As such, NACS members can and do serve as essential points of delivery for the increasingly varied sources of transportation energy—including gasoline, diesel fuel, propane, natural gas, biofuels, hydrogen, and electricity—relied upon daily by American households and businesses. A healthy trade in these diverse energy products is fundamental to our members' and their customers' ability to survive and thrive in a modern economy, and NACS appreciates the subcommittee's willingness to investigate those issues.

To that end, NACS is broadly supportive of the following policy principles that we urge you to consider as the subcommittee undertakes its work in the 119th Congress:

- **Broad and Deep Supply –** Convenience retailers' success begins with the upstream partners from whom they obtain their transportation energy products. Here, policies that foster a broad supply across both traditional and alternative types of fuel, and a deep supply capable of withstanding production or distribution constraints, ensure a steady and affordable source of transportation energy for retailers and their customers.

- **Stable and Functional Markets –** In such a highly regulated industry, our members can most efficiently deploy capital when operating within regulatory frameworks that promote certainty and transparency for market participants. This goal is best served when the rights and obligations of regulated parties are settled in a timely fashion, are administered consistently from year to year, and are subjected to competitive market forces.

- **Robust Infrastructure –** To effectively serve the motoring public, convenience stores depend on a diverse array of transportation energy infrastructure to move fuels from their source to point of sale. For vehicles powered by liquid and gaseous fuels, this means a reliable network of railways, pipelines, shipping, and trucking. For electric drivetrains, this means a resilient grid with adequate capacity, connectivity, and redundancy.

- **Level Playing Fields –** Finally, to maximize micro- and macro-economic benefits in the transportation energy arena, all channels of trade—including public and quasi-public market participants, like local governments and utility companies—must be treated on equal footing, and none should be allowed to use their market position to create or perpetuate unfair competition. Likewise, policies that pick winners and losers amongst the competing types of motor fuels—rather than setting neutral, performance-based standards toward which the market can direct its research and development capital—will discourage private investment and undermine the long-term success of American energy policy.

Thank you, again, for your focus on the critical energy issues facing our country. NACS stands ready to serve as a resource as Congress explores the solutions that will ensure a prosperous and secure energy future for all Americans.

Sincerely,

Matthew T. Durand
Deputy General Counsel

The Honorable Brett Guthrie
Chairman
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Frank Pallone
Ranking Member
Committee on Energy and Commerce
2322A Rayburn House Office Building
Washington, DC 20515

The Honorable Bob Latta
Chairman, Subcommittee on Energy
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Kathy Castor
Ranking Member, Subcommittee on Energy
Committee on Energy and Commerce
2322A Rayburn House Office Building
Washington, DC 20515

Ben Johnston

President
Fidem Energy

Before the House Committee on Energy & Commerce
Subcommittee on Energy

Washington, DC

February 5, 2025

"Powering America's Future: Unleashing American Energy"

As President of Fidem Energy, I am pleased to have the opportunity to provide some comments for the record to the hearing "Powering America's Future: Unleashing American Energy" before the House Committee on Energy and Commerce Subcommittee on Energy.

Fidem Energy is a small business based in East Tennessee that creates jobs and invests in the community by developing natural gas facilities at landfills across the Southeast United States. Fidem's innovative process, which is very similar to that of traditional drilling for fossil based natural gas, turns raw landfill gas into a stable and sustainable energy source. The end result, as shown by our recently-constructed and operational facility, provides renewable natural gas back into the commercial pipeline system for use by consumers in the region. Fidem Energy fully supports expanding our country's energy production and delivery in an effort to lower costs, fuel economic growth, and protect national security. We appreciate the opportunity to introduce Fidem Energy and join the dialogue on how companies like ours can help to "unleash American energy" and participate in being a domestic energy source for decades to come.

*   *   *

Renewable natural gas (RNG) is a clean and reliable fuel source that provides sustainable energy. RNG is derived from biogas – mainly methane – that is produced through anaerobic digestion and commonly emitted from landfills, wastewater treatment facilities, and other sources where the decomposition of organic waste is present. The biogas can be refined, cleaned and conditioned, and delivered to end users through injection into a commercial pipeline system or used onsite or locally.

With regard to landfill gas, processing the landfill methane allows for capturing natural emissions from a landfill that would otherwise be emitted into the atmosphere, and turned into a sustainable energy source. Typically, the geographic beneficiary would be any state, region, or municipality, and its residents, where a biogas-to-energy project is being developed. (In many cases, RNG projects are located in rural areas.) There are approximately 150 new RNG facilities under construction across the country and an additional over 250 in the planning and development stage.

At Fidem Energy[1], we focus on RNG by turning landfill gas into a clean and reliable energy source that can be injected into the commercial pipeline. Our system involves taking the raw landfill gas (approximately 50% methane unprocessed), and cleaning and conditioning the gas to pipeline quality specifications of greater than 98.5% methane. The innovative process utilizes a two-stage pressure swing

[1] Established in 2021, Fidem Energy is a developer of biogas to renewable energy projects. With over 100 years of combined solid waste experience, our team is uniquely qualified to manage the development of biogas to RNG projects. Our predecessor company, Santek Waste Services, LLC was a full-service, vertically-integrated solid waste management company, focusing on waste collection, landfill management and transfer station operations. Established in 1987, Santek operated in a nine-state region and managed over 2,000,000 tons of refuse across 28 solid waste facilities. Santek was one of the largest privately held solid waste companies in the southeast, and one of the largest privately held operators of municipally owned landfills in the country.

adsorption (PSA) technology, with the first stage removing CO_2 and the second stage removing nitrogen, achieving pipeline quality product gas. Once processed, the renewable natural gas is then injected into a commercial pipeline system for end use.

Fidem's innovative processes to capture and upgrade landfill gas is very similar to that of traditional drilling for natural gas. Each process requires dehydration and removal of contaminants to result in clean and reliable energy. At the same time, the RNG process reduces methane emissions and improves the air quality of its community.

Fidem recently constructed and began operating its first energy processing facility in Bradley County, TN, that utilizes biogas to produce energy. After years of planning, investment and construction, the RNG facility provides up to 500,000 MMBtus to the nearby interstate natural gas pipeline, serving the community as a domestic energy source for decades to come. This Fidem facility is a win-win proposition – it captures the natural emissions from a landfill that would otherwise be emitted into the atmosphere and turns it in to a stable and sustainable energy source. We are very proud of the Bradley plant, and we hope to replicate the success to other locations in our development pipeline.

Today, Fidem Energy has a portfolio of gas rights at ten different locations in Tennessee, Georgia, Alabama, Texas, North Carolina, and Arkansas. We currently have two additional RNG projects in the design and construction phase, with another two in the process of having landfill gas collection and control systems installed. With each new project, Fidem anticipates the creation of 40-60 temporary jobs per project during 2-3 year long construction and development phase. In the long term, Fidem projects would also provide five full-time employees to operate each project. Each of these projects are expected to be located in rural areas. While these numbers may be small – we are in fact a small business – there is so much opportunity for growth in this industry.

Increasing the use of RNG promotes economic growth, enhances our country's energy independence, and decreases the reliance on foreign energy. In fact, given the remaining landfill capacity across the country, RNG from landfill gas could be a domestic energy source for many decades to come.

The U.S. currently has the potential to build over 15,000 new biogas systems, which would create significant economic, environmental and energy benefits. With respect to energy benefit, RNG is produced 24/7/365 with a reliability rate of 95% (compared to average reliability rate for solar power of 25% and 35% for wind power). Biogas also supports a distributed generation of energy, which means lower transmission and transportation costs, as well as reduced impact and higher reliability of electrical grids. With respect to economic benefits, new biogas systems would create new revenue streams in rural America, building resiliency against commodity price fluctuations.

Building out the U.S. biogas infrastructure could generate at least $45 billion in new capital deployment for construction activity, resulting in 375,000 short-term construction jobs and 25,000 permanent jobs. It could produce 33 billion BTU of renewable heat per hour (4.3 million homes), provide fuel for vehicles equivalent to 15.4 billion gallons per year (32 million vehicles), or produce 100 billion kilowatt-hours of electricity per year (9.3 million homes).

At Fidem, we recognize the importance of our country having a healthy domestic energy sector, and we hope the biogas industry can play an increasing role. We support an "all-of-the-above" outlook and agree on the need for our nation to have as many different energy sources as possible. Our country needs to become more energy dominant and secure, and less reliant on foreign energy sources. And, the stronger we can make the domestic energy sector, then we can create more jobs, improve our national security, and better ensure our energy independence.

As this Subcommittee and Committee continues to explore expanding domestic energy production, we hope that you will consider the progress being made with landfill gas. Fidem Energy is happy to be an ongoing resource and to provide additional information about our company and the RNG/landfill gas industry. We look forward to an ongoing dialogue about the ways in which Washington can support our industry and increase the sustainable energy sources in our country.

Thank you again for the opportunity to provide this written statement.

The Colorado Energy Office has been awarded over $500M in funds from the IRA and IIJA (program list below). As of midday 2/4/25 all accounts were still frozen related to these programs.

Name of Grant	**Funder (B7)**	**Notes**	**Federal Funds (B4)**
GRID 40101(d) (IIJA) - 0006 Bipartisan Infrastructure Law (BIL) – PREVENTING OUTAGES AND ENHANCING THE RESILIENCE OF THE ELECTRIC GRID FORMULA GRANTS TO STATES AND INDIAN TRIBES	DOE	Grid resilience, reliability, security	$25,608,964.00
IRA Home Efficiency Rebates 0025	DOE	home energy rebates	$70,256,845.00
SEP Formula - Colorado 0027	DOE	flexible funding for state energy offices	$2,825,230.00
SEP BIL - Colorado	DOE	flexible funding for state energy offices	$6,906,270.00
IRA Electrification Rebates 0081	DOE	home energy rebates	$69,985,890.00
IIJA (BIL): RECI Advancing Building Performance Standards (BPS) in Colorado DE-EE0010936	DOE	commercial building energy	$2,500,000.00
IIJA (BIL): RECI Colorado Advanced Energy Code Adoption and Enforcement Program (Form)	DOE	building energy codes	$2,500,000.00

CPRG - 5600 Colorado Climate Pollution Reduction Planning Grant	EPA	planning funds	$3,000,000.00
WAP Block 9891	DOE	weatherization	$22,687,215.00
WAP IIJA 9976	DOE	weatherization	$50,064,163.00
EERLF 100328	DOE	energy efficiency financing	$1,631,220.00
EECBG BIL 0194	SCEP	small community energy support	$2,075,410.00
TREC 0757	DOE	workforce development	$2,501,170.00
Solar for All 84090401	EPA	low income solar	$156,120,000.00
CPRG Implementation - 2300	EPA	multiple programs	$129,008,738.00
SE0001541 IRA Codes Competitive Award Collaborative solutions	DOE	building energy codes	$20,000,000.00
R STEP	ENERGYWERX	renewable siting technical assistance	$1,960,000.00
Energy Futures Grant ELECTRIC Deployment	DOE	study on low income electrification	$500,000.00
Adopt Build Codes Formula Award 1461	DOE	building energy codes	$12,201,485.50
(National Electric Vehicle Infrastructure/NEVI)	CDOT/DOT	electric vehicle infrastructure	$44,494,590.00

Trump Is About to Wreck U.S. Oil Refineries

The American oil industry wasn't built for Canadian tariffs.

ROBINSON MEYER · 01/30/2025

Heatmap Illustration/Getty Images

Since his re-election, President Trump has repeatedly threatened to impose big tariffs on imports from Canada and Mexico.

And in recent days, he's made it clear: Yes, he really means *all* imports.

"We don't need them to make our cars, we make a lot of them. We don't need their lumber because we have our own forests," he told Davos attendees last week. "We don't need their oil and gas, we have more than anybody."

industry really does depend on oil imported from its neighbors, especially Canada. If Trump makes good on his threats to tariff oil imports from Canada and Mexico, then he will cost the American oil and gas industry tens of billions of dollars while causing gasoline prices to rise across much of the country.

That's because not all petroleum is created equal. The type of crude that oozes out of wells in Alberta and Saskatchewan is not identical to what's extracted by frackers in Texas and Oklahoma. But the types of petroleum now produced in Canada and in America pair especially well together — meaning that if the price of Canadian oil goes up, then American refineries, as well as American consumers, will pay the price.

That could hurt the president's ability to fulfill one of his core promises. In his inaugural address, Trump promised to "rapidly bring down costs and prices" in part by fighting "escalating energy costs." Levying tariffs on Canadian oil imports would likely raise energy prices.

But it could have more complicated environmental effects. Western Canadian petroleum has a higher carbon intensity than other crude oils, and American climate activists fought last decade to keep it from entering the United States. Trump, counterintuitively, could succeed more thoroughly than they did.

A brief digression

We often talk about oil as an homogenous and fungible commodity, but that's not really true. In reality, oil and natural gas usually come out of the ground as a slurry of hydrocarbons.

A hydrocarbon is a chain of hydrogen and carbon atoms bonded together. Sometimes those chains are relatively short — as in methane, the major component of natural gas — and sometimes they're longer — as in octane, a liquid and a major component of gasoline. As the number of carbon atoms keeps growing, the substance starts to get waxier until the chains get absolutely enormous and become the kind of molecule you find in coal. Nitrogen, oxygen, and sulfur atoms are sometimes jammed into the hydrocarbon chains too.

In other words, all fossil fuels exist on a spectrum — and crude oil, a melange of hydrocarbons of different lengths and properties, occupies the messy middle. Those properties can vary based on how and why in the past a crude field formed. Petroleum engineers classify it along two axes:

- Its *weight.* When oil has more short-chain hydrocarbons, it flows more easily, and petroleum engineers talk about it as being "light." When oil has more long-chain hydrocarbons and is more viscous, they say that it's "heavy."
- Its *sulfur content.* Some hydrocarbon chains contain sulfur atoms mixed in with the

Engineers say that sulfur-rich crude is "sour," while sulfur-light crude is "sweet."

American fracking wells tend to produce light, sweet crude. The oil from Alberta is heavy and sour.

Normally, heavy and sour oil trades at a discount compared to light and sweet oil. That's because the highest volume products that come out of a refinery — gasoline or jet fuel, for instance — are made of short hydrocarbons, not long ones. Light, sweet crudes are closer to the finished product, and thus require less refining.

Yet heavy, sour crudes are crucial to the U.S. oil industry anyway. American refiners use heavy crudes to bring down their input costs for refined products such as gasoline, diesel, and jet fuel.

Why? That's where the history comes in.

North America is an integrated energy system

Nearly two decades ago, as oil prices reached painful highs as global demand outstripped supply, many refineries across the United States began to invest in technologies that would let them break down heavier, sour petroleum into something more commercially viable. They built coking refineries, expensive pieces of equipment that use extreme heat to break down long hydrocarbon chains into shorter ones. The cost of such a refinery can exceed $10 billion. Many were purpose-built for breaking down the sludgy, sour oil coming from Canada.

In the early 2010s, as the fracking revolution turned the United States into an oil-drilling superpower, those coking refineries remained important. They helped stretch the value out of the light, tight crude coming out of fracking wells, Rory Johnston, an oil markets analyst and the author of the Commodity Context newsletter, told me last week.

It does not make sense to use the coking refineries on oil from fracking wells, because that oil is already largely composed of short-chain hydrocarbons. But by breaking down Canadian oil in coking refineries, and blending it with American oil, the industry can make a wider blend of producers at a lower cost.

"Heavy crude's cheaper, and they want to refine this into valuable end products," Johnston said in a separate conversation recorded this week on Heatmap's Shift Key podcast. "And so because of

Many of America's refineries — especially those in the Midwest — are now tuned specifically to process light fracking oil and heavy Canadian sludge together, he said. What this means in practice is that the United States exports as a finished product much of the crude oil that it imports from Canada. Under the current situation, the U.S. earns more money selling refined products *made* from Canadian crude than it spends importing raw petroleum from Canada, Johnston added.

Tariffs will collapse the price relationships that allow for that mutually beneficial situation to persist. It will boost the cost of Canadian oil by at least $5 a barrel on each side of the border, raising pump prices by about 13 cents in the Midwest, Johnston told me.

That may not sound so bad for consumers. But it would be terrible for refiners. "The total effect of Trump's actions so far is to nuke the economics of U.S. coking refineries. It's truly magnificent," he said. "You couldn't create a better scenario to destroy the economics of U.S. coking refineries."

If U.S. oil companies lose access to cheap Canadian oil, they will struggle to replace it. That's because the next best place to get heavy, sour crude is Mexico — and Mexican imports, too, would likely face 25% tariffs under most scenarios where Canada is levied. The next places to get heavy, sour crude are Venezuela (where the Trump administration wants to tighten sanctions) and Colombia (where Trump nearly imposed tariffs last weekend).

millions of barrels of oil from Canada down to the U.S. Gulf Coast every day. The countries — and especially their fossil fuel industries — are interdependent.

Meanwhile, only one pipeline system — the Trans Mountain pipeline — connects Alberta's oil fields to the Pacific coast.

If you begin to play out how each country might react to a tariff, Johnston said, "you get into these completely absurd scenario discussions," Johnston said. "The result is everyone would be poorer in that scenario."

None other than the U.S. oil industry itself has opposed the tariffs.

"We import a lot of oil from both Mexico and Canada, and we refine it here in the most sophisticated refinery system in the world," Mike Sommers, the CEO of the American Petroleum Institute, said at an event in Washington last week. "We're going to continue to work with the Trump administration on this so that they understand how important it is that we continue these trade relationships."

On Monday, *The Wall Street Journal* reported that some Trump aides are eager to hit Canada and Mexico with tariffs this weekend, even though the president has yet to reopen talks — or even

One irony of this fracas is that the tariffs would have a more uncertain environmental effect. Western Canadian crude is unusually carbon-intensive to extract and refine. If its price rose — or if Canadian officials responded to tariffs in part by shutting down production — then Trump could accidentally, if marginally, decrease carbon emissions. American refineries might also respond to tariffs by importing heavy, sour crude oil from abroad, essentially just shifting production around the planet.

Still, it remains ridiculous that Trump, who has spent his first days in the White House attacking a "Green New Deal" agenda that never actually passed Congress, might succeed in raising the cost of oil consumption and production in the U.S. where a decade of climate activism has largely failed.

Perhaps that's why many still doubt it would happen. On Wednesday morning, President Claudia Sheinbaum of Mexico said that she did not think Trump would ultimately impose sanctions on her country. And even within the oil industry, tariffs on Canadian oil seem unthinkable. A 25% tariff would whack the industry hardest, even though it has allied itself closely with Trump. Trump's likely energy secretary, Chris Wright, is the CEO of Liberty Energy, an oilfield services company.

"A lot of the people I'm hearing on the Canadian side are saying, 'Maybe we should try to speak with these people around Trump. Maybe Wright or [Trump's energy czar Doug] Burgum understand what's happening,'" Johnston said.

But Trump has already made demands that strike the North American oil industry as bizarre. At the same Davos meeting where he said the United States didn't need Canadian oil, Trump demanded that OPEC and Saudi Arabia cut global oil prices so that global interest rates could fall. Such a move would cut profits in the American oil industry while hampering Trump's goal of increasing U.S. oil production.

The irony that a Republican president would push off Canadian crude to increase America's reliance on OPEC is hard to comprehend, Johnston said.

“I don’t know that anyone has a great sense of where Trump’s true philosophical anchor is,” he said, “other than that we are now getting a clear picture that he views any and all trade deficits as a sin unto themselves.”

ROBINSON MEYER

Robinson is the founding executive editor of Heatmap. He was previously a staff writer at The Atlantic, where he covered climate change, energy, and technology.

The Honorable Mike Crapo
239 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Jason Smith
1011 Longworth House Office Building
Washington, DC 20515

The Honorable Ron Wyden
221 Dirksen Senate Office Building
Washington, DC 20510

The Honorable Richard Neal
372 Cannon House Office Building
Washington, DC 20515

January 7, 2025

Dear Chairman Crapo, Ranking Member Wyden, Chairman Smith and Ranking Member Neal:

On behalf of the undersigned trade associations representing millions of American workers across the domestic energy sector, we urge you to prioritize energy security, reliability and affordability as your committees consider potential legislation to reform the tax code. An all-of-the-above tax code is necessary to support an all-of-the-above electricity grid that can meet rising demand, ensure a reliable, resilient grid, and increasingly clean grid, and maintain affordability for American families.

America's energy sector is the backbone of our economy and national security. As global events continue to demonstrate the strategic importance of domestic energy production, federal tax policy should support a robust, diverse energy portfolio that includes both traditional and renewable sources available to all market participants.

The coming decades will see unprecedented growth in electricity demand driven by economic expansion including the build-out of data centers and the continued onshoring of manufacturing. Data sourced from S&P Global forecasts a 20-percent increase by 2030 alone, and we cannot supply this demand without increasing domestic energy production. Meeting this challenge while maintaining energy affordability and reliability will require maximizing every domestic energy source available. Tax policy that supports investment across the full spectrum of energy resources is essential to achieve these goals.

Our member companies are creating millions of new good-paying American jobs. Investing in domestic energy production, energy infrastructure, and manufacturing will support continued job growth and economic development in communities across the country while reducing costs for American families and businesses. The existing suite of energy tax credits, and the investment they are driving, has led to a reduction of both wholesale power and capacity prices delivering an 11-percent reduction in power system costs and saving consumers money on their electric bill.

As your committees evaluate energy tax policy, we stand ready to serve as a resource and share our industry's expertise. We ask that you take a balanced approach to tax reform that maintains tax incentives for all forms of domestic energy production and storage, to best serve American consumers, workers, and our national security interests.

Thank you for your consideration of these important issues.

American Clean Power Association
American Public Power Association
Carbon Utilization Research Council
Edison Electric Institute
National Electrical Manufacturers Association
National Hydropower Association
National Rural Electric Cooperative Association
Nuclear Energy Institute

AURORA
ENERGY RESEARCH

Impact of reform to clean energy tax credits on investment, jobs and consumer bills

Public report | January 6, 2025

This independent report analyses the potential impact of reform to clean energy tax credits on investment, jobs, and consumer bills

AURORA

- The Inflation Reduction Act of 2022 (IRA) extended and expanded the Clean Energy Tax Incentives available to businesses, in particular 48E, the technology-neutral Investment Tax Credit (ITC) and 45Y, the technology-neutral Production Tax Credit (PTC)
- This report quantifies the impacts of removing the ITC and PTC available for utility-scale onshore and offshore wind, solar PV and battery storage on investment, generation capacity, job creation, and wholesale and retail power prices between 2025 and 2040 across competitive power markets in the United States: ERCOT, CAISO, PJM, MISO, NYISO, ISO-NE and SPP.
- The analysis in this report is based on Aurora's modeling of two distinct scenarios: the base case, where tax credits are continued, and the Tax Credit Removal scenario where the ITC and PTC are removed for wind, solar and battery deployment. See more details in the Appendix.

Study limitations

- All analysis in this report address dynamics within the seven competitive wholesale electricity markets—representing around two-thirds of total US power consumption – and excludes regulated regions such as the WECC[1] and the SERC[2] in western and southeastern states.
- Results are likely to be a conservative estimate of the impact on investment, jobs, and clean tech deployment. The study focuses only on wind, solar and storage ITC/PTCs. Other clean energy policies (e.g. support for electric vehicles, hydrogen, CCS), behind-the-meter projects, and the potential impact on other sectors like manufacturing were not considered as part of the project scope.

About Aurora Energy Research

- Aurora Energy Research is a leading global provider of independent power-market forecasts and analytics for critical investment and financing decisions.
- This report is fully independent, technology-agnostic, and does not advocate for any specific policy or regulation.

1) Western Electricity Coordinating Council. 2) Southeastern Electric Reliability Council.

Executive Summary

1 **Across US competitive electricity markets[1], the removal of tax credits for wind, solar, and battery deployments could result in at least $336bn less investment and 237GW less clean energy deployed over the next 15 years – all amid rapidly growing electricity demand.**

- Rapid electricity demand growth data centers and electrification across the US is driving a need for new generation capacity. Clean energy deployment averaged 25GW per year for the last five years.
- On an absolute basis, New York and Texas are the states that see the largest decline in clean energy investment—losing $4.4bn/year and $3.3bn/year on average through 2040, respectively.
- In relative terms, the removal of tax credits impacts investment in the Great Plains and Midwest most acutely, where total foregone clean energy investment exceeds 3% of 2023 state GDP.

2 **Decreased capacity would result in 97,000 net fewer American jobs created in construction, maintenance, and operations of power generation facilities.**

- Utility-scale renewables employed over 150,000 people across the United States in 2023. The clean energy job sector grew 4.2% from 2022 to 2023.
- Elimination of tax credits costs at least 103,000 full-time jobs across clean energy generation technologies. This is only partially offset by an increase in 6,000 fossil fuel jobs, resulting in a net loss of 97,000 energy jobs.
- These estimates are likely conservative since they do not capture indirect impacts (e.g. resulting from higher power prices) or the impact on regulated regions covering a third of the country's electricity demand.

3 **Removal of tax credits increases residential electricity bills by 10% on average, and up to 22% in certain states by 2040.**

- On average, annual power bills increase $142/year for consumers by 2040.
- Bills are expected to rise most sharply in states where average residential power prices are already high, like New York ($39/month increase) and Minnesota ($22/month increase), but also in states where residential energy demand is highest, such as Texas ($29/month increase) and Louisiana ($21/month increase).

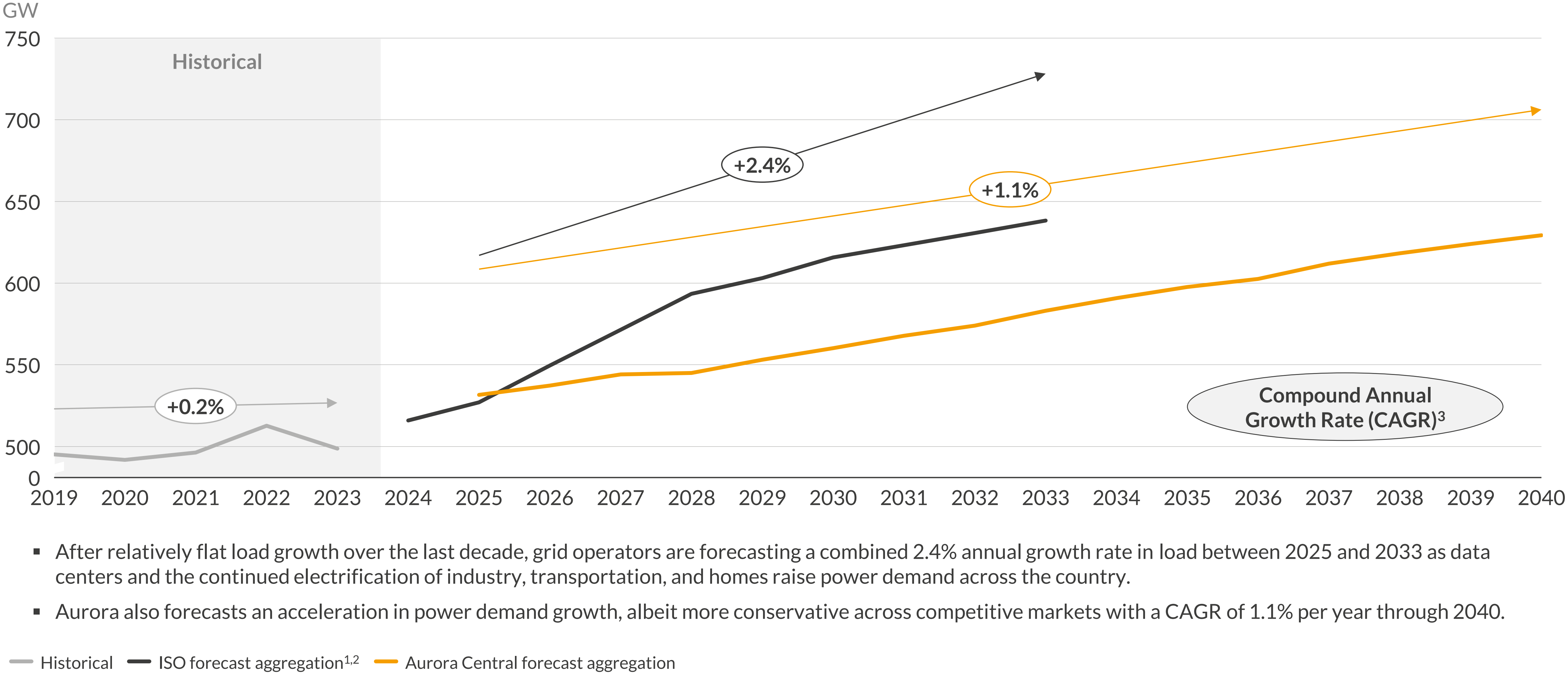
1) CAISO, ERCOT, ISO-NE, MISO, PJM, NYISO, SPP.

Sources: Aurora Energy Research, ERCOT

Accelerating power demand growth from electrification and data centers is driving the need for new generation capacity across the United States

AURORA

Historical and forecasted peak load, aggregated across the seven competitive Independent System Operators (ISO)[1,2]



- After relatively flat load growth over the last decade, grid operators are forecasting a combined 2.4% annual growth rate in load between 2025 and 2033 as data centers and the continued electrification of industry, transportation, and homes raise power demand across the country.
- Aurora also forecasts an acceleration in power demand growth, albeit more conservative across competitive markets with a CAGR of 1.1% per year through 2040.

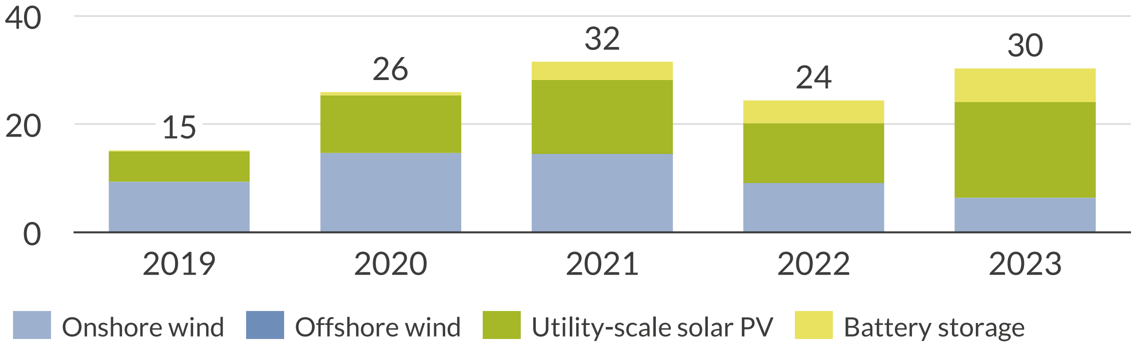
1) CAISO, ERCOT, ISO-NE, MISO, PJM, NYISO, SPP. For more details on ISOs, see appendix. 2) SPP short-term load forecast is available through 2029; values are extrapolated linearly through 2033 here to match data availability from other ISOs. 3) Annualized average rate of growth.

Sources: Aurora Energy Research, historic data and ISO forecasts come from respective ISOs

In the last five years, 127GW of clean energy has been deployed across the US, bringing with it new jobs and contributing to stable electricity prices

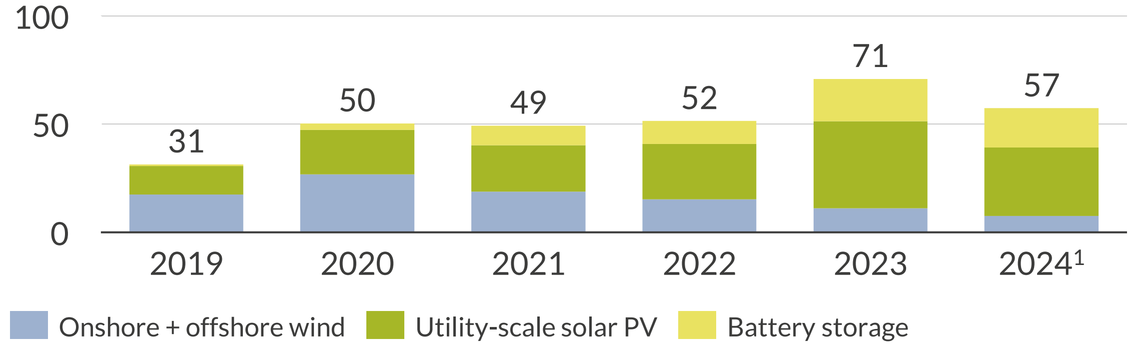
1 **127GW of utility-scale wind, solar, and battery storage have been deployed since 2019 across the US, aided by federal tax credits**

Annual US-wide clean energy deployment by technology
GW



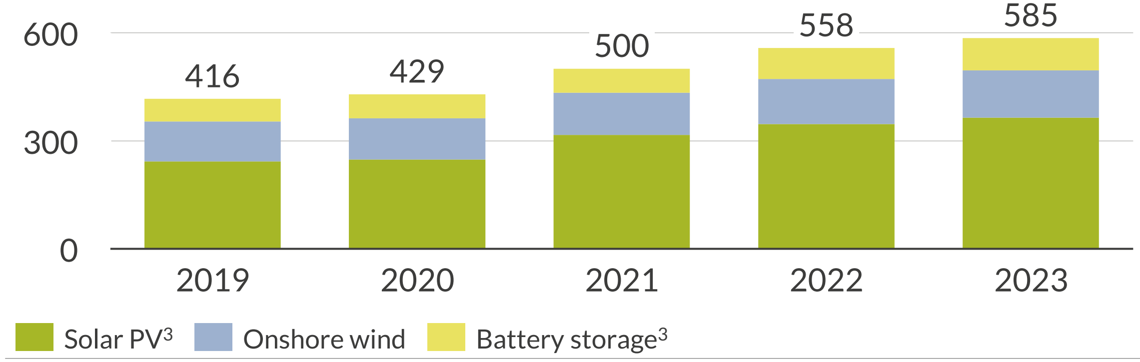
2 **Over $300bn in public and private investments have been made in wind, solar, and storage deployments since 2019**

Actual clean energy investment by technology[4]
$ billion (2023 real)



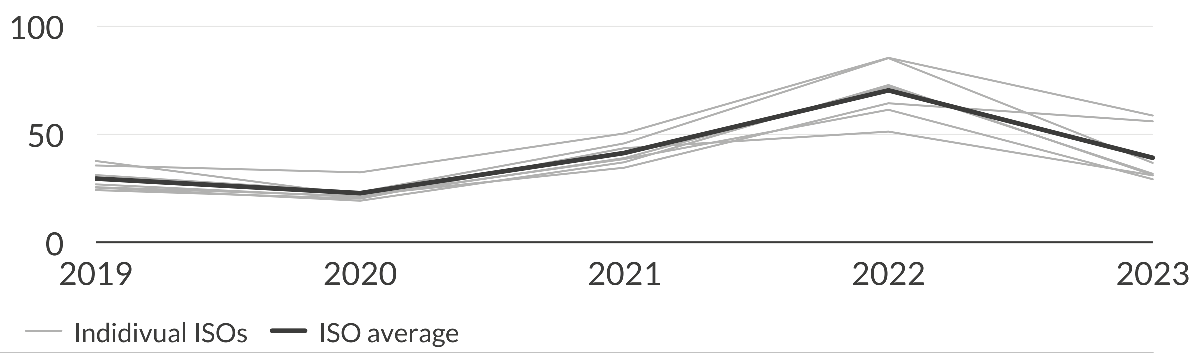
3 **Clean energy jobs have grown in line with investment, growing to 54% of total electric power jobs in 2024**

Full-time jobs by technology[4]
Thousands of jobs



4 **Electricity prices have remained relatively flat over the past five years, due in part to rapid renewables penetration and limited load growth**

Day-ahead wholesale electricity prices by ISO[2]
$/MWh (nominal)



1) 2024 data through end of Q3. 2) To increase readability, this graph excludes February 2021 prices in ERCOT, when Winter Storm Uri skyrocketed average day-ahead wholesale prices to $1,483/MWh. Including February, average 2021 day-ahead wholesale price in ERCOT was $155/MWh. 3) Includes both utility-scale and residential / behind-the-meter capacity. 4) These numbers do not include the investment or jobs in manufacturing for these technologies.

Sources: Aurora Energy Research, Rhodium, EIA, individual ISOs, US Department of Energy

In this study, Aurora modelled the seven competitive power markets in the US to explore the impact of tax credit removal on generators and consumers

AURORA

Aurora base case assumptions and Tax Credit Removal scenario methodology

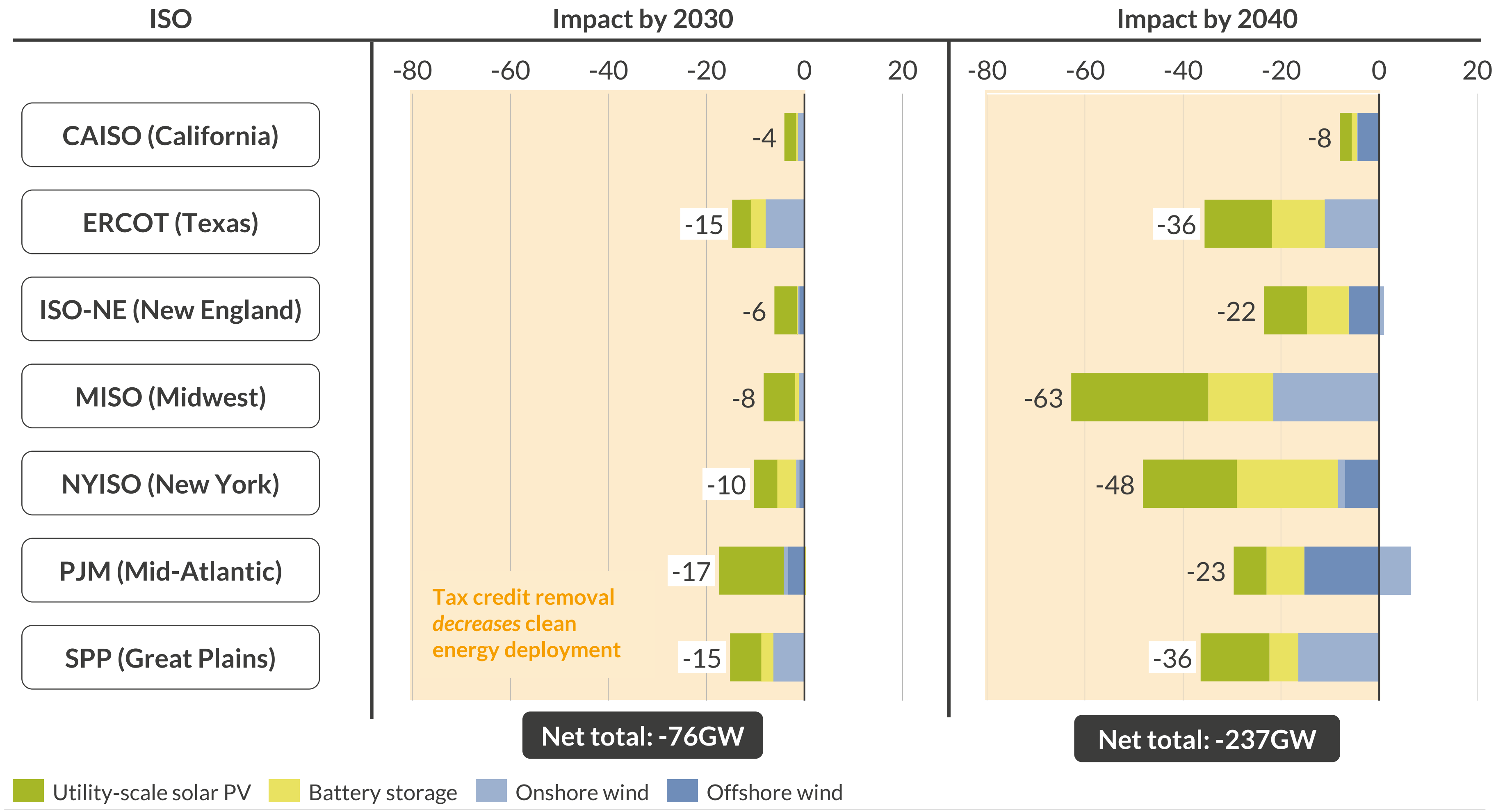
Key assumption	Aurora Base Case	Tax Credit Removal scenario
Capacity build	▪ Aurora's production cost and capacity expansion modelling yields detailed forecasts for plant-level economic build and retirements out to 2060 across competitive wholesale markets, with all assets meeting a target rate-of-return.	▪ Tax credit removal impacts project economics.
Investment	▪ Calculated based on project CAPEX for new build assets.	▪ Impact of capacity build across competitive markets is translated into investment impact in all states building solar PV, onshore and offshore wind, or BESS.
Jobs	▪ Data from industry publications[1] and academic research are used to estimate job creation per MW of installed capacity by technology.	▪ Capacity changes relative to the base case are translated into increases and decreases in jobs by technology.
Electricity prices	▪ Hourly wholesale prices are modelled out to 2060 across competitive electricity markets (Independent System Operators – ISOs) internally consistent with capacity build.	▪ Historical data from EIA are used to correlate wholesale and residential electricity prices from 2014-2023. This correlation is applied to Aurora's forecasted wholesale prices to project retail rate impacts by state. For a view on wholesale electricity prices in states covered by multiple ISOs, we take a load distribution as proxy.
Load growth	▪ Aurora takes a comprehensive view on load growth across the modelled ISOs, considering population growth, electrification (of transportation, heating, oil and gas operations, etc.), and data center expansion.	▪ No changes to load assumptions in the Tax Credit Removal scenario.
Tax credits	▪ Aurora assumes all clean energy projects achieve base PTC and ITC rates; Energy Community adder depends on project location. Credit stepdown in the mid 2030s reflects policy uncertainty. *See appendix slide for more details.*	▪ PTCs and ITCs for wind, solar, and batteries are discontinued in 2025; safe harbor assumptions means projects under construction today can still receive tax credits, but no projects beyond this time frame receive tax credits. *See appendix slide for more details.*

1) Including the DoE's US Energy Employment and Jobs Report.

Sources: Aurora Energy Research, EIA, US Department of Energy

A rollback of federal tax credits could reduce clean energy deployment 76GW by 2030 and 237GW by 2040

Cumulative capacity delta to base case resulting from tax credit removal by ISO (Independent System Operator)
GW



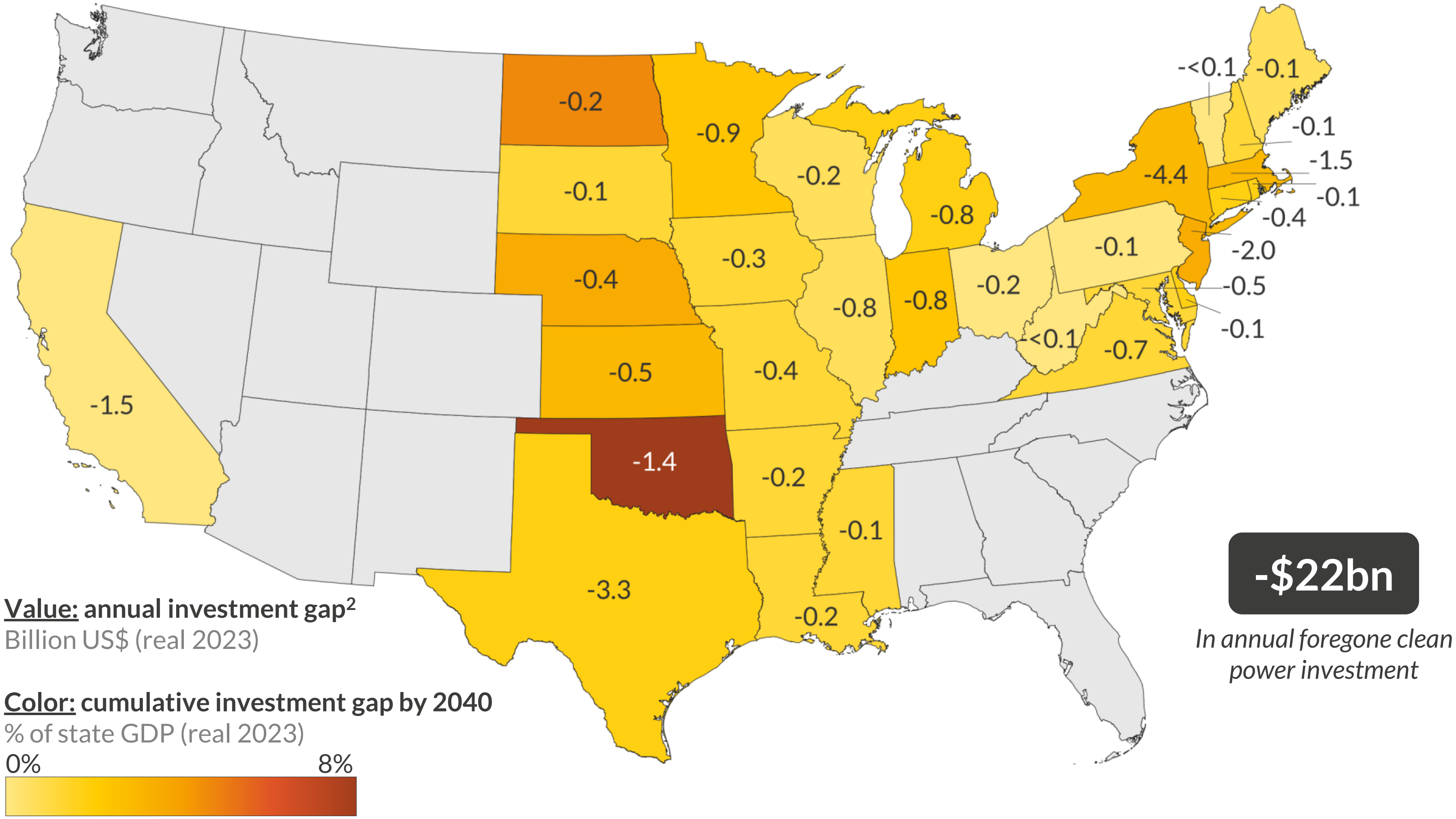
- Across competitive electricity markets in the United States, 76GW less clean energy projects are deployed by 2030 in a world without tax credits supporting the deployment of solar PV, wind, and battery storage technologies, and 237GW by 2040. Compared to the 256GW of capacity operational in 2023, this is a substantial reduction in future growth.
- Utility-scale solar PV is most impacted by the discontinuation of tax credits, seeing 41GW less buildout by 2030 and 93GW less by 2040.
- Offshore wind capacity is reduced 33GW by 2040; this affects coastal regions, where state support for offshore wind deployment is insufficient to make up for loss of federal support.

Sources: Aurora Energy Research

Removal of tax credits could lead to a loss of $22bn/year in clean power investment

AURORA

Investment gap for clean power deployment[1], Tax Credit Removal scenario relative to base case



Value: annual investment gap[2]
Billion US$ (real 2023)

Color: cumulative investment gap by 2040
% of state GDP (real 2023)
0% 8%

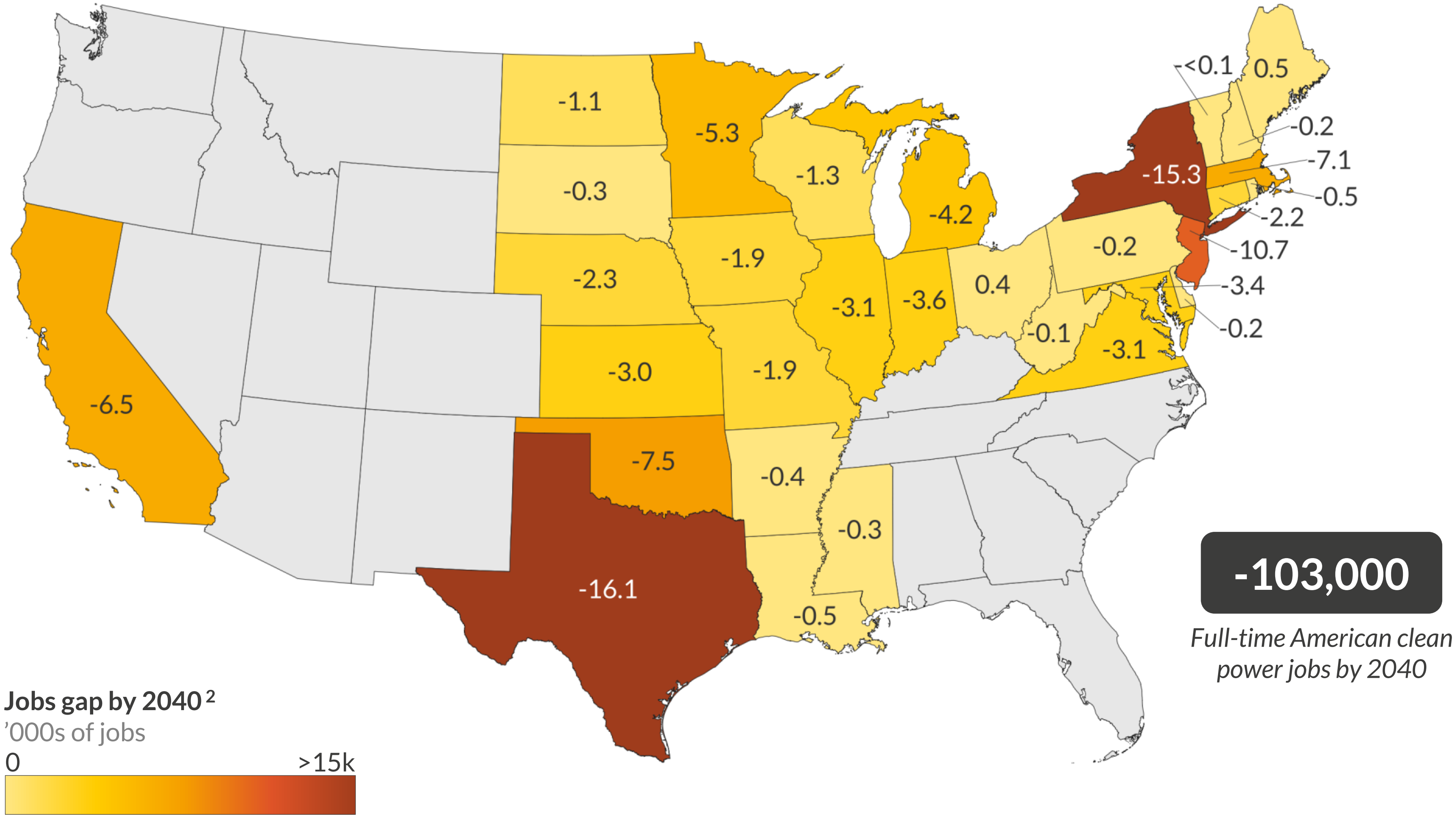
- ISO-wide investment in battery storage, solar, and wind projects totalled $57 billion in Q1-Q3 of 2024.
- Texas saw $24.8 billion, or 1% of state GDP, invested in the last 4 quarters alone. Tax credit removal would cut investment by twice that amount by 2040.
- New York and Texas alone would lose out on $116bn in investment, or 34% of the total.
- Cumulative investment lost in the Great Plains states is between 3 and 5% of 2023 GDP, and as much as 8% in Oklahoma.
- These numbers do not include the impact on investment in manufacturing of wind, solar and battery technologies.

1) Analysis available for deregulated wholesale markets covering 31 states and the District of Columbia. Includes impact to deployment of utility-scale wind, solar, and battery storage systems; excludes impact to manufacturing sector. 2) Delta with Aurora baseline forecast for 2025-2040.
Sources: Aurora Energy Research, Rhodium Group-MIT/CEEPR Clean Investment Monitor

Elimination of tax credits for wind, solar, and battery deployment puts at risk 31,000 jobs by 2030 and at least 103,000 jobs by 2040

AURORA

Jobs gap for clean power deployment by 2040[1,2]



-103,000

Full-time American clean power jobs by 2040

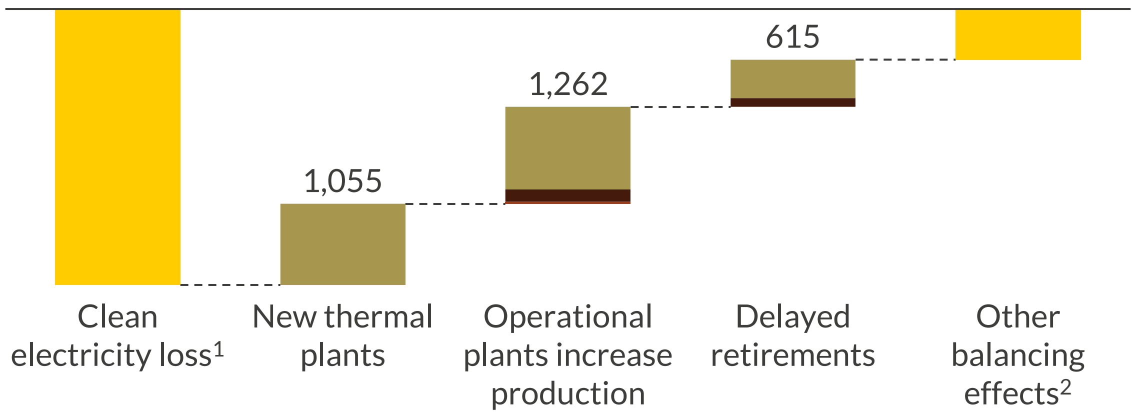
- Utility-scale wind, solar, and battery technologies employed over 150,000 people across construction, maintenance and operation, and professional services in 2023.
- Jobs in clean energy grew 4.2% from 2022 to 2023, more than double the speed of the overall economy at 2.0%.
- Cutting tax credits would be equivalent to 3+ years of lost jobs growth in American clean energy deployment and maintenance.
- These numbers do not include the impact on jobs in manufacturing of wind, solar and battery technologies.

1) Analysis available for deregulated wholesale markets covering 31 states and the District of Columbia. Includes impacts on construction and operation of utility-scale wind, solar, and battery storage systems; excludes impacts on manufacturing sector. 2) Delta with Aurora baseline forecast for 2040, assuming constant relationship between new capacity and job creation.
Sources: Aurora Energy Research, US Department of Energy, IWEC, GWEC, Aldieri et al. (2020)

Job losses are partially offset by a 6,000 increase in the fossil fuel sector, though not enough to make up for the 103,000 clean energy jobs lost

AURORA

Electricity production comparing Tax Credit Removal scenario to base case (2025-2040), TWh

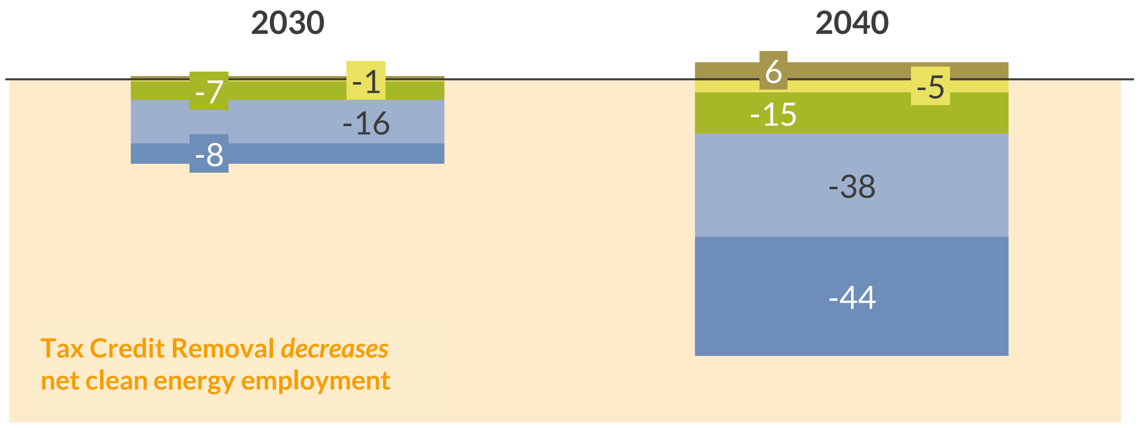


Fossil fuel job impact	4,000 new jobs	No impact	2,000 jobs retained

- The loss in clean electricity generation from the discontinuation of tax credits means that demand must be met in other ways, primarily through fossil-fuel fired generation such as natural gas and coal.
- Most demand is made up through more production from existing plants (35%), meaning these plants are running for longer hours and/or at higher output levels. Some projects that retired in the base case scenario see longer lifetimes in Tax Credit Removal scenario because of more favorable economics due to clean energy decline (making up 17% of lost generation), and the rest is made up for by new build thermal plants (29%).

Gas, Coal, Nuclear

Job impact by technology in Tax Credit Removal scenario relative to base case
Thousands of jobs



Net energy job impact	-30,000 lost jobs	-97,000 lost jobs

- The increase in fossil-fueled fired generation lends to more jobs, though not enough to make up for the loss of clean energy jobs.
- Higher load factors from operational plants results in minimal new jobs, construction of new thermal plants altogether create four thousand new jobs.

Battery, Onshore wind, Gas-fired generation, Solar, Offshore wind, Coal-fired generation

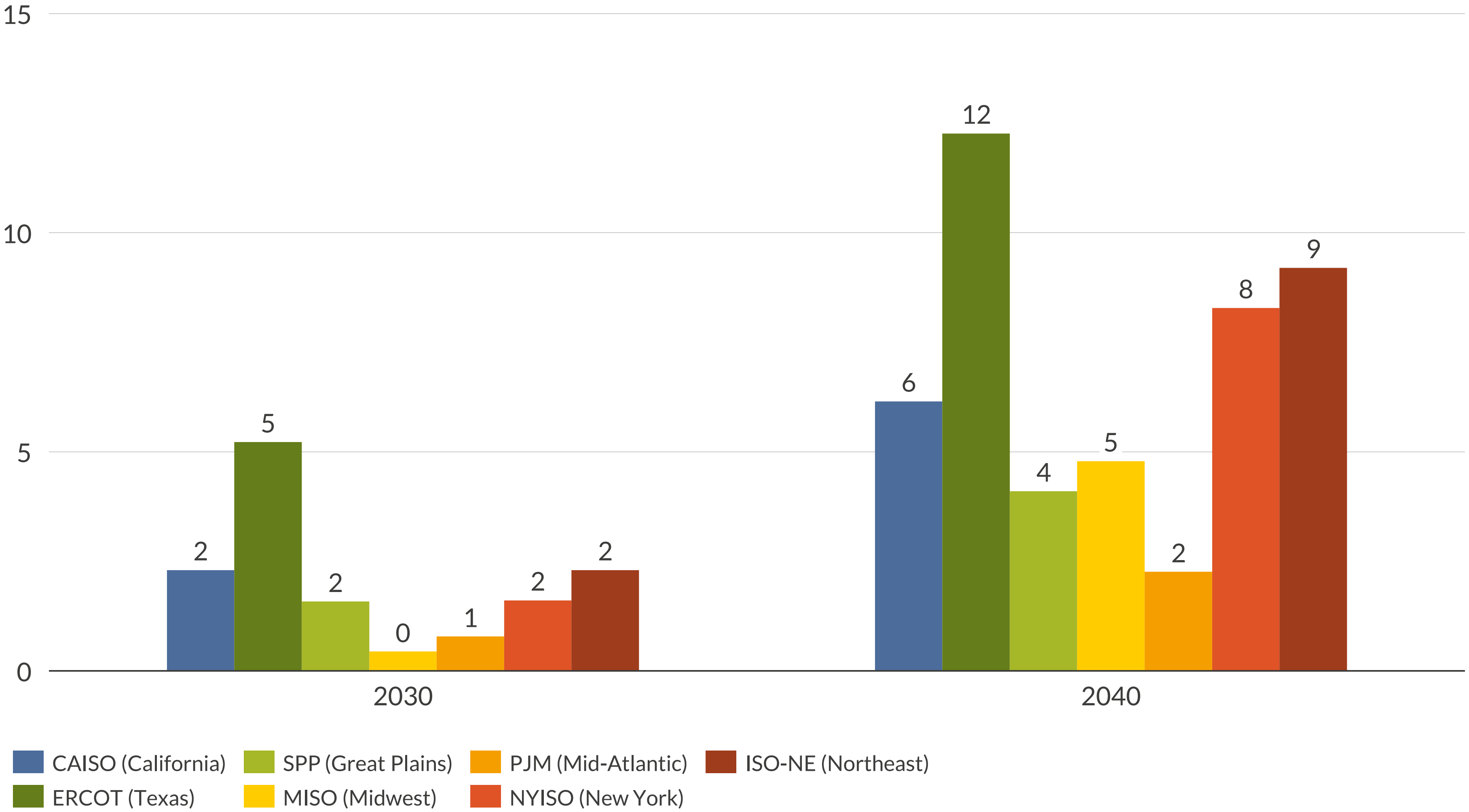
1) The reduction in onshore wind, offshore wind, and solar PV generation in the Tax Credit Removal scenario relative to base case. 2) Other balancing effects include increased generation from dispatchable non-gas, coal, or nuclear plants (e.g. hydro), reduced battery storage losses from less battery storage on the system, reduced demand from price-responsive demand technologies (such as Bitcoin mines in ERCOT).

Sources: Aurora Energy Research, EIA

Removal of tax credits leads to higher wholesale power prices across markets

AURORA

Around the Clock (ATC) price deltas by US ISO, Tax Credit Removal scenario relative to base case
$/MWh (2023 real)



- The elimination of tax credits for renewables and storage deployment results in wholesale power prices rising across every competitive market throughout the next two decades.
- ERCOT (ISO covering the majority of Texas) is disproportionately impacted by tax credit removal. Given high load growth in the state and a lack of state policies supporting clean energy deployment the state loses a lot of cheap electricity generation, raising wholesale electricity prices by \$5/MWh by 2030 and \$12/MWh by 2040.
- Wholesale power prices rise much faster through the 2030s due to lower investment in renewable energy in a world without clean energy tax credits.

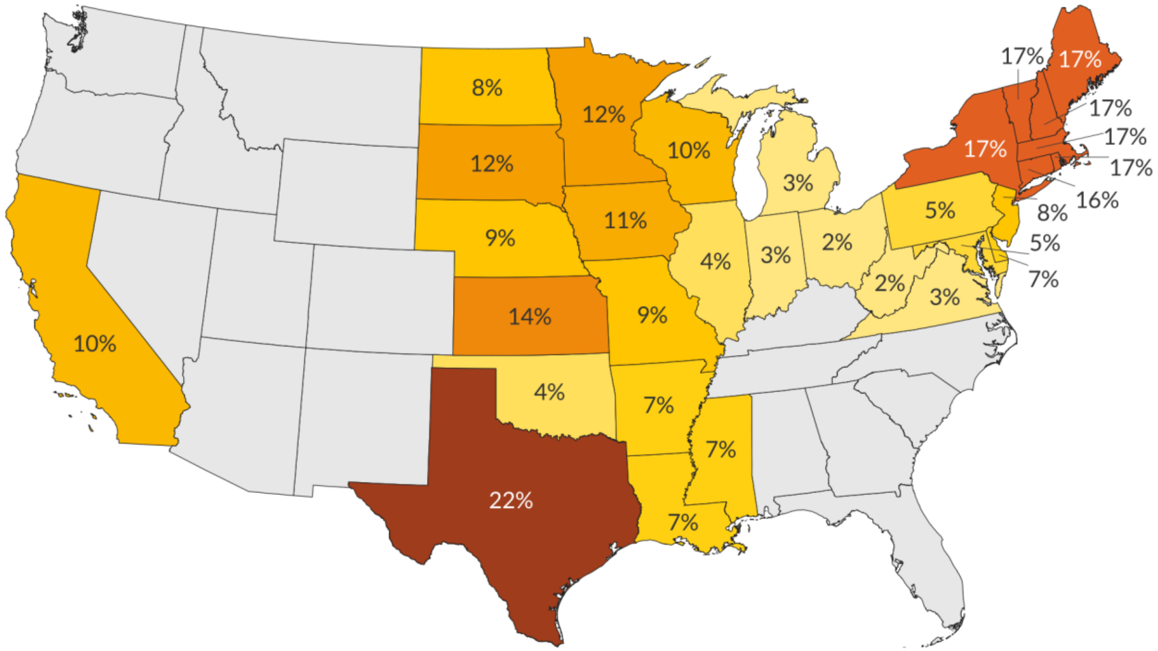
Sources: Aurora Energy Research

By 2040, removal of tax credits could raise retail rates by ~10% and yearly energy bills by ~$142 on average

AURORA

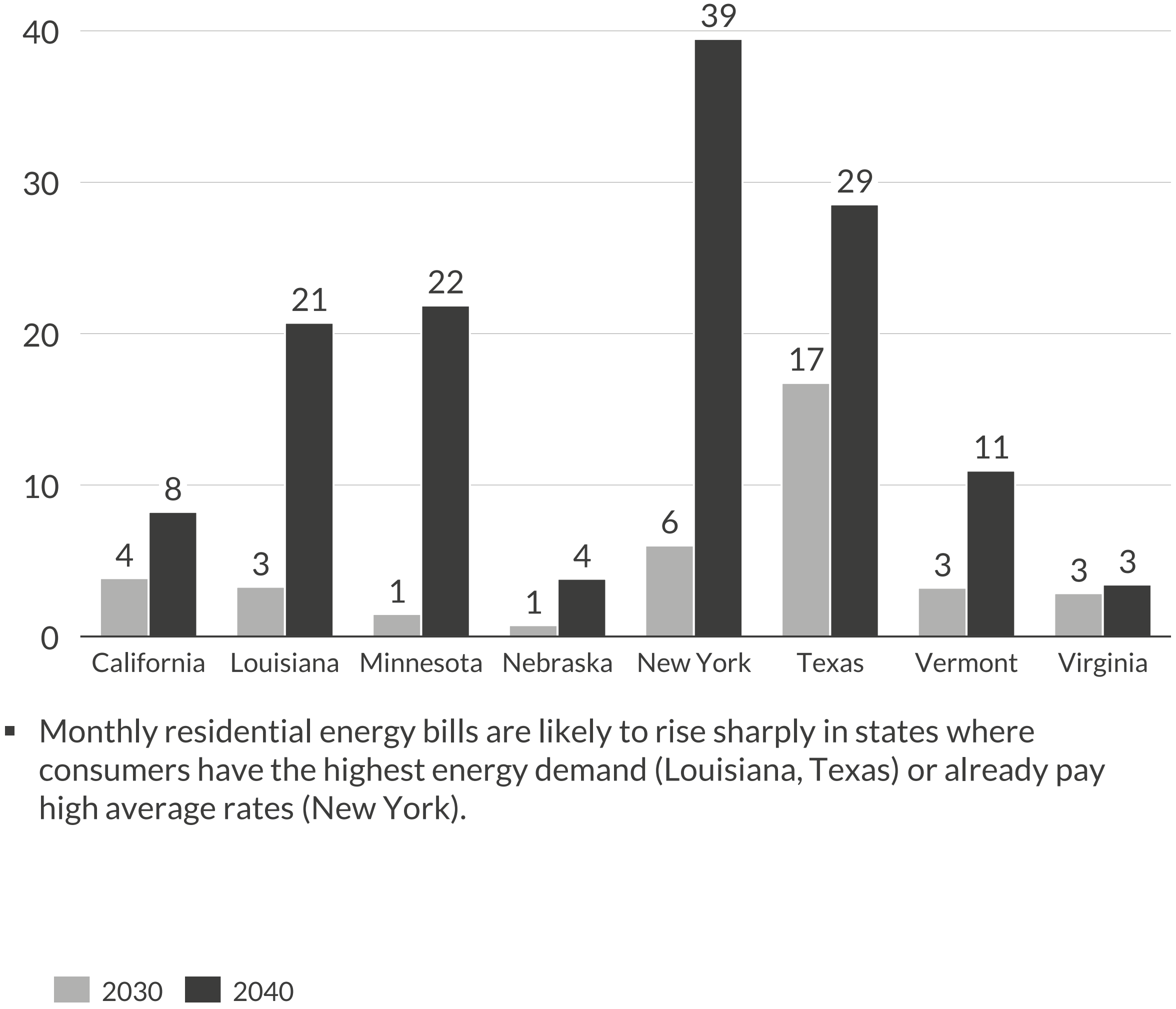
Retail rate increases by state, 2040[1,2]

% delta from base case



Monthly residential energy bill increases by selected state[2,3]

$ over base case (2023 real)



- Without tax credits to incentivize renewable energy development, average retail electricity rates are expected to be 3% higher in 2030, rising to 10% higher on average by 2040.[1,2]
- Removing 169GW of low marginal cost wind and solar generation from the system by 2040 leads to higher power prices rise as more expensive generation must be used to meet demand.

- Monthly residential energy bills are likely to rise sharply in states where consumers have the highest energy demand (Louisiana, Texas) or already pay high average rates (New York).

1) Compared to estimated retail prices in 2040 from a baseline scenario with investment and production tax credits. In this scenario, renewable energy generation is typically replaced with gas and peaking generation, which has a higher short run marginal cost.
2) Analysis available for deregulated wholesale markets covering 31 states and the District of Columbia. No data available for states in gray. 3) Forecasted retail rate multiplied by state-specific 2023 average monthly residential demand

Sources: Aurora Energy Research, EIA

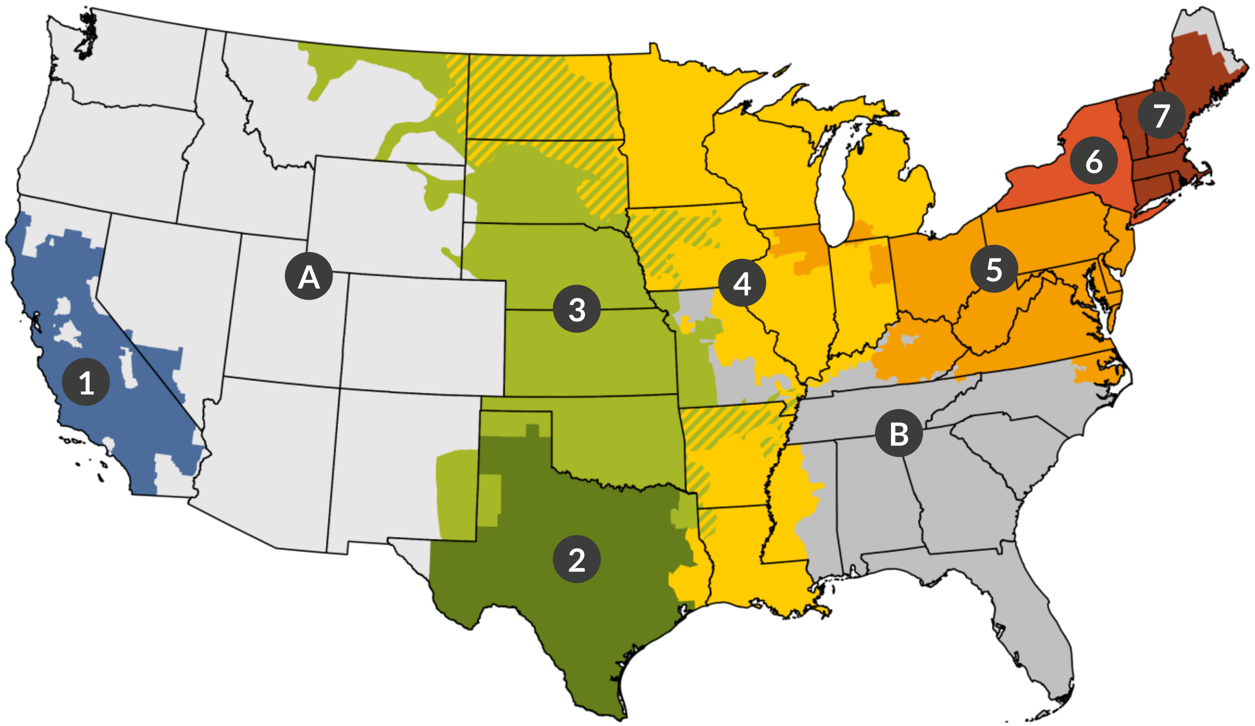
Agenda

AURORA

Aurora models all seven competitive electricity markets in the United States

Two thirds of overall electricity demand in the lower 48 states is served by Independent System Operators (ISOs). ISOs use competitive market mechanisms that allow independent power producers and non-utility generators to trade power. The WECC and SERC regions remain vertically integrated by utility or balancing authority (BA).

Map of US wholesale electricity markets[1]



ISO	Installed capacity,[2] GW	Annual load,[3] TWh	Projected peak load growth[4]	Renewables penetration[3]
CAISO 1	82	220	9.7%	42%
ERCOT 2	140	447	9.2%	41%
SPP 3	100	284	9.9%	40%
MISO 4	200	656	6.0%	20%
PJM 5	219	770	3.7%	10%
NYISO 6	44	147	17.0%	24%
ISO-NE 7	38	110	11.4%	18%

Non-ISO	
WECC A	*Out of scope for this study*
SERC B	

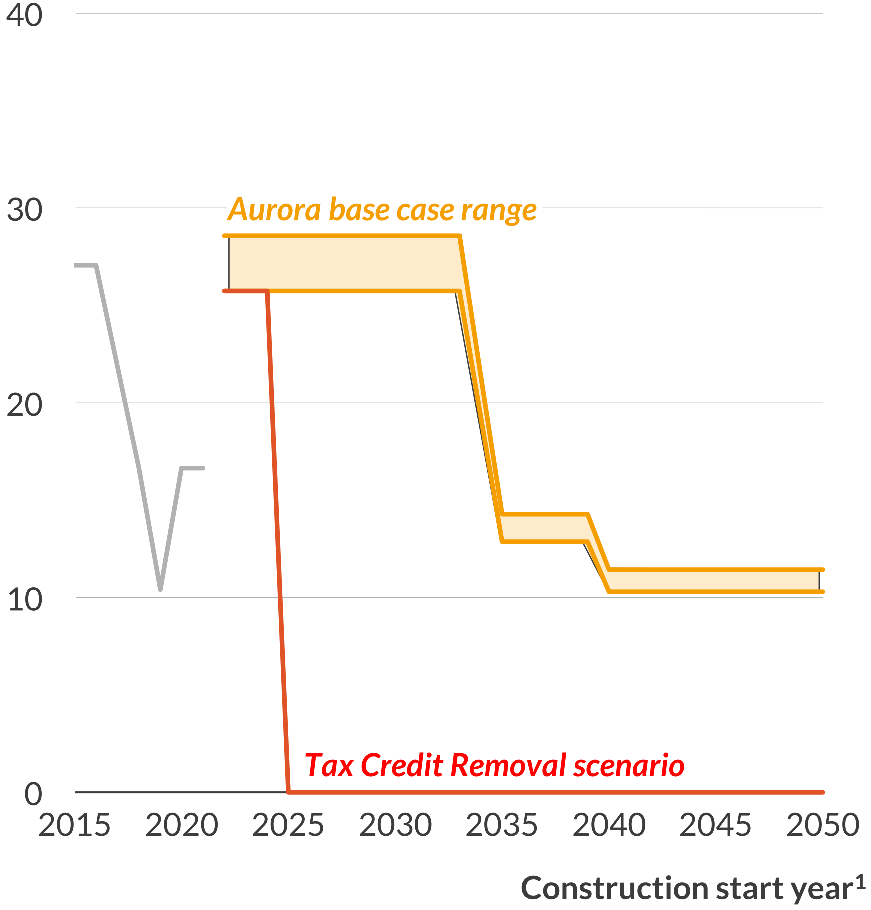
1) Gray areas are regulated, meaning they are vertically integrated utilities responsible for the production, transportation, and sale of electricity to consumers. 2) Data from December 2023 EIA 860m and ERCOT CDR. Includes capacities of plants not bidding fully into wholesale or capacity market. 3) 2023 data. 4) Compares 2024 through 2030. SPP data from individual ISO market report.

Sources: Aurora Energy Research, FERC, NERC, individual ISOs

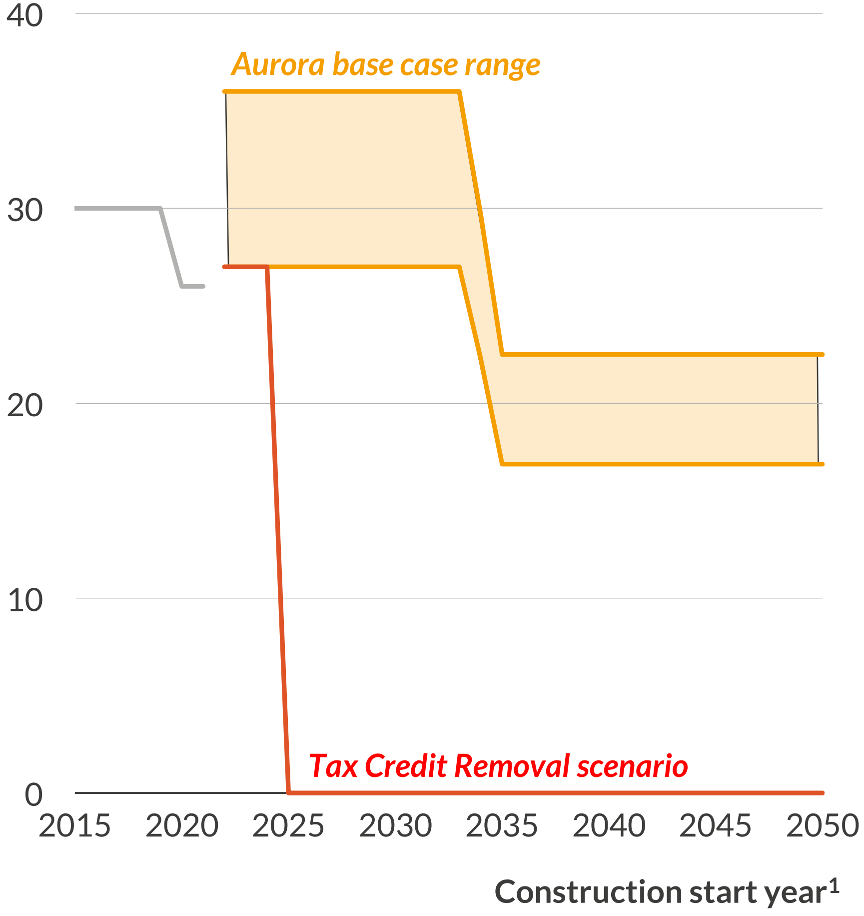
Aurora assumes a minimum $25.7/MWh PTC and 27% ITC; the Tax Credit Removal scenario eliminates these values in 2025

AURORA

PTC value (post transaction cost)
$/MWh (real 2023)



ITC value (post transaction cost)
% capital expenditure



Historic values — Aurora base case tax credit value, upper and lower bound — Tax Credit Removal scenario

1) Legacy project rules enable a 4 year construction time for projects. 2) Excludes transaction costs.

Sources: Aurora Energy Research, EPA

- The Aurora base case assumes all economically-built projects meet labor requirements; some projects realize the Energy Community adder depending on location. No projects in the base case achieve the Domestic Content adder.
- ITC adders are relatively more attractive than PTC adders: ITC adders are 10p.p. additions to the base rate + wage requirement values, whereas PTC adders are a 10% addition of the base rate + wage requirement values.
- Values step down in the base case in the 2030s to reflect some level of policy uncertainty.
- All PTC and ITC value is subject to a 10% haircut per Aurora's assumptions, reflecting some value lost to tax credit transactions.

Agenda

AURORA

I. Additional context

II. Additional results

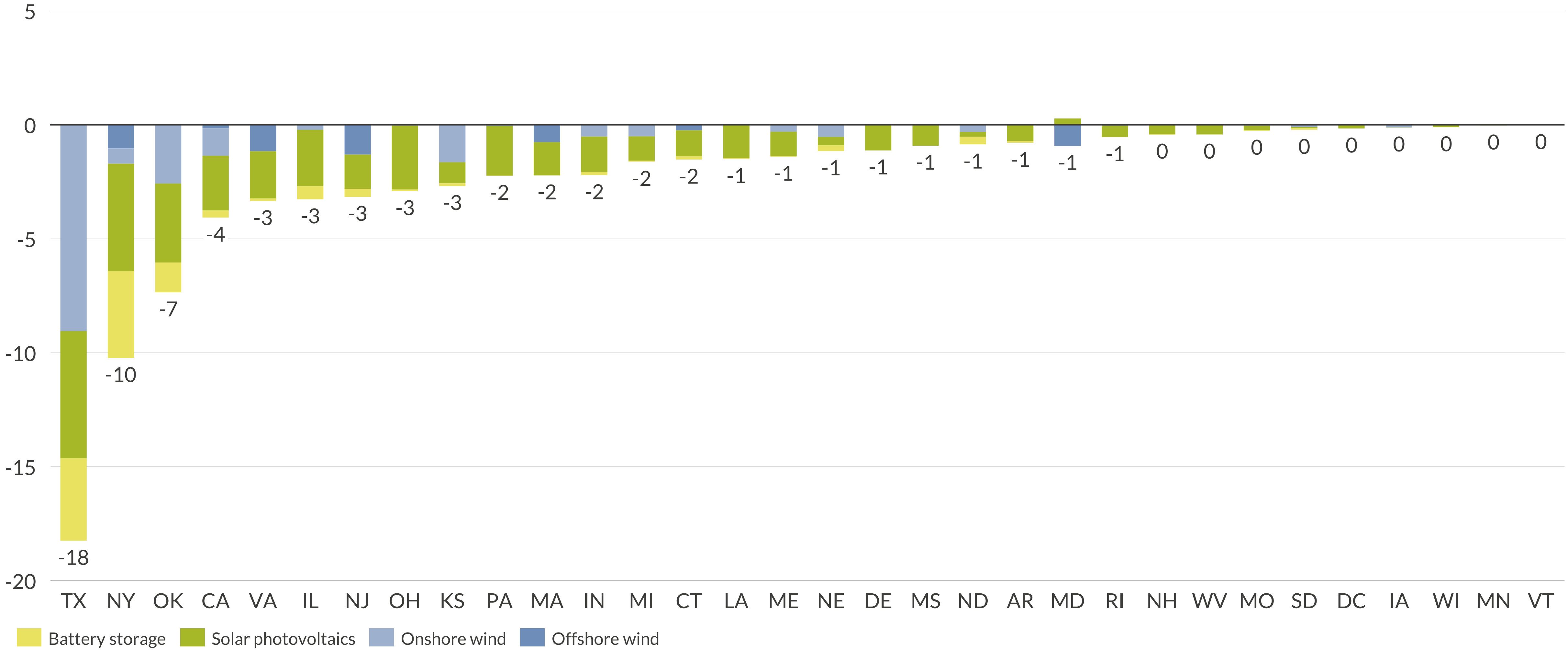
III. About Aurora

Capacity delta by state, 2030

AURORA

Installed capacity deltas compared to base case by state[1]

GW (2030)



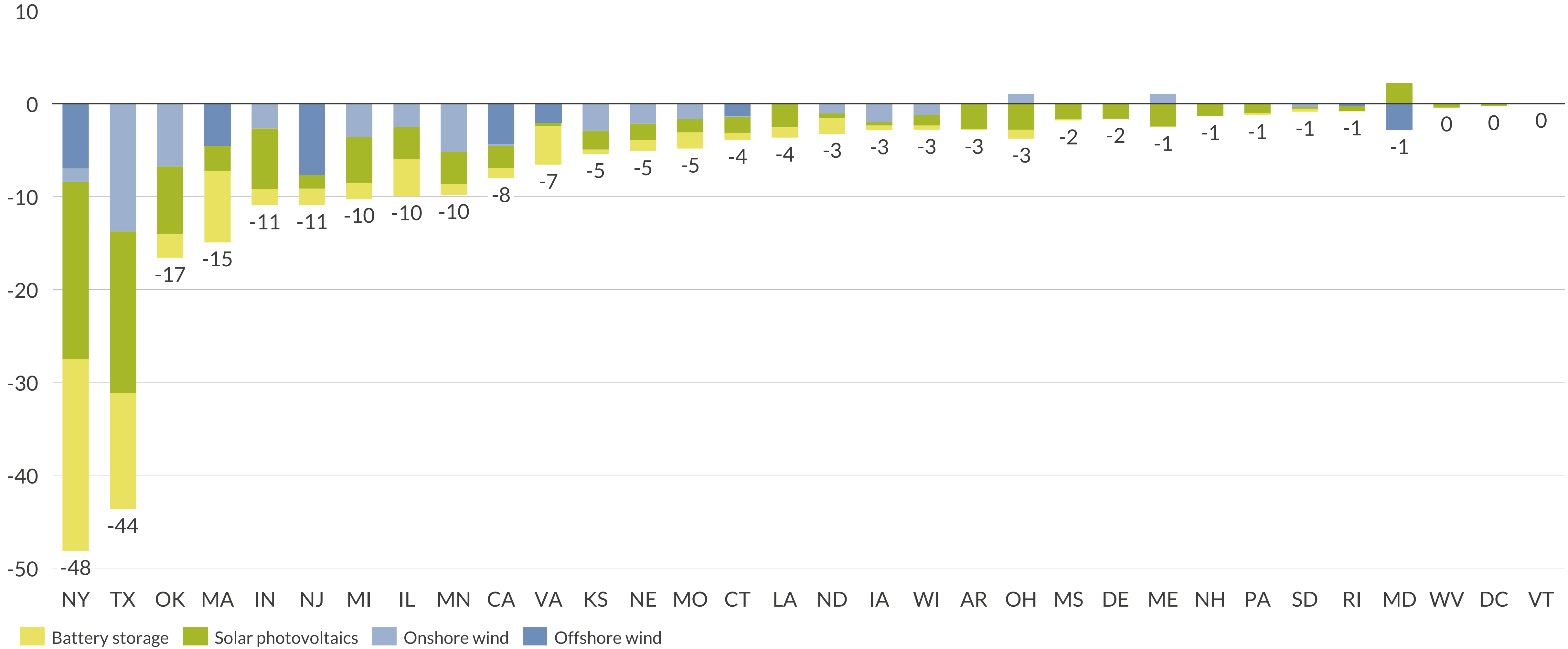
1) Analysis available for deregulated wholesale markets covering 31 states and the District of Columbia.

Sources: Aurora Energy Research

Capacity delta by state, 2040

AURORA

Installed capacity deltas compared to base case by state[1]
GW (2040)



1) Analysis available for deregulated wholesale markets covering 31 states and the District of Columbia.

Sources: Aurora Energy Research

Results by state, 2030

AURORA

State	Battery storage delta (MW)	Solar photovoltaics delta (MW)	Onshore wind delta (MW)	Offshore wind delta (MW)	Total capacity delta (MW)	Investment delta ($bn, 2023 real)	Clean energy jobs delta	Monthly retail price delta (%)	Monthly retail price delta ($, 2023 real)
Arkansas	-82.5	-696.6	-5.0	0.0	-784.1	-0.89	-127	0.1%	$0.18
California	-305.8	-2406.2	-1205.4	-150.0	-4067.4	-6.69	-1710	3.5%	$3.85
Connecticut	-141.2	-1143.0	-8.3	-229.4	-1521.8	-2.16	-518	4.0%	$6.28
Delaware	0.0	-1121.4	20.9	0.0	-1100.5	-1.18	-168	2.7%	$3.55
District of Columbia	0.0	-159.8	0.0	0.0	-159.8	-0.17	-27	1.5%	$1.25
Illinois	-577.1	-2467.2	-225.0	0.0	-3269.3	-3.65	-654	1.2%	$1.62
Indiana	-139.7	-1548.0	-516.0	0.0	-2203.7	-2.74	-733	0.9%	$1.35
Iowa	0.0	-6.0	-110.0	0.0	-116.0	-0.19	-100	1.2%	$1.38
Kansas	-115.6	-924.7	-1644.0	0.0	-2684.2	-3.91	-1642	7.4%	$5.12
Louisiana	-30.0	-1457.6	-5.0	0.0	-1492.6	-1.66	-250	1.5%	$3.29
Maine	-23.4	-1063.0	-304.6	0.0	-1390.9	-1.79	-453	3.8%	$4.53
Maryland	0.0	283.9	-2.1	-913.0	-631.2	-2.98	-1187	1.5%	$1.58
Massachusetts	1.4	-1457.0	0.0	-760.8	-2216.4	-4.02	-1270	3.9%	$5.24
Michigan	-52.4	-1057.7	-506.1	0.0	-1616.3	-2.07	-636	1.0%	$1.38
Minnesota	-15.0	-6.0	-10.0	0.0	-31.0	-0.04	-11	1.0%	$1.48
Mississippi	0.0	-906.0	-5.0	0.0	-911.0	-1.04	-156	1.4%	$1.97

Sources: Aurora Energy Research

Results by state, 2030

State	Battery storage delta (MW)	Solar photovoltaics delta (MW)	Onshore wind delta (MW)	Offshore wind delta (MW)	Total capacity delta (MW)	Investment delta ($bn, 2023 real)	Clean energy jobs delta	Monthly retail price delta (%)	Monthly retail price delta ($, 2023 real)
Missouri	-29.6	-186.0	-43.5	0.0	-259.1	-0.32	-72	2.1%	$2.40
Nebraska	-245.5	-378.8	-529.1	0.0	-1153.4	-1.57	-556	1.1%	$0.74
New Hampshire	-8.9	-421.0	0.0	0.0	-429.9	-0.47	-71	3.8%	$5.05
New Jersey	-354.0	-1496.5	-1.6	-1306.0	-3158.0	-6.64	-2039	2.7%	$3.31
New York	-3818.7	-4706.2	-668.5	-1035.6	-10228.9	-14.48	-3049	3.1%	$6.01
North Dakota	-338.0	-207.4	-312.5	0.0	-857.9	-0.98	-339	2.5%	$2.01
Ohio	-64.8	-2805.7	-38.0	0.0	-2908.5	-3.30	-507	0.7%	$0.67
Oklahoma	-1312.6	-3457.4	-2581.2	0.0	-7351.2	-9.38	-2991	-2.1%	-$1.71
Pennsylvania	-2.0	-2180.3	-53.0	0.0	-2235.3	-2.53	-412	1.8%	$2.49
Rhode Island	-7.9	-483.0	0.0	-44.8	-535.7	-0.69	-142	3.8%	$3.81
South Dakota	-62.5	-58.0	-94.7	0.0	-215.3	-0.26	-99	3.3%	$2.16
Texas	-3608.8	-5590.9	-9051.9	0.0	-18251.6	-23.42	-9329	11.2%	$16.75
Vermont	-7.5	-3.0	0.0	0.0	-10.5	-0.01	-1	3.8%	$3.22
Virginia	-107.4	-2069.7	-15.0	-1147.0	-3339.2	-6.58	-1915	2.0%	$2.87
West Virginia	0.0	-409.0	-16.0	0.0	-425.0	-0.49	-83	1.5%	$2.72
Wisconsin	0.0	-93.4	-13.9	0.0	-107.3	-0.14	-28	0.8%	$0.88

Sources: Aurora Energy Research

Results by state, 2040

AURORA

State	Battery storage delta (MW)	Solar photovoltaics delta (MW)	Onshore wind delta (MW)	Offshore wind delta (MW)	Total capacity delta (MW)	Investment delta ($bn, 2023 real)	Clean energy jobs delta	Monthly retail price delta (%)	Monthly retail price delta ($, 2023 real)
Arkansas	-82.5	-2717.3	22.3	0.0	-2777.5	-2.78	-439	7.0%	$15.85
California	-1094.5	-2366.2	-204.2	-4350.0	-8014.9	-22.08	-6527	9.7%	$8.22
Connecticut	-757.6	-1748.0	-7.4	-1376.2	-3889.2	-6.71	-2209	16.5%	$18.47
Delaware	0.0	-1618.0	26.0	0.0	-1592.1	-1.81	-247	7.4%	$8.68
District of Columbia	0.0	-256.9	0.0	0.0	-256.9	-0.27	-43	3.8%	$2.77
Illinois	-4004.0	-3475.6	-2483.1	0.0	-9962.7	-11.40	-3092	4.0%	$6.25
Indiana	-1714.7	-6543.0	-2671.6	0.0	-10929.2	-12.47	-3615	3.3%	$5.32
Iowa	-500.0	-400.0	-1954.0	0.0	-2854.0	-4.02	-1860	10.7%	$13.11
Kansas	-463.9	-2037.3	-2904.6	0.0	-5405.8	-7.40	-2986	14.1%	$8.95
Louisiana	-1078.8	-2554.8	-2.0	0.0	-3635.6	-3.68	-503	6.7%	$20.72
Maine	-23.4	-2460.0	1016.7	0.0	-1466.6	-0.84	503	16.7%	$15.25
Maryland	0.0	2247.8	16.7	-2821.0	-556.5	-7.61	-3418	4.9%	$4.05
Massachusetts	-7697.6	-2664.6	1.7	-4564.7	-14925.2	-22.73	-7137	16.6%	$16.48
Michigan	-1663.8	-4977.6	-3597.4	0.0	-10238.8	-12.34	-4184	3.0%	$4.93
Minnesota	-1143.3	-3500.0	-5162.9	0.0	-9806.2	-12.82	-5310	12.4%	$21.85
Mississippi	-162.1	-1627.2	-2.0	0.0	-1791.3	-1.91	-285	6.9%	$8.61

Sources: Aurora Energy Research

Results by state, 2040

State	Battery storage delta (MW)	Solar photovoltaics delta (MW)	Onshore wind delta (MW)	Offshore wind delta (MW)	Total capacity delta (MW)	Investment delta ($bn, 2023 real)	Clean energy jobs delta	Monthly retail price delta (%)	Monthly retail price delta ($, 2023 real)
Missouri	-1747.0	-1420.2	-1659.2	0.0	-4826.4	-5.65	-1851	8.9%	$10.44
Nebraska	-1217.0	-1746.0	-2152.5	0.0	-5115.6	-6.38	-2313	8.7%	$3.81
New Hampshire	-9.0	-1306.8	0.0	0.0	-1315.7	-1.36	-219	16.7%	$16.30
New Jersey	-1753.6	-1471.6	12.7	-7680.3	-10892.8	-29.41	-10724	8.0%	$9.11
New York	-20672.0	-19106.5	-1395.6	-6979.9	-48154.0	-66.04	-15296	17.1%	$39.46
North Dakota	-1662.7	-541.5	-1027.9	0.0	-3232.0	-3.62	-1130	8.4%	$5.89
Ohio	-957.2	-2792.5	1054.5	0.0	-2695.2	-2.26	417	1.9%	$1.56
Oklahoma	-2512.3	-7303.5	-6762.4	0.0	-16578.2	-21.01	-7479	3.9%	$2.29
Pennsylvania	-197.6	-1014.9	0.9	0.0	-1211.6	-1.63	-182	5.3%	$6.45
Rhode Island	-7.9	-544.0	0.0	-269.1	-821.0	-1.45	-455	16.7%	$13.44
South Dakota	-331.6	-205.8	-324.9	0.0	-862.4	-1.01	-350	12.4%	$7.02
Texas	-12474.7	-17406.2	-13758.2	0.0	-43639.1	-50.12	-16150	22.1%	$28.54
Vermont	-7.5	0.0	0.0	0.0	-7.5	-0.01	-1	16.7%	$10.96
Virginia	-4158.1	-317.8	43.3	-2080.0	-6512.6	-11.25	-3109	2.8%	$3.44
West Virginia	0.0	-406.0	14.1	0.0	-391.9	-0.44	-55	2.4%	$4.18
Wisconsin	-451.2	-1166.2	-1185.6	0.0	-2803.0	-3.48	-1293	10.3%	$9.46

Sources: Aurora Energy Research

Agenda

AURORA

Aurora provides independent forecasts and data-driven intelligence for the global energy transition

AURORA

Power markets

Renewables & PPAs

Storage

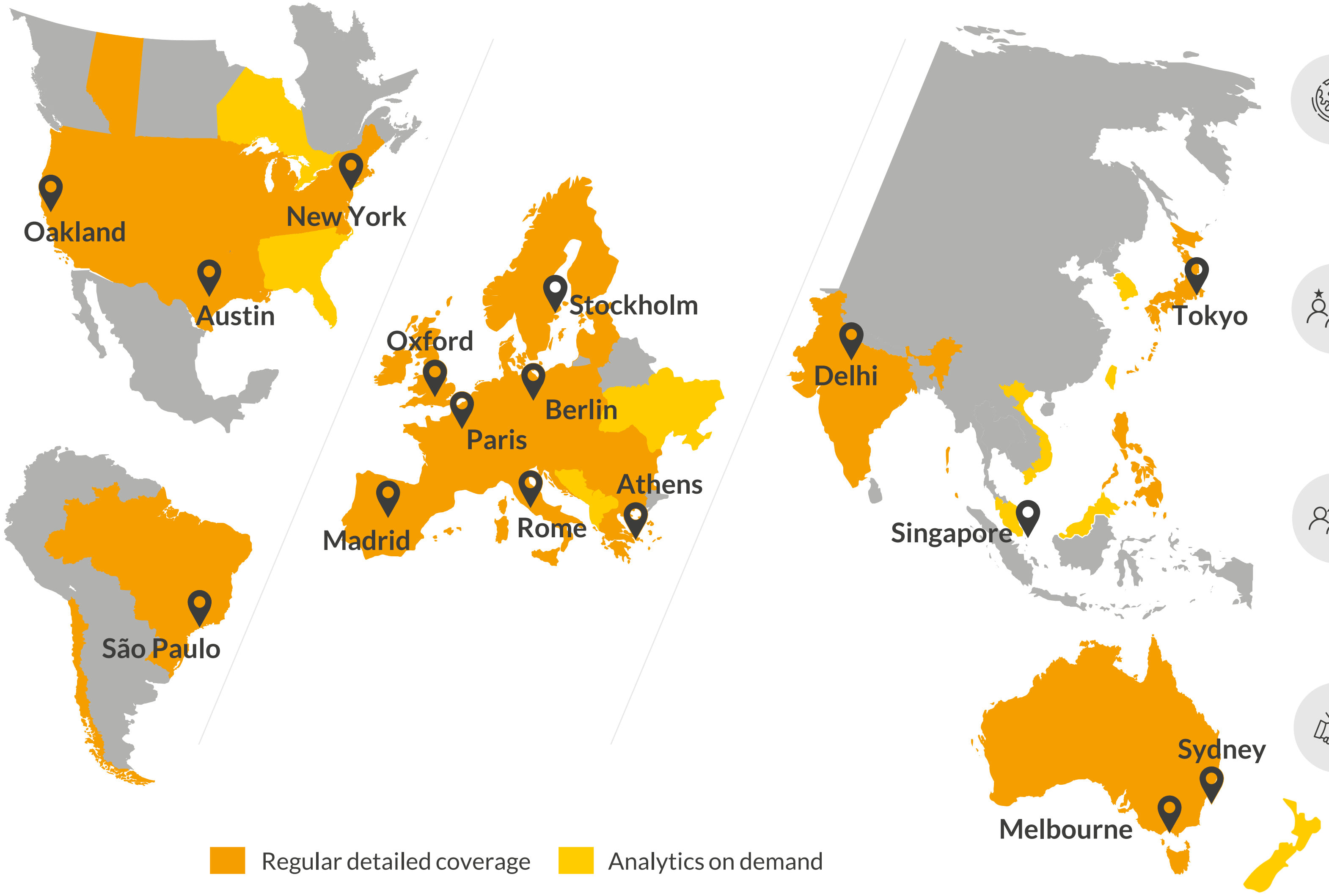
Grid & Congestion

Electric vehicles

Hydrogen H_2

Carbon CO_2

Natural gas



16 offices

900+ market experts

850+ subscribing companies

150+ transactions supported in 2024

Source: Aurora Energy Research

Our market-leading models underpin a comprehensive range of seamlessly integrated services to best suit your needs

AURORA

Customization of services

Advisory

Access tailored expert advice and analytics for your crucial projects. Dedicated support for strategy, investments, transactions and policy engagements

1400+ projects globally

Trusted consulting for project valuation, debt/tax equity financing, capital raises, project siting, policy analysis, and PPA support

Software Solutions

Make standard analysis bespoke with direct access to our models. Unique SaaS subscriptions to create your own scenarios and asset-specific investment cases

100+ company licenses

Market-level simulation tool: Origin

Asset-level valuation tools for batteries, wind, and solar

Aurora Maps visualizer for siting analysis and nodal forecasts

Subscription Analytics

Receive quarterly outlook reports, bankable price forecasts, **sample investment cases and timely strategic insights** for power and commodities

850+ subscribing companies

Power & Renewables fundamental reports including bankable price forecasts & strategic insights

Bankable battery storage analysis with detailed costs and revenue for investment cases

Bankable nodal basis forecasts, spatial analysis & nodal trends based on bottom-up power flow modelling

Models & Data

Market-leading models for power, gas, hydrogen, carbon, oil & coal markets

Proprietary and continuously updated cutting-edge models populated with highest quality curated datasets

Developed over 10 years, 70+ dedicated modellers

Source: Aurora Energy Research

Aurora services: subscriptions providing price forecasts and market analytics for developers, asset owners, investors, energy consumers, and regulators

AURORA

Subscription Analytics: Receive regularly updated forecasts, sample investment cases and timely deep-dives

Ad-hoc customized support:

1 Power & Renewables

Keep up to date on a specific power market; zonal price curves as well as in-depth quarterly reports and events to keep a pulse on market *(Quarterly updates)*

What the service is:
- Bankable monthly forecasts (2050) to support asset financing , scenario analysis; in-depth fundamental analysis to underpin your investment strategies
- Roundtable discussions, workshops and ongoing support from dedicated teams

Assorted use case examples:
- Understanding a market at depth and keeping up to date with market and policy developments, with on-call, ad hoc support
- Reliable, bankable wholesale price forecasts to support asset financing and valuations - six scenarios updated quarterly

2 Flexible Energy Add-on

Go deep on battery and peaker business case economics and fundamentals. Understand hourly granularity of a specific market to build investment cases *(Quarterly updates)*

What the service is:
- Detailed analysis and hourly granular forecasts for power, balancing, and ancillary services plus investment case data for battery & peakers
- Roundtable discussions, workshops and ongoing support from dedicated teams

Assorted use case examples:
- Developer seeking to understand detailed battery costs and revenue streams/stacking across various configurations
- Investor comparing differences in BESS gross margin, IRR, NPV across hubs and entry years with representative nodal basis

3 Nodal Add-on

Understand nodal economics and trends through bottom-up power flow modelling. Site specific valuation, congestion, curtailment and other uses cases *(Quarterly updates)*

What the service is:
- Bankable nodal forecasts, spatial congestion analysis, site-specific valuation and other features through bottom-up power flow modelling
- Roundtable discussions, workshops and ongoing support from dedicated teams

Assorted use case examples:
- Investor evaluating site specific risks and implications during phase 1 of a transaction
- Developer seeking to identify the drivers and trends in congestion patterns and nodal pricing outcomes throughout the system to support early development pipeline

4 Advisory

Best for: Custom projects or transactions that need dedicated expert support. Typically, transaction diligence and asset valuations

What the service is:
- Tailored expert advice and analytics support to deliver diligence on a specific project including advisory transactions, policy views, and strategy insights

Assorted use case examples:
- Developer seeking bespoke nodal forecast and asset valuation with sensitivity analysis
- Investment firm seeking due diligence support to derisk a specific transaction
- Regulator seeking to understand policy impact of market reforms

Unique, proprietary, in-house modelling capabilities underpin Aurora's superior analysis

AURORA

5 Integrated Models

- Global Commodities (AER-GLO)
- Hydrogen (AER-HY)
- Gas (AER-GAS)
- Power markets (AER-ES)
- Nodal/network model (AER-EN)

INPUTS

- Technology
- Policy
- Demand
- Commodity prices[1]
- Weather patterns

Dispatch model

- ½ hourly or hourly
- Iterative modelling
- Dynamic dispatch of plant
- Endogenous interconnector flows

Continuous iteration until an equilibrium is reached

Investment decisions module

- Capacity market modelling
- Capacity build / exit / mothballing
- IRR / NPV driven
- Detailed technology assessments

OUTPUTS

- Capacity mix
- Generation mix
- Power & Ancillary Service prices
- Capacity market prices
- Profit / Loss and NPV
- Electric vehicle charging

ADDITIONAL INPUTS

- Network snapshot - existing & future
- Nodal load map
- Nodal generation map

OUTPUTS

- Power flows & losses
- Nodal prices / loss factors

Up to 70	c. 85k	~15k	80+	Quarterly updates
specifications modelled for each plant	investment hours on modelling capabilities	model runs per week	strength of modelling team globally	through subscription research

1) Gas, coal, oil and carbon prices fundamentally modelled in-house with fully integrated commodities and gas market model

Source: Aurora Energy Research

Details and disclaimer

Publication
Impact of reform to clean energy tax credits on investment, jobs and consumer bills

Date
January 6, 2025

Prepared by
Lizzie Bonahoom
(Lizzie.Bonahoom@auroraer.com)
Connor McMann
(Connor.McMann@auroraer.com)
Callaway Sprinkle
(Callaway.Sprinkle@auroraer.com)

Approved by
Oliver Kerr
(Oliver.Kerr@auroraer.com)
Olivier Beaufils
(Olivier.Beaufils@auroraer.com)

General Disclaimer

Forward-looking statements

Copyright

AURORA

ENERGY RESEARCH

February 4, 2025

Via Email

The Honorable Bob Latta
Chairman, Subcommittee on Energy
House Committee on Energy & Commerce
2470 Rayburn House Office Building
Washington, D.C. 20515

The Honorable Kathy Castor
Ranking Member, Subcommittee on Energy
House Committee on Energy & Commerce
2188 Rayburn House Office Building
Washington, D.C. 20515

Re: Hearing on "Powering America's Future: Unleashing American Energy"

Dear Chairman Latta and Ranking Member Castor:

On behalf of America's leading independent oil and natural gas producers, the American Exploration & Production Council (AXPC)[1] supports the full Committee and Subcommittee's pro-American energy agenda.

This Congress has an opportunity to implement durable reforms that will unlock our country's full energy potential. Reforms are needed across the supply chain to meet an ever-increasing demand, while providing ever more affordable, reliable, and cleaner sources of fuel. Solving this dilemma means greater domestic energy independence and global energy stability, while providing more local jobs, greater economic growth, and lower costs.

Since the shale revolution began in 2005, our country has become the world leader in both the production of oil and natural gas *and* emissions reductions. While the United States' energy production grew to 20% of global oil and 25% of global natural gas, we've also reduced emissions by 18% since 2005 — outperforming the average of all Organization for Economic Co-operation and Development (OECD) countries.[2] Our American energy revolution has powered our nation's manufacturing revival, fueled our economic growth, and been a stabilizing force in the world.

Our ability to produce more energy with less emissions is critical to meeting a very real, looming demand. We're only at the beginning of power needs from data centers and AI, but U.S. energy demand projections are astounding. Power demand from data centers is on track to grow more than 160% by 2030, compared to 2023 levels.[3] AI searches require ten times the amount of electricity compared to a traditional Google search. Data centers alone are expected to add about 323 terawatt hours (TWh) of electricity demand by 2030 (more than double the power demand of New York City). And the number of data centers in our country already has doubled over the past two years.[4] Natural gas alone is expected to provide 60% of the power demand growth.[5] Our AI ambitions are limited only by our ability to power them with reliable, American-made energy.

---

[1] AXPC's membership spans every major energy basin in the United States and collectively produces about half of our country's oil and over half of our natural gas. As a sector, American upstream producers bring nearly half a trillion dollars of total economic value, over 3 million jobs, and an average wage of $107,000 per year (nearly double the U.S. mean).

[2] In contrast, China, which is responsible for 35% of global emissions compared to our 13%, has doubled its emissions since 2005.

[3] Goldman Sachs, AI Is Poised to Drive 160% Increase in Data Center Power Demand (2024), available at link.

[4] North American Electric Reliability Corporation (NERC), Summer Reliability Assessment (2024), available at link.

[5] S&P Global, Data Centers: Rapid Growth Will Test U.S. Tech Sector's Decarbonization Ambitions (2024), available at link.

That's just in the United States. By most estimates, demand for both oil and natural gas is expected to increase by about 50% between now and 2050.[6] As they should: Today, roughly 3.5 billion people don't have reliable access to electricity and 774 million don't have access to any electricity.[7] American exports keep prices lower and stable at home, while providing our allies around the globe with responsibly sourced energy. This growing demand will be met. The question is by whom: Us or our global adversaries?

While this Subcommittee should undertake a comprehensive review of policy solutions to unlock American energy today and for the long-term, we offer five ready-made areas of reform from the upstream sector's perspective:

- **Emissions Policy:** Foster Continued Emissions Reductions Through Innovation and Workable Regulation
- **Exports:** Leverage American Energy for National Security and Global Environmental Leadership
- **Permitting Reform:** Address Barriers to the Development of Energy Infrastructure
- **Taxes and Trade:** Ensure a Fair and Competitive Tax and Trade Regime for American Energy Producers
- **Federal Lands:** Re-Open the Responsible Development of America's Energy Resources

Given the Committee's jurisdiction, we'll elaborate on the first three.

First, advancing smart emissions policy.

Since 2015, the American upstream sector has reduced methane intensity by 61% and overall methane emissions by 42%,[8] even as production increased by 30%.[9] Policy should enable us to build on this success.

Our members remain focused on reducing methane emissions from their operations and support effective and reasonable regulation that balances the essential value of American oil and natural gas production with the global challenge of addressing climate change. That is why we support many of the requirements in the EPA's methane rule (i.e., OOOOb/c regulations) and updated revisions to the Subpart W regulations, while other areas of the rules can be improved through the administrative process.

But the methane tax — enacted by the 2022 Inflation Reduction Act (IRA) — should be repealed. This punitive tax raises costs on American energy production and stifles ongoing, significant progress and investment to reduce U.S. emissions.

Combating global emissions is a global challenge. We should have a regulatory framework that maintains our global leadership in emissions reductions and promotes global competitiveness in energy production.

Second, promoting the export of American energy.

The shale revolution propelled the United States to be not only the largest producer of oil and natural gas in the world but also a leading exporter. Since 2015, when oil export restrictions were lifted and the first liquefied natural gas (LNG) cargo was shipped, we've become the fourth largest exporter of oil and the

[6] Data analyzed from the Energy Information Administration, OPEC World Outlook, and the International Energy Agency.

[7] Data analyzed from the International Energy Agency's SDG7 Energy Progress Report and the Payne Institute's Energy for Growth Hub.

[8] Data analyzed from the Clean Air Task Force/Ceres Report on Benchmarking Oil and Gas Emissions and Environmental Protection Agency.

[9] Data analyzed from the Energy Information Administration and Environmental Protection Agency.

largest exporter of natural gas.[10] When Russia invaded Ukraine in 2022, the United States filled the energy gap for European allies and further mitigated Russia's influence in the region.

Our energy resources have become one of the most effective strategic tools to enhance national security, stabilize global markets, limit geopolitical uncertainty, and reduce global emissions. Our natural gas transitions the world from higher-emitting sources, resulting in significant emissions reductions across the world. Despite these clear benefits, U.S. LNG has recently faced significant political and policy headwinds that question the reliability of America as a global supplier.

American energy exports support lower prices both domestically and globally. We have more than enough reserves to meet domestic demand and supply international partners, while keeping prices low and stable here at home. What we need is durable process and policy that advances a pro-American-energy agenda abroad and embraces the export of American-made oil and natural gas.

Third, bolstering energy infrastructure through permitting reform.

To meet growing domestic and global demand, we need modern energy infrastructure. Unfortunately, our ability to produce, transport, and deliver all energy sources — from the molecules in the ground to the energy and products demanded by families and businesses — is hampered by outdated permitting laws. Permitting for most energy projects can take at least 4.5 years and then delayed even longer because of frivolous third-party challenges and litigation delays. These pitfalls go well beyond traditional energy: advanced manufacturing, infrastructure development, electricity transmission, carbon sequestration, and renewable deployment are all caught in the same morass that is federal permitting.

Comprehensive, commonsense reforms are essential to unleashing American energy in all its forms. This includes wholesale reforms of the federal permitting process, like judicial review, for energy projects to create a more efficient, predictable, and transparent framework that incentivizes investment and encourages American energy to build again.

***

On behalf of America's leading independent producers of oil and natural gas, we look forward to working with this Congress and the Energy & Commerce Committee enact a pro-American energy agenda.

Sincerely,

Anne Bradbury

Anne Bradbury
President & CEO, American Exploration & Production Council

cc: Members of the Subcommittee on Energy

[10] Data analyzed from the Energy Information Administration.

Statement from U.S. Secretary of Energy Jennifer M. Granholm on Updated Final Analyses

The Natural Gas Act has given the U.S. Secretary of Energy the responsibility to evaluate whether authorizations for the export of liquefied natural gas to non-free-trade-agreement countries is consistent with the "public interest." That determination includes a wide variety of factors including impact on American consumers, workers, and the environment. We have now finalized our update of various pieces of analysis for public comment.

I want to take this opportunity to highlight five key findings and considerations that I think are especially relevant to help guide future Secretaries of Energy in making decisions about whether particular applications are in the public interest. Today's publication reinforces that a business-as-usual approach is neither sustainable nor advisable.

First, the pace of growth of U.S. natural gas exports in recent years is truly astounding and many analysts say continued growth on this trajectory will quickly outpace global demand. By itself, this rapid growth to date – and the continued growth we expect under existing authorizations – recommends a cautious approach going forward. U.S. LNG exports have already tripled over the past five years, will double again by 2030, and could double yet again under existing authorizations. The quantities already approved for export equate to roughly half of the U.S.'s total current natural gas production today. In 4 of 5 modeling scenarios included in today's study, the amounts that have already been approved will be more than sufficient to meet global demand for U.S. LNG for decades to come.

Second, while these dramatically increasing LNG exports generate wealth for the owners of export facilities and create jobs across the natural gas supply chain, our public interest review requires a comprehensive economic analysis. The U.S. Department of Energy's (DOE) updated study finds that a wide range of domestic consumers of natural gas – from households to farmers to heavy industry – would face higher prices from increased exports. The study put forward today finds that unfettered exports of LNG would increase wholesale domestic natural gas prices by over 30%. Unconstrained exports of LNG would increase costs for the average American household by well over $100 more per year by 2050. We have recently lived through the real-world ripple effects of increased energy prices domestically and globally since the pandemic. Middle and low-income households already face energy bills that are too high. In parts of the South, the export-induced price increase would put some households over the energy burden threshold, further challenging their ability to meet basic needs.

In fact, DOE analysis exposes a triple-cost increase to U.S. consumers from increasing LNG exports – the increasing domestic price of the natural gas itself, increases in electricity prices (natural gas being a key input in many U.S. power markets), and the increased costs for consumers from the pass-through of higher costs to U.S. manufacturers. On the latter point, the new study finds that from 2020 to 2050, the overall energy costs for the industrial sector would go up $125B, leading to additional potential price increases for a wide range of consumer goods.

To date, U.S. consumers and businesses have benefited from relatively stable natural gas prices domestically as compared to those in other parts of the world who have faced far greater price volatility. The more volumes of U.S. LNG are exported, the greater the risk of this global price volatility being imported into our domestic market and impacting U.S. consumers and manufacturers.

Third, LNG facilities tend to be concentrated in communities that are being asked to shoulder the additional burden of pollution from increased natural gas production and liquefaction. This comes on top of existing environmental burdens from refining, petrochemical, and other industries already concentrated near these communities. Pollutants such as methane, volatile organic compounds, particulate matter, nitrogen oxides, and others lead to higher mortality rates in communities where oil and gas are extracted and processed – a problem that, absent regulatory intervention, will only get worse, if volumes of LNG exports continue to dramatically increase. It is notable that just recently the U.S. Federal Energy Regulatory Commission required Supplemental Environmental Impact Statements for two LNG projects with export applications then pending before DOE – CP2 and Commonwealth – to undertake further analysis on air pollution impacts to surrounding communities. With our latest final analysis, DOE has specifically requested additional public input from affected communities, workers, local businesses, academic researchers, and other stakeholders about all the various impacts – health, economic, and environmental – on those most directly affected by gas exports.

Fourth, the climate impact of ever greater exports of LNG merits a close and rigorous focus, especially in a world that needs to quickly reduce greenhouse gas emissions substantially across the board to meet our global commitment of limiting warming to 1.5 C. While some tout LNG as a means to reduce the use of coal overseas (and to date that has been the case with some importing countries), the study put forward today shows a world in which additional U.S. LNG exports displace more renewables than coal globally. As stated earlier, 4 out of 5 scenarios, currently authorized levels of U.S. LNG exports are already more than enough to meet global demand. In the fifth scenario in which U.S. LNG exports exceed currently authorized levels, the annual direct emissions associated with exports in 2050, not considering market effects of the exported gas, would be 1.5 gigatons of CO_2 equivalent, or just over 25 percent of current U.S. annual greenhouse gas emissions.

And in every scenario, increases in LNG exports would lead to increases in global net emissions – despite very aggressive assumptions in the model regarding deployment of carbon capture, utilization, and storage (6.6 Gt CO_2 to 20 Gt CO_2 annually in 2050 across the scenarios). The extent of net emissions increases resulting from additional U.S. LNG exports will depend on market effects addressed in the study, such as changes in energy demand and the sources used to meet that demand for electricity and other uses of natural gas.

The study shows that climate emissions associated with LNG can vary widely from the point of extraction, through midstream transportation and liquefaction, to end use. Accounting for the

GHG intensity of LNG cargoes should be a central consideration for future operations of the DOE program and of global trade in LNG more generally. The European Union has enacted a law that will impose requirements on its LNG suppliers to limit emissions associated with natural gas production by later this decade, with a methane intensity requirement implemented in 2030. Seeking to account for and to reduce emissions associated with U.S. LNG production throughout the supply chain is critical to U.S. economic competitiveness over the medium term. Such efforts can be supported both by the operations of DOE's program, as well as by regulatory efforts to reduce methane emissions in the oil and gas sector.

Special scrutiny needs to be applied toward very large LNG projects. An LNG project exporting 4 billion cubic feet per day – considering its direct life cycle emissions – would yield more annual greenhouse gas emissions by itself than 141 of the world's countries each did in 2023.

Fifth, any sound and durable approach for considering additional authorizations should consider where those LNG exports are headed, and whether targeted guardrails may be utilized to protect the public interest. Over the past few years, U.S. LNG has proven critical for our allies in Europe as they wean themselves off Russian gas. However, European demand for natural gas has flattened and is set to decline substantially in line with Europe's efforts to reduce its climate footprint. LNG demand has already peaked in Japan, and growth is expected to flatten in South Korea by 2030. On the other hand, based on current global demand for LNG, the People's Republic of China is already the world's largest importer. Looking ahead China's LNG exports are expected to nearly double between now and 2030, and China's LNG imports are expected to be the highest of any country through 2050. PRC entities have already signed several contracts with operating or proposed U.S. LNG projects. Future authorization decisions of what is in the "public interest" need not be made solely on a binary – yes or no – basis but could be undertaken using a broader framework of requirements for all authorizations.
Regardless of what happens in each cycle of elections, the effect of increased energy prices for domestic consumers combined with the negative impacts to local communities and the climate will continue to grow as exports increase. In the decade to come, we will see strong and mounting pressure within our democratic system to ensure that the United States uses its market position in a way that truly advances our national interest and energy security, which must include the needs of American workers, American families, and our responsibility to address the climate crisis. In our view, the question is not *whether* U.S. export policy will be forced to respond to those interests, but *when* and *what* that response is.

At the beginning of this year, we made the decision to pause new LNG export decisions while we awaited the completion of a new study examining the economic and environmental impacts of increased LNG export volumes. That final study, now available for public comment, exposes a whole range of considerations that must be taken into account. Given that the comment period for the study will continue into the next Administration – and that there are a limited number of applications that are concurrently ready for the DOE "public interest" review – decisions about the future of LNG export levels will necessarily be made by future Administrations.

Our hope is that we can now assess the future of natural gas exports based on the facts and ensure authorizations are reviewed in a manner that truly advances the public interest of <u>all</u> the American people.