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POWERING AI: EXAMINING AMERICA'S
ENERGY AND TECHNOLOGY FUTURE
TUESDAY, JUNE 4, 2024
House of Representatives,
Subcommittee on Energy, Climate, and Grid Security,
Committee on Energy and Commerce,
Washington, D.C.

The subcommittee met, pursuant to call, at 10:00 a.m. in Room 2123, Rayburn House Office Building, Hon. Jeff Duncan [chairman of the subcommittee], presiding.

Present: Representatives Duncan, Burgess, Latta, Guthrie, Griffith, Bucshon, Walberg, Curtis, Lesko, Pence, Armstrong, Weber, Allen, Balderson, Pfluger, Rodgers (ex officio); DeGette, Peters, Fletcher, Matsui, Tonko, Veasey,

Kuster, Schrier, Castor, Sarbanes, Cardenas, and Pallone (ex officio).

Also present: Representatives Carter, Joyce; and Barragan.

Staff Present: Sarah Burke, Deputy Staff Director; David Burns, Professional Staff Member; Nick Crocker, Senior Advisor and Director of Coalitions; Sydney Greene, Director of Operations; Nate Hodson, Staff Director; Tara Hupman, Chief Counsel; Sean Kelly, Press Secretary; Alex Khlopin, Staff Assistant; Peter Kielty, General Counsel; Emily King, Member Services Director; Elise Krekorian, Counsel; Mary Martin, Chief Counsel; Brandon Mooney, Deputy Chief Counsel; Kaitlyn Peterson, Clerk; Kate Roberts, Digital Director; Peter Spencer, Senior Professional Staff Member; Waverly Gordon, Minority Deputy Staff Director and General Counsel; Sanjana Miryala, Minority Intern; Kristopher Pittard, Minority Professional Staff Member; Emma Roehrig, Minority Staff Assistant; Kylea Rogers, Minority Policy Analyst;

Andrew Souvall, Minority Director of Communications, Outreach, and Member Services; and Tuley Wright, Minority Staff Director, Energy, Climate, and Grid Security.

*Mr. Duncan. The Subcommittee on Energy, Climate, and Grid Security will now come to order. The chair recognizes himself for five minutes from an opening statement.

We have -- votes are going to be called at 10:30. We are going to get as far as we can, so that is why we are trying to rush a little bit.

I want to thank you all for being here, and welcome to the Energy, Climate, and Grid Security Subcommittee hearing entitled, "Powering AI: Examining America's Energy and Technology Future.''

We are here today to examine the next frontier of the American economy: the digital information economy. Data centers and AI are powerful tools that give America an edge. To stay ahead of our adversaries and competitors, we must keep this edge. At the same time, we have to maintain our energy dominance. America is blessed with tremendous natural resources. Our energy future directly impacts our technology future. In fact, our energy dominance will now be the reason for our technology dominance.

For decades, electricity demands have remained flat. That is no longer the case. In fact, we are seeing demand

grow at a scale and pace that many utilities have never seen before. By some estimates, demand will grow by five percent per year nationwide through the end of the decade. But in certain parts of the country demand could grow by as much as 20 percent. Regardless of the exact number, we know electricity demand is surging in many places because of data center growth, new manufacturing, and electrification.

This electricity demand from data centers and manufacturing is not like residential demand that uses a little electricity here and there, and can be asked to turn off through demand response and virtual power plants. Many of these enterprises run non-stop at 90 percent of their full potential. They can't afford disruptions, shortfalls, or blackouts. They require 24/7/365 electricity to power American innovation. If data centers, including those using AI, need constant power, they cannot rely upon intermittent resources for that firm and dispatchable power.

At the same time, we are seeing demand surge. Grid experts have warned for years that the reliability of our electric grid is in danger of blackouts. Much of this grid reliability crisis is because of the premature retirement of

our most reliable resources like coal, natural gas, and nuclear power. A perfect example of this is the nation's largest grid operator, PJM. Two states seeing some of the largest increases in data center demand, Virginia and Ohio, are in the PJM. PJM is warning us that up to 30 percent of its generation could retire by 2030, while energy consumption is projected to increase by 40 percent by 2039. So on one hand, we are subtracting our most reliable generation, and on the other hand we are saying we need more power.

If the U.S. is going to rise to the energy and technology challenge, we must embrace energy expansion. Pipelines are essential to the energy security of the United States. If we don't have the necessary infrastructure to deliver energy from producers to consumers, we will undercut our economic, energy, and technology security. If we are going to meet the energy needs and climate pledges of technology companies, we are going to need both new nuclear, both large reactors and small modular reactors.

The bipartisan work this committee has done on nuclear energy with the Atomic Energy Advancement Act will help deploy more nuclear energy emission-free firm generation. As

we build out this new infrastructure, we must ensure that residential ratepayers, feeling the squeeze from inflationary policies of the Biden Administration, are not burdened with even higher utility bills. Despite the many benefits of data centers, we must make sure that cost for electric infrastructure are paid by those customers causing the cost. They should not be disproportionately spread to residential ratepayers and other captive customers.

The pace and scale at which we are seeing data centers come online requires data center companies, utilities, regulators, and policymakers to all work together early and often. Communication, new frameworks, and long-term planning are vital to meeting the technology and energy needs of this decade and decades to come. So I want to thank the witnesses for being here today. We look forward to hearing from you and your expertise on how we can meet the energy demands of America's technology future.

[The prepared statement of Mr. Duncan follows:]

**********COMMITTEE INSERT**********

*Mr. Duncan. I will now recognize the ranking member, Ms. DeGette, for five minutes.

*Ms. DeGette. Thank you so much, Mr. Chairman.

After 20 years of stagnation, electricity demand is finally set to grow again. Driven by everything from data centers to a resurgence in domestic manufacturing to vehicle electrification, America is demanding more electricity. This increasing desire for electricity is a good thing. It means more people are making things in America, whether that is batteries, solar powers, or semiconductors. It means the critical industries that power the 21st century are going to be forged here at home, rather than outsourced abroad. It means more and higher-paying jobs for Americans. And in large part, that is due to the investments President Biden and congressional Democrats made two years ago through laws like the Inflation Reduction Act, Bipartisan Infrastructure Law, and CHIPS and Science Act.

But as we celebrate these new industries being built in the United States, we must make sure our power grid is up to the task. It will be, but only if we make necessary reforms to make sure that it can rise to the challenge. One of those

reforms is making it easier to build power generation and batteries, and to connect those resources to the grid. It takes an inexcusably long time for resources to connect to the grid now. Frankly, it is gotten so bad that some regional grids have had to pause accepting new requests while they deal with a backlog of existing requests. That is simply unacceptable.

Last year the Federal Energy Regulatory Commission made progress by issuing order 2023 which mandated reforms. But frankly, those reforms have not gone far enough. Grid operators must examine more aggressive strategies to allow enough supply to come onto the grid to match the forecasted increase in demand.

Another common-sense set of reforms would be to get more of our existing grid infrastructure, making sure grid operators are getting the most out of their existing wires, and optimizing existing interregional connections, allowing the grid to become more resilient at near zero cost. Frankly, these are easy, bipartisan solutions.

But we also must face the reality that the physical wires that comprise today's grid may not be fit for the

coming increase in power demand. We must make it easier to plan, permit, and pay for transmission lines in the U.S. if we want to maintain reliability in this new era of increasing power demand.

Last month FERC took an important first step in the right direction when it finalized order 1920, mandating regional grids engage in long-term planning using a specific set of criteria. That rule was a bipartisan victory, and it gained applause from across the political spectrum, everyone from the R Street Institute to the Conservative Energy Network to the former chair of FERC under President Trump. More importantly, the North American Electric Reliability Corporation, responsible for electric reliability in the U.S., said the rule was important.

But I want to be clear: that role by itself is not enough. It only covers planning for regional power lines, not the interregional lines that will be so important in the years and decades to come, especially given the expected load growth from data centers that will be heavily concentrated in just a few regions. FERC and Congress should and must do more to make sure our nation's grid will be ready for the

coming increase in power demand. Planning for adequate transmission will improve reliability and reduce costs, and that should be something every member of this subcommittee support.

Before I yield back, I also want to note this subcommittee has already done some work in preparing for load growth by passing what was first the Atomic Energy Advancement Act and is now the ADVANCE Act. It has been my pleasure to work together with the chairman, and I think that the bill will have important implications over the medium and long term for allowing new nuclear reactors to play an important role in supporting power demand.

Now, I bring this up because the House has now passed this bill -- twice, I might add -- now we just need the Senate to pass the bill on the Senate floor.

With that noted, and again emphasizing the most important thing we can do is ensure our power grid is ready to face increasing demand for electricity, I yield back.

[The prepared statement of Ms. DeGette follows:]

**********COMMITTEE INSERT**********

*Mr. Duncan. The gentlelady yields back. I now recognize the chair of the full committee, Mrs. Rodgers, for five minutes.

*The Chair. Good morning everyone. Thank you, Chairman Duncan.

For more than a century, American energy has powered our economy, raised our standard of living, and driven technological innovation that has improved the health and well-being of people across the country and around the world. It has been key to American technological leadership thus far, and will continue to be essential to ensuring we maintain that leadership in the future.

The data centers used to store and process the information that many of these emerging technologies utilize, along with the advanced manufacturing necessary to build them here at home, will require significantly more energy resources.

Energy is foundational to everything we do. The cornerstone of this foundation is affordable, reliable electricity. The more electricity we have, the more we can accomplish and innovate as a nation.

This Congress Energy and Commerce has led several hearings across our subcommittee exploring AI. We have examined the benefits and uses; the safeguards necessary to protect Americans, especially their privacy; and the urgency for maintaining our global leadership. We must meet the moment; our future prosperity and security depend on it. If we fail, China will control our future, and we cannot let that happen.

In order to beat China, we need to unleash American energy, not restrict it. In states across the country, utility planners and regulators are confronting the hard truth that they need more reliable power to meet the needs of their communities and the growing demands from our digital economy. Some are projecting a tenfold increase in the growth rate of new power demand compared with the past decade.

Just across the river in Northern Virginia, the power demand is projected to increase from 2,500 megawatts in 2020 to over 8,000 megawatts by 2028. In Georgia, utility companies had to quickly update their plans to reflect a jump from 400 megawatts of future demand to 6,600 megawatts. To

put that in perspective, Georgia would need about five more new Vogtle nuclear power plants to meet the level of demand.

Driving this demand in many cases are the industries that process digital information: the data centers that process cloud services, AI, and the digital transactions that are increasingly essential to modern life. These services are critical to advancing our nation's prosperity, and we will need more, not less, reliable, baseload power, the kind of power that can be generated 24 hours a day, 7 days a week, 365 days a year.

Even as we have seen spikes in demand across the country, the Biden Administration has continued taking steps to shut down reliable baseload sources. Recent EPA regulatory actions like the Clean Power Plan 2.0 will accelerate the retirement of the very baseload generation essential for reliable power or any meaningful growth. Grid operators and others have been sounding the alarm for years, warning the United States is on a dangerous and unsustainable path. Time and time again the grid experts have warned the committee that continuing this trend will mean higher prices for consumers and catastrophic blackouts. Doubling down on

anti-growth policies that restrict access to reliable energy sources and retire baseload power generation is not how we secure our energy or technological future.

Energy is foundational to every aspect of our economy and our way of life. We should be striving to assure our innovators can provide a more prosperous future for all Americans, and help secure our energy and technological leadership for the next century. That starts by ensuring states and regulators have the resources and infrastructure necessary to provide American families and businesses with reliable and affordable energy.

I look forward to hearing from our witnesses today about how we achieve these goals.

[The prepared statement of The Chair follows:]

**********COMMITTEE INSERT**********

*The Chair. Thank you, and I yield back.

*Mr. Duncan. The gentlelady yields back. I now recognize the ranking member of the full committee, Mr. Pallone, for five minutes.

*Mr. Pallone. Thank you, Mr. Chairman. And before I get to the subject of today's hearing I wanted to express my disappointment that committee Republicans have not scheduled a hearing on the shocking allegations of Big Oil colluding to drive up gas prices on hard-working American families. The allegations were revealed by the Federal Trade Commission as part of its probe of the Exxon and Pioneer merger. FTC alleges that Scott Sheffield, the CEO of Pioneer, colluded with OPEC and his competitors to artificially limit crude oil production and gouge Americans at the pump.

An American CEO colluding with a cartel that counts Russia, Iran, and Venezuela among its members is a massive scandal, and I have opened an investigation demanding answers from seven companies, including Exxon, which recently acquired Pioneer. And then last week I wrote Chair Rodgers requesting a hearing so that we could all have the opportunity to question Mr. Sheffield.

And so, Madam Chair, we must hold a hearing on these serious allegations immediately. If U.S. oil companies are colluding with each other and foreign cartels to manipulate global oil markets and harm American consumers who then pay more at the pump, Congress and the American people deserve to know. We must hold Big Oil accountable. That is the bottom line.

Now, moving to the subject of today's hearings, after 20 years of stagnant electricity demand we are now seeing the power sector transition to an era of increasing demand. And thanks to an American manufacturing renaissance driven by the Biden Administration's investments, electricity demand is projected to sharply increase in some corners of the nation over the next few years.

Data centers, some powering advancement in artificial intelligence technologies, are one component of the resurgence of American manufacturing. A report last week from the Electric Power Research Institute found that data center power usage could grow by 10 to 15 percent per year, meaning that their power consumption could nearly double by 2030. And as vehicle and home electrification efforts begin

to accelerate later in this decade, spurred largely by the Inflation Reduction Act, the entire country will see a broad-based increase in power demand.

But we can't respond to the challenges of the power grid of the 2020s with the technology of the 1920s. Already some utility and committee Republicans are saying that the only solution to this surge of power demand is to build more polluting gas power plants or, even worse, keep old coal plants on the grid even longer. And these are false solutions that would lock consumers into decades of paying for outdated and polluting technologies.

Republicans are also using increased electricity demand as an excuse to baselessly attack environmental regulations. Instead, our goal should be to look forward and connect as many clean resources to the grid as quickly as we possibly can.

A study from the Lawrence Berkeley National Laboratory shows that there is nearly as much capacity in the so-called interconnection queue as there is generation capacity installed in the United States today. Ninety-four percent of that queue was comprised of zero carbon resources like solar,

wind, and batteries. Even if a fraction of those generation and storage resources came online, that would be sufficient to deal with the increase in power demand. And our main priority should be accelerating the process of getting those resources connected to the grid.

It is also critical that we continue to encourage energy efficiency. By reducing the amount of energy used in homes and businesses throughout -- through more efficient appliances, we can offset some of the anticipated demand increases from data centers while also continuing to lower energy bills for American families.

So if Republicans were serious about wanting to make the grid reliable and resilient in the face of increasing power demand, they would stop their illogical attacks on energy efficiency with ridiculous bills like the Liberty and Laundry Act. And throughout this Congress Committee, Democrats have put forward ideas to expand the grid in smart and efficient ways. If Republicans really want to tackle increased electricity demand, then they will look at moving some of those bills authored by our Democratic members.

[The prepared statement of Mr. Pallone follows:]

**********COMMITTEE INSERT**********

*Mr. Pallone. So I look forward to today's discussion, and I yield back, Mr. Chairman, the balance of my time.

*Mr. Duncan. The gentleman yields back. That will conclude the members' opening statements. The chair would like to remind members that, pursuant to the committee rules, all members' opening statements will be made part of the record.

We want to thank all the witnesses for being here today and taking your time to testify before the subcommittee.

Each witness will have the opportunity to give an opening statement, followed by a round of questions from members. Due to votes, we are going to get through the opening statements, we will probably recess and go vote, and come back for the question portion.

But our witnesses today are Mr. Philip Dion, senior vice president of customer solutions at Edison Electric Institute; Mr. Tom Hassenboehler, chair of the advisory committee at Electricity Customer Alliance; Dr. Melissa Lott, professor at the Climate School, Columbia University; and the Honorable Tony Clark, senior adviser at Wilkinson, Barker, and Knauer, LLP.

So we appreciate you being here.

Mr. Dion, you are recognized for five minutes.

STATEMENT OF PHILIP J. DION, SR. VICE PRESIDENT, CUSTOMER SOLUTIONS, EDISON ELECTRIC INSTITUTE; TOM HASSENBOEHLER, CHAIR, ADVISORY COMMITTEE, ELECTRICITY CUSTOMER ALLIANCE; MELISSA C. LOTT, PROFESSOR, CLIMATE SCHOOL, COLUMBIA UNIVERSITY; AND TONY CLARK, SENIOR ADVISOR, WILKINSON BARKER KNAUER, LLP

STATEMENT OF PHILIP J. DION

*Mr. Dion. Thank you. Chairman Duncan, Ranking Member DeGette, and members of the subcommittee, thank you for the opportunity to testify today. As mentioned, my name is Phil Dion from the Edison Electric Institute.

EEI represents all U.S. investor-owned electric companies. Our members provide electricity to around 250 million Americans in every state of the union and the District of Columbia, and we support over seven million jobs in this great nation. We are here to talk today about the exciting advancements in artificial intelligence, and the steps we need to be taking as a country to ensure that we continue to be the top choice for companies to grow and

expand their businesses.

The growth of data centers and generative AI, combined with other things like the reshoring and manufacturing that is being driven in part by the --

*Mr. Duncan. Mr. Dion, could you pull that mike just a little closer?

*Mr. Dion. Sure.

*Mr. Duncan. Thank you.

*Mr. Dion. By the CHIPS and Science Act offers tremendous opportunities for the United States. Projections show that these activities are driving and will continue to drive significant growth in demand for electricity. So my remarks today will focus on the need to ensure that the critical infrastructure we need, including enhanced and expanded transmission infrastructure as well as generation, are built.

Look, we are all excited by innovation. We all recognize that innovation is something that outstrips regulations And in reality, it is moving far faster, particularly in the areas related to planning, siting, and permitting of our energy grid. So we need to take the

meaningful steps now to close this gap. Otherwise, we do risk leading our country's leadership and future technology leaders turning to other countries.

In 2023 the Federal Energy Regulatory Commission, they had the filings that showed what we all know: there is a nearly doubling of the five-year load forecast. And similarly, last year NERC noted that the electric peak demand and energy forecasts over their 10-year assessments were higher than at any point in the other previous decade.

While the -- there are many forecasts, and we know that, and the accuracy of those forecasts is a bit uncertain, the trend line is clear. Electricity demand for this country is poised to grow like we haven't seen for decades. Thus, our member companies are focused on the tools that we are going to need to meet the evolving customer demands.

The American investor-owned electric companies, they have the experience to meet this growth and the reliability needs that technology companies and data centers need. The regulated business model allows them to raise and deploy capital needed to enhance and expand the grid and enable this growth. In 2023 alone we estimate over -- or close to $168

billion was invested to make the energy grid smarter, stronger, more dynamic, cleaner, more secure. And $30 billion of that were to adapt, harden, and make it more resilient, especially on the transmission and distribution side.

However, as noted, it is still too difficult and time-consuming to develop and build the critical infrastructure that we need. The domestic deployment -- the -- excuse me, the deployment of these domestic projects is subject to a lot of Federal and state regulatory oversight and, quite frankly, some of these statutes have been used, really, for protracted litigation to delay the clean energy jobs, resources -- they add time and they add cost to these critical projects.

Look, we support environmental processes that are clear and transparent and efficient, and meeting all environmental requirements. But we do note that further reform is needed.

Resource adequacy is foundational for reliability, and that is core to our business. And it depends on the ability to design, plan, and build and operate the grid. This is going to require better system planning and collaboration with a lot of stakeholders.

There is a mention of FERC's recently-issued rule on electric transmission planning, and that is a good step. But there are other things we need to work on, including cost allocation and interregional planning. The need for additional grid capacity will only increase the demand for grid components. Prolonged shortages of this equipment can lead to delays for projects, impair our ability to recover from weather events, cyber, or physical events, as well.

Look, the grid is changing and expanding as it always has, because technology is evolving and customer needs and expectations are changing. Meeting those customer needs now and in the future affordably and reliably, that is what is the core of our business. That is what we have done for 100 years. And America's investor-owned electric companies are confident in our ability to meet the challenges. The regulated business model has proven that it can drive significant investments effectively in a way that keeps cost impacts to customers fair, but also provides benefits for all customers.

We are excited by the opportunities of data centers, AI, the new technology, and we look forward to working with this

committee and Congress to help meaningful reforms to ensure America can maintain its lead for the sectors that have potential to transform our economy.

I thank you again for this opportunity to testify, and I look forward to your questions.

[The prepared statement of Mr. Dion follows:]

**********COMMITTEE INSERT**********

*Mr. Duncan. The gentleman yields back. Mr. Hassenboehler, you are recognized for five minutes.

STATEMENT OF TOM HASSENBOEHLER

*Mr. Hassenboehler. Thank you, and good morning, Chairman Duncan, Ranking Member DeGette, Chairwoman McMorris Rodgers, Ranking Member Pallone, members of the subcommittee, thank you for the opportunity to provide testimony this morning. My name is Tom Hassenboehler. I am the co-founder and managing partner at COEFFICIENT. I also chair the advisory council for the Electricity Customer Alliance, and it is an honor to be back before this committee where I served in various capacities over the course of 15 years.

From where we stand today, our strained electricity grid infrastructure and our inability to expeditiously build new transmission and generation seems poised to undermine our ability to bring an American economic renaissance to bear. We stand to leave money on the table and undermine our national and economic security if the U.S. does not rise to meet this challenge. I would like to offer three points for this committee's consideration.

First, digital infrastructure and AI is underpinned by electric infrastructure. One does not exist or grow without

the other. AI presents an opportunity to expand the frontier of economic growth in the U.S. However, our success is not guaranteed.

Second, we are in a race to compete with our rivals, particularly China, on the development of homegrown American AI and electric infrastructure. Unlike when electric load was flat or declining, we need a national urgency to establish the electric infrastructure that can power an AI-enabled future.

Third, electric power regulation has become an obstacle, rather than an enabler of efficient and reliable operation of the grid and its necessary modernization. There must be a faster and more coherent way of addressing permitting and multi-state infrastructure development to enable this economic engine to grow and compete with our rivals, particularly China.

I will briefly unpack each of these a bit more.

Digital infrastructure is used to power the products that the industrial, commercial, and residential customers use to grow the economy. Goldman Sachs estimates that AI could increase global labor productivity by 1.4 percent and

increase GDP by seven percent. Utilities also use data centers and digital services, and the systems can all benefit from each other. At the core of AI functionality and advancement lies the physical infrastructure provided by data centers. Data centers are fundamental to our daily lives, from facilitating secure financial transactions to enabling the operations of vital public services. Data centers are not just technical facilities, they truly are pivotal and maintain the fabric of our digital economy.

The numerous economic benefits that AI offer will be determined by the strength of the electricity delivery system. While the continued headlines of AI-driven load growth get all the attention, the adequacy of electricity infrastructure to meet load growth from AI must be put in the broader context of all resurgent load growth. That is a good thing. Demand growth is resulting from a variety of factors, including the expansion of data centers, reshoring and resurgence of manufacturing, semiconductor fabrication, and transportation and building electrification. AI is the minority of total load growth, yet it shares the dependance on the electric grid system, as do all load growth drivers.

While we debate whether red states or blue states should pay for energy and transmission infrastructure, China is rapidly building transmission and developing its own AI capabilities. Twenty years ago Chinese energy consumption was a fraction of U.S. levels, and not much higher than Germany. Today China's primary energy and power consumption are larger than the U.S. and Germany combined. For example, in 2022 China spent over $165 billion on its electricity grids, while the U.S. spent less than 33 billion.

Policymakers should prioritize the perspectives of those leading the economic development resurgence and who will incur the consequences of reliability risks and rising costs, electricity customers, which brings me back to my third point. To meet this moment we need all stakeholders to be at the planning table with a much higher degree of transparency and a new paradigm of collaboration.

The Electricity Customer Alliance is a coalition focused on collaboration between commercial, industrial, and residential energy consumers. As part of its broader mission, ECA brings together trade associations, consumer advocates, and public interest groups to increase

transparency and accountability, specifically to ensure that customers are better able to participate and adapt to needs of a changing grid. We recognize that we cannot achieve this goal alone. Federal, state, and local governments, as well as utility partners all play a key role in promoting a vibrant, modern, competitive market for power generation and advanced energy services.

Policy solutions are not out of reach for this committee. They can be enabled, which can ensure the benefits from an AI-powered, digital economy are realized. Today's policies governing how we build electricity infrastructure are woefully inadequate to handle new growth reliably and cost effectively. Electricity customers stand ready to work with policymakers to develop solutions to better align economic and electric infrastructure development; to promote regional integration and more interconnected grids; to support clean, firm, baseload capacity; to modernize grid governance; to close regulatory gaps on local transmission planning; and to promote customer-centric solutions on reliability.

Thank you for the opportunity to appear before the

subcommittee. I look forward to answering your questions.

[The prepared statement of Mr. Hassenboehler follows:]

**********COMMITTEE INSERT**********

*Mr. Duncan. Thank you so much.

Dr. Lott, you are recognized for five minutes.

STATEMENT OF MELISSA C. LOTT

*Dr. Lott. Good morning, Chairman Duncan, Ranking Member DeGette, and members of the subcommittee. Thank you for inviting me to speak with you today.

My name is Melissa Lott, and I am a professor at the Climate School at Columbia University. I have worked as an energy systems engineer and researcher for more than 20 years across the United States, Europe, and Asia, and I have worked at agencies including the U.S. Department of Energy, the International Energy Agency, and the Asia Pacific Energy Research Center. In addition to my role at Columbia, I currently serve on the United Nations Council of Engineers for the Energy Transition, an independent advisory council to the UN Secretary General, and my full CV has been submitted separately to the subcommittee.

My testimony today is going to cover three broad topics. I will hit the high points, and the rest of it is in my written testimony. First, the current role of the electricity system and the potential impacts of all these emerging technologies and trends that we are seeing in

electricity demand in the United States. Second, I will cover the broad options that can be considered across the nation in order to have the electricity system be able to supply affordable, reliable, and increasingly clean electricity. Lastly, I will discuss the short set of actions that the Federal Government could consider to support a reliable and affordable electricity system in the face of this rising demand.

We know that electricity is already a vital part of the U.S. economy, and that role is expected to grow in part due to these major investments in manufacturing that we have already discussed this morning, as well as data centers, along with broader electrification trends. Today we see electricity accounting for just under a quarter of energy end uses, and we see it serve as a critical backbone to the economy. Net generation grew tenfold from 1952 to 2005 before it flattened out over the last two decades. And looking forward we see electricity demand poised for growth at higher rates than the country has seen in many decades. This is due to the number of factors we have already discussed this morning, including rising demand from data

centers and also industry, as well as the adoption of devices as electric vehicles and heat pumps.

As highlighted in the memo for today's hearing, the rapidly growing deployment of data centers to accommodate the increasing use of new, generative artificial intelligence platforms, GenAI, is driving up demand for electricity. But the investments that have made since the Inflation Reduction Act's passage in 2022 -- we have seen more than 200 new transportation and clean energy manufacturing facilities being announced. This represents over $100 billion in new investments, and these investments will be much more electricity-intensive than legacy factory designs, and are highly concentrated in three regions of the United States. That is the southeast, the Midcontinent Independent System Operator, or MISO, and the southwest.

Additionally, electrification is increasing for buildings and transportation. Overall, when we look at these trends, we see two impacts that influence the solutions that we can apply. The first is an increase in total demand. The second is impacts on peak demand for electricity, so the demand at a particular moment in time. Meeting this rapidly

rising demand will certainly require that we bring additional supply onto the bulk grid. However, the required amount of new supply can be reduced in a number of ways, as I discuss in my written testimony.

By simultaneously investing in the power grid, in non-wire solutions, and a diversified set of electricity generation technologies, the U.S. can meet demand while improving reliability, reducing emissions and other types of pollution, and also protecting affordability for consumers. Put another way, investing solely in additional energy supplies without also investing in the grid and non-wire solution will result in more expensive and/or less reliable electricity for consumers.

In particular, additional investments that have already been mentioned today, like interregional transmission, can reduce the cost of meeting increasing demand. But investment in non-wire solutions can also bring down peak demand, which lowers overall system costs and improves reliability.

Even without the anticipation of rapidly increasing electricity demand, the U.S. power grid is in need of modernization investments. The recent forecast for rapidly

increasing power demand make these investments even more urgent and necessary.

With regards to the power supply, each technology option comes with a set of trade-offs in terms of performance features and also risks. An analysis shows that a more robust, secure, and affordable system has a diverse mix of technologies, rather than depending heavily or too heavily on any one option.

While much of the U.S. regulatory framework for electricity is overseen by state legislatures and public utility or service commissions, the Federal Government has a significant role to play. Recent examples of leadership from Congress have included Back to the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007, the Energy Act of 2020, the Infrastructure Investment and Jobs Act, CHIPS and Science Act, and the Inflation Reduction Act.

And today Congress can continue to provide leadership. I highlight three ways in which I see them doing this, with additional details on my written testimony, including taking action to streamline rapid investment and transmission, as well as new energy supplies, requiring demand response and

non-wire solutions, and ensuring access to opportunities in historically disadvantaged communities, including many rural communities.

I would like to thank the subcommittee for holding this hearing. I look forward to the discussion. Thank you.

[The prepared statement of Dr. Lott follows:]

**********COMMITTEE INSERT**********

*Mr. Duncan. The gentlelady yields back. I will now recognize the Honorable Mr. Clark for five minutes.

STATEMENT OF TONY CLARK, SENIOR ADVISOR, WILKINSON BARKER KNAUER, LLP

*Mr. Clark. Thank you, Mr. Chairman, Ranking Member DeGette. It is good to be in front of your committee again today, and I appreciate the invitation to be with you. My name is Tony Clark. I am a senior advisor at the firm of Wilkinson, Barker, Knauer. Prior to that I served a term as a commissioner on the Federal Energy Regulatory Commission, and before that served for 12 years as a member of the North Dakota Public Service Commission.

The set of challenges and opportunities that you have teed up here today are really, in my mind, really the question for the electric industry over the next several years. You have the confluence of four big trends that are coming together all at the same time. You have the confluence of rapidly and sometimes unanticipated demand growth.

Layered on top of that, you have the retirement of significant forms of generation for a number of different reasons, some of them regulatory, some of them market, some

of them technological changes that have happened.

Number three, you have, in some way or another, a carbon-constrained future. Whether it is regulation, whether it is corporate buying practices, whether it is state-by-state policies, you will have some sort of carbon-constrained future.

And number four, you have no quick or easy solutions in the near term to meet that rapid demand growth. There are some exciting technologies, and I think the general trend line that people in the industry see between now and 2050 generally has shares of fairly common vision. But meeting that rapid demand growth over the next several years is a true challenge.

Now, you add on top of that the subject of this hearing, which is the voracious demand of AI-enabled data centers, and it makes that issue all the more challenging. And it is not to criticize those data centers. We need them here, from an American technological leadership standpoint, in terms of the global stage. But the challenge is how do we meet that demand?

So I talk in my testimony about some of the regulatory

and market challenges that are emerging from that confluence of four events. I highlight, for example, one really interesting solution that has come about in just the last year or so, which is existing nuclear plants effectively defecting from the grid just to serve that data center load. That raises a number of questions in terms of what it means for the rest of the customers that are on the system. There are questions that I think are appropriate for the committee and certainly for state regulators and Federal regulators.

What can be done to meet this near-term challenge that we have? I outline seven points that I think are worthy of consideration.

Number one is an appreciation that, in the electric industry, there is a great deal of variation on how utilities are regulated across the country, and the answer for one region may be somewhat different than the answer for another region.

Number two, the markets right now are increasingly -- FERC jurisdictional RTO markets are increasingly stretched to the breaking point. There are market reform efforts that should happen, and I would encourage FERC and the committee

to look at those market reforms so that we can see what is happening in the market that is driving generation to make the decisions that it is making with regard to either retirement or defection from the grid.

Points three and four both relate to how states and the Federal Government look at the subsidy and policy schemes that have been in place now over the last several years which can impact market operations and can impact what incentives there are for resources to be on the grid or not on the grid.

Number five, be very clear-eyed about the reliability assessments that are coming out of the nation's grid experts and engineers. There is almost not a week, or certainly not a month, where there is not some warning from the North American Electric Reliability Corporation or grid operators, all saying some variation of the same thing, which is this confluence of events is a big deal, and will eventually cause some sort of either cost or reliability issues if we are not able to get ahead of it. So trust the engineers who are talking about this.

Number six, look at meaningful permitting reform, and that means, in my opinion, meaningful permitting reform for

all forms of critical infrastructure, which includes electric transmission, but also includes natural gas and interstate natural gas infrastructure, which in many cases supports the renewable transition.

And then number seven, I put a pitch in for continuing congressional and Federal leadership in the area of nuclear energy. The Federal Government plays a very unique and central role as it relates to research and development, to nuclear power. And the ability to incorporate that into future grid planning will be extraordinarily important in meeting these challenges.

[The prepared statement of Mr. Clark follows:]

**********COMMITTEE INSERT**********

*Mr. Duncan. Thank you for that. We are going to move into the question-and-answer portion, at least for the ranking member and myself, so I recognize myself for five minutes for purpose of asking questions.

We are seeing unprecedented changes in both supply and demand in our electric grid. PJM is projecting 40 gigawatts in load growth and 40 gigawatts in retirements. That is a net change of 80 gigawatts. In PJM's own words, the math is not good.

On top of that, most of the currently planned electricity generation is from wind and solar, which cannot and does not run at maximum power nearly as long as sources like nuclear and natural gas and coal can.

Mr. Clark in your experience in the utility industry, have you ever seen changes at this scale and pace?

*Mr. Clark. Mr. Chairman, in the 25 years that I have been involved in it, no. The -- your point to 40 gigawatts of retirement, to put that in perspective, that would be something along the lines of the entire installed summer capacity of the entire State of New York that you are losing at a time that you have increasing demand.

I have talked to utility companies who have said when they are looking at their planning for the future here, they have new -- just data-centered demand seeking to be interconnected, which is equal to or in excess of their entire installed capacity of their system today. Now, will all of that come online? Probably not. But even if it is a small -- even if it is 50 percent or 25 percent of the projected increase, it is a lot, and will be something that utilities and regulators and Congress is going to want to be thinking about.

*Mr. Duncan. Thank you for that.

Mr. Dion, the challenges differ in traditional and vertically integrated states like South Carolina versus competitive wholesale regions like PJM. Which regions or market structures might be better suited to handle the scale and pace of the change we are talking about?

*Mr. Dion. Mr. Chairman, I think I would start with the RTOs and those areas. They were formed about two decades ago, and they had the different problems that they were solving for primarily efficiency and efficiency gains. So when you look at those regions, you have to look and talk

about maybe that some of the things that need to change out there are in and around their incomplete set of tools, right? They cannot direct construction generation, they cannot prevent generators from retiring or, as Commissioner Clark talked about, leaving the market, and they can't control how long it takes.

Additionally, they have hundreds of voting members and stakeholders. So I think one of the things that we have to talk about is to say, while it is important for folks to have a say in the process, it is worth considering, you know, are those stakeholder -- are those numbers just too large to manage?

In regards to the adequacy, you know, we have a long history in our business of working with communities, working with local governments, working with local constituents, and solving these problems. And so I think that in each of those situations, as Commissioner Clark mentioned, each of the regions are different. And so therefore, you have got to work with those local communities, you have got to work with those local regulators in order to get the generation and transmission sited that works best for that particular

region.

*Mr. Duncan. Yes, thank you for that.

As I said in my opening statement, we will not be able to meet the challenge of this demand growth unless we embrace an energy expansion. This means pipelines, natural gas, nuclear, and, of course, transmission lines.

Mr. Hassenboehler, you mentioned in your opening statement China's growth. But to my knowledge, China doesn't have to deal with NEPA, or the Endangered Species Act, or litigation slowdowns that are faced by both producers, transmission lines, pipelines, utilities, et cetera. So do you agree that we need to expand the size of our natural gas network by both adding pipelines and generation?

*Mr. Hassenboehler. Yes, Congress needs to make it easier to build all types of infrastructure that underpin the digital economy.

*Mr. Duncan. Thank you for that. Your testimony mentions innovative arrangements and structures for clean, firm baseload capacity. How can the electricity customers you work with help with the build-out of new nuclear to meet this new demand?

*Mr. Hassenboehler. Yes, this is really a great example of collaborative planning when you bring together utilities and customers, and the Federal Government really should explore ways to further look at these types of options, specifically large customers.

What is happening with the Duke Energy tariff is that it allows large customers to directly support carbon-free generation, like SMRs and advanced nuclear through innovative financing strategies and contributions that reduce project risk to lower the cost of emerging technologies. It is a voluntary program. It is -- so there are protections for ratepayers who are not involved and other customers who are not involved, but it is the type of innovation that is, frankly, going to be needed in all the different types of markets, both the regulated and the non-regulated states to allow these types of companies to come to the table to be part of -- an active part of the solution, and lowering costs, and bringing out this kind of technology.

*Mr. Duncan. Thank you for that.

I will say this. I was happy to see Secretary Granholm really embrace nuclear, talking about traditional light water

reactors, but those take decades in development and construction, just like we saw how long it took Plant Vogtle to actually come online and fruition. I am concerned about the minerals, the mining -- the need for copper for transmission lines. I believe we need more power generation in this country. We all like renewables, I am an all-of-the-above guy, but I also know growing demand needs to be met with more baseload, dispatchable generation. And we are going to do everything we can for that.

My time has expired. I will now go to the ranking member for five minutes.

*Ms. DeGette. Thank you, Mr. Chairman. I want to talk some more about the importance of long-term planning both for regional and interregional transmission lines, because that is the way the grid is going to get built out in an efficient way that is fair to consumers, but still generates massive benefits.

So Mr. Hassenboehler, welcome back. We are happy to see you on that -- even though you are on that side of the room today. I want to ask you, how important are good transmission planning practices for ensuring the grid is

built out in an efficient way?

*Mr. Hassenboehler. It couldn't be more critical in this environment right now. You know, this is obviously, you know, the hot topic of -- across the states, across the Federal.

You know, this -- the challenges of transmission development are not unlike any other types of infrastructure development. But as I said in my opening statement, digital infrastructure and AI is underpinned by electric infrastructure. One does not exist or grow without the other. So we really need to look at that national perspective here, and create that sense of urgency when it comes to planning lines that can better connect and help support economies of scale to supply the power that is needed across the country to feed this, not just from a regional, but from an international and a geopolitical perspective.

*Ms. DeGette. Can cost benefit frameworks be helpful in this?

*Mr. Hassenboehler. Absolutely, and cost benefit frameworks are part of the opportunity and the challenge that folks are looking at when it comes to regional planning and

how to move forward with the next steps from FERC's recent order.

*Ms. DeGette. Okay, so can you talk a little bit about what ECA views as some of the most important components of FERC's order 1920?

*Mr. Hassenboehler. Yes, I think FERC's order 1920 is a good first step, and there is a lot of challenges and implementation. Getting the implementation right is going to be a real challenge.

There is -- also remains existing issues around how to -- how do you deal with local transmission planning? You know, what has been happening around the country is because we don't have a macro-regional economic view of how to look at transmission at large, between regions and between inter-regions, we often get overbuild of local transmission projects that raise costs for customers and that potentially don't maximize the most efficient output of the system.

So this type of approach to encourage all planners to be at the table in a more concise and, frankly, uniform way across the country at least will help set the same types of assumptions that people are looking at when it comes to

linking economic development and the output of the system.

*Ms. DeGette. Yes.

*Mr. Hassenboehler. What is it trying to unlock?

*Ms. DeGette. Yes, I mean, one of the issues with order 1920 was it is only regional, and we really need to look at these interregional --

*Mr. Hassenboehler. Yes, and there are still more interregional needs there.

*Ms. DeGette. That is right.

Dr. Lott, I just want you -- to ask you if you can talk briefly about the importance of interregional transmission lines, especially with what Mr. Hassenboehler is talking about with the data center load growth that is so uneven nationally.

*Dr. Lott. When we look at these transmission lines that connect these different regions and also within regions, without building them up, the cost of meeting this increasing demand from data centers but all the other sources of new demand that we are seeing is higher if we don't invest in those numbers. And that is very clear in the analysis. I won't go so far as saying consensus, but that is what all of

us are seeing.

*Ms. DeGette. Okay. Can you talk about the importance of reforming interconnection processes to make sure we can bring as many generation and storage resources on the grid as quickly as possible to aid in the matching of supply and demand?

*Dr. Lott. At a high level, when we are building out our electricity system in all of our generation, we see the lowest cost, most reliable, and robust and secure system having three main buckets of technologies that are all in the interconnection queue and in our system in different ways. That is firm dispatchable power; variable renewables that have no fuel costs, so marginal costs; and energy storage. And so those interconnection queues, where we have projects waiting to play in the game and they can't, are really problematic. So the question is, how can we speed them up and get them through?

One of the big challenges we see there is workforce, and also the details and the complicated nature of a lot of those processes.

*Ms. DeGette. Great. Thank you.

Thank you. I yield back, Mr. Chairman.

*Mr. Duncan. Okay, the gentlelady yields back. The subcommittee will now recess for votes on the floor. We are going to try to reconvene 10 minutes after the last vote is called. So the subcommittee will stand in recess and we will be back.

[Recess.]

*Mr. Walberg. [Presiding] I call the committee back to order, and recognize for questioning for five minutes the chair of the full committee, Mrs. Rodgers from Washington State.

*The Chair. Thank you, Mr. Chairman.

The growth in demand for electricity for our information economy highlights the critical importance of affordable, reliable power for America's industrial and technological leadership. The scale of the potential growth in demand raises questions about what happens if we lock ourselves into policies that cannot rapidly respond to new energy needs, and restricts the supply of baseload power that is foundational to our ability to innovate and grow the economy. So I would like to start with Mr. Dion, Mr. Clark.

The committee has held several hearings examining the harmful impacts of policies that drive the retirement of baseload power without adequate replacement. If state and Federal policies do not adjust to preserve adequate baseload generation, will the growing demand for reliable energy add additional cost and strain to our grid?

And I will start with Mr. Dion.

*Mr. Dion. Thank you, Congresswoman. As you know, the core principles to our longstanding business are built on reliability and affordability. I will add safe and, certainly, cleaner. And we are committed to those two principles, and those principles have served us very well for 100 years, and we are -- we continue to work and have always worked with Members of Congress, this committee, and our state and local regulators to ensure that.

I think one of the things that is really important that we have talked a little bit about here today is planning, but it is not just planning and stakeholders. It is planning and planning and planning. For over 100 years, that is what we do. We continually plan and look to see what are the things that are out there, what are the things that are happening,

and how can we meet the demands of our customers?

One of the things that we do think about, especially as demand growth has increased -- and we haven't seen this, as I said, in a couple of decades -- is how are we going to have those new methods of clean, dispatchable energy in order to meet that load? And they -- those clean, dispatchable energy resources -- and, quite frankly, any resource -- has to be commercially viable, it has to work, and it has to be economically reasonable. It has to be affordable. So those are the things that we are committed to working on.

*The Chair. Right.

*Mr. Dion. And those are the things that we are looking towards --

*The Chair. Good.

*Mr. Dion. -- not only this government, but also our technology partners, quite frankly, some of our larger customers to help us work on things like advanced nuclear --

*The Chair. Great, great.

*Mr. Dion. -- carbon sequestration, long duration storage. We need those technologies to come to fruition.

*The Chair. Yes.

*Mr. Dion. Quickly.

*The Chair. Thank you. Thank you. And we need it quickly, otherwise we are going to have -- we will not have reliable, and it will not be affordable.

Mr. Clark, is there anything you want to add?

*Mr. Clark. I would concur with that. How much it will cost is all very much dependent on how we get there, and regulation and policy is going to have to adapt to that.

I would urge the committee to listen to those RTOs, listen to NERC, listen to the experts who are saying give us time. This is an issue, this confluence of retirements and rapid demand growth. So one, have the time to be able to do it reasonably. And then also, lean into those studies which pretty consistently show that the most affordable way to achieve that kind of transition is with a full portfolio of different resources, not focusing in on any specific one.

*The Chair. Thank you.

Mr. Hassenboehler, welcome back to the committee, and I appreciate your good work on the committee through the years on our side of the aisle. Now many of the companies you represent need massive amounts of power around the clock in

order to operate process digital information, yet these companies have been quiet as the EPA seeks to restrict state decisions and drive premature retirements.

What should industries reliant upon reliable power supply, like the tech sector, be doing to help inform policies and to support the expansion of reliable power generation in our country?

*Mr. Hassenboehler. Thank you for the question, Madam Chairman. And it is true, tech companies, as well as other commercial industrial companies and utilities, do all have clean energy goals.

As the nation is looking for -- to meet demand for more clean, firm baseload power, the reality is that parts of the grid continue to be fueled by natural gas and other fossil fuels. We should be focused on collaboration to make sure affordability and reliability is prioritized in the electricity system and, frankly, between customer classes, so that we all know how to build and collaborate together on addressing these challenges to make sure affordability and reliability continues to be prioritized in the delivery of the electricity system.

*The Chair. Thank you. So what happens if electrical power is too expensive or unreliable in the U.S.?

*Mr. Hassenboehler. Offshoring and jobs. Jobs get lost and China builds it. If we don't build it here, we are -- China is already. As I mentioned in the testimony, we are in a race to compete with our rivals on this topic. You know, they have priorities to lead on AI growth by 2030. They are building out transmission infrastructure at a more rapid pace than we are.

That is the lifeblood of the digital economy. We need to really treat this issue with a little more of a national urgency -- well, not a little, but a lot more of a national urgency to make sure we are able to deliver on the promise of the new AI economy.

*The Chair. Yes. Well, thank you. Yes, it is very clear there is some warnings, and we need to respond to them to make sure that we have affordable, reliable electricity.

I yield back.

*Mr. Walberg. The gentlelady yields back, and now I recognize the gentleman from New Jersey, the ranking member of the full committee, Mr. Pallone.

*Mr. Pallone. Thank you, Mr. Chairman. We need to rapidly interconnect more resources to the grid as quickly as possible, but I want to discuss other important elements to maintaining grid stability while power demand increases, particularly energy efficiency and demand flexibility.

Unfortunately, committee Republicans have spent much of their time in the last two years attacking every element of energy efficiency. And these extreme attacks, I think, are illogical. After all, energy efficiency reduces energy consumption and lowers energy bills for American families. So let me ask Dr. Lott.

Can you talk about the importance of energy efficiency and balancing the grid during times of increasing power demand?

And you can talk specifically, I hope, about the importance of encouraging energy efficiency at the data centers that will be driving a large part of this demand growth over the next few years, if you would.

*Dr. Lott. Thank you very much for the question.

So energy efficiency helps us to keep the price of electricity low, but also -- which is very important to end

consumers -- the bill that is actually delivered low. So around the country I will highlight that we have one in three Americans who is currently energy insecure, they struggle to pay their energy bills, and energy efficiency is a key part of that. They often live in lower-quality housing, where they may have 900 or 1,000 feet and use more electricity than someone living in a three times the size home. So it is an important aspect there.

When it comes to energy efficiency within data centers, there are a lot of things that data centers can do to reduce their load and also to allow themselves to be flexible. And so by requiring that, by having that be part of the equation, we can decrease not just the total amount of energy needed, but also the peak demand. I will give a specific example. By having more efficient cooling in these centers, we won't aggravate a summer peak in an already hot part of the country.

*Mr. Pallone. Well, thank you. It is also important that we ensure that the grid has sufficient generation resources to meet demand at its highest point, and there is a lot of value in shifting from times of high demand to almost

any other time.

So let me ask you, Dr. Lott, can you talk about the importance of ensuring that the new, large loads coming onto the grid have the ability to have some flexibility with their demand profile?

*Dr. Lott. Yes, anything we can do to decrease peak is probably a good idea. Incentivizing that helps keep the entire cost of the system low.

So I mentioned in my testimony that by increasing utilization rates of individual types of generation, we will -- and having a less swingy demand profile, we will end up saving consumers money. We will bring down bills, and that is good for everyone. So when we have these big sources of demand, individual data centers, individual companies, new groups of them, anything they can do to be able to be incentivized to be flexible is good because it brings down that peak. Peak is a challenge.

*Mr. Pallone. All right, thanks.

Now I have got to ask Mr. Hassenboehler -- I didn't realize, Tom, that your name was so interesting. Hassenboehler.

Can you discuss the perspective of the Electricity Customer Alliance's members on demand flexibility for large loads?

*Mr. Hassenboehler. Thank you for the question, Chairman, Ranking Member Pallone, and it is good to be back again.

Flexible demand is critically important for this -- for the country, especially as load is growing. Not all load is the same. You know, many folks need power 24/7, some are able to be more flexible in how they optimize it to meet the peaks, as Dr. Lott was saying. I think, you know, the committee has an opportunity before us to identify and look at barriers to promoting more flexible demand across the country.

You know, these are challenging issues. They deal with FERC, NERC, balancing authorities, state regulators. You know, this committee does have the ability to convene those types of folks to try to provide recommendations on what we do to prevent things like implementing curtailment orders. No one wants blackouts. We really want to look at more surgical power cut-offs and making more voluntary

curtailments the norm through market changes.

All of these things are being -- playing out in different ways across the country, and the committee has an opportunity to prioritize that in a time of load growth because the customers who are driving the load growth really do want to be an active part of the solution. And that demand side, to activate that demand side more, is a critical missing component often in the discussions here.

*Mr. Pallone. All right, thanks a lot. I don't know if I have time for one more. Let me ask Dr. Lott.

While current power demand growth expectations are powered by the growth of data centers and AI, the long-term trend of vehicle and building electrification over the next 25 years will have an even more outsized impact on demand growth. Is that correct?

*Dr. Lott. That is correct.

*Mr. Pallone. All right. Because, I mean, there has been a lot of folks today, with good reason, on what data centers and artificial intelligence technologies mean for the grid. But I just want to highlight that, regardless of the future of AI, increases in building electrification and

electric vehicle adoption are going to mean that growth in power demand is here to stay, and that we need to make sure that we can meet that demand.

So thank you, and I yield back, Mr. Chairman.

*Mr. Duncan. The gentleman yields back. I will now go to Mr. Latta from Ohio for five minutes.

*Mr. Latta. Well, thanks, Mr. Chairman, and thanks for our witnesses for being with us today. I am going to make a kind of a general statement.

I don't think there is anybody on our panel of witnesses today that doesn't believe that we have to have more power in this country. Is there anybody who doesn't believe that? I usually go down the line. So I am going to save a little bit of time there.

You know, you can go back in time. It hasn't been all that long ago we didn't have electricity like we have it today. I know my mom, growing up on the family farm, she was 15 or 16 before they had electricity. And I look at my district today, I have 86,000 manufacturing jobs. I have the largest farm income-producing district in the State of Ohio. And I don't say I need energy, I need affordable energy

because I have to be able to compete with all of the businesses that are out there.

And I know the chairman has already mentioned it earlier about PJM, you know, predicting the growth right now of 2.4 percent from 2024 to 2034, every year a 2.4 percent so get a 24 percent increase right there that we are going to have to have.

And so it comes down to how we are going to come up with this energy, and how we are going to do it. Because again, we had a polar vortex in the Midwest in 2014. Every power generation station in the State of Ohio was at peak. We did not have a blackout. We didn't have a brownout. I have recently asked PJM if we could sustain that same situation. Maybe, maybe into 2026. So we are in a critical situation out there.

Mr. Clark, if I could start my questions with you because, I tell you, your four points that you made in your initial statement, you know, the number one was the unanticipated near rapid demand growth. It is the first word, "unanticipated.'' What happened? Why aren't we anticipating this rapid growth that we have to have in this

country to make sure that we can sustain that electrical grid that we have to have?

*Mr. Clark. I think for -- Mr. Chairman and Congressman Latta, for some period of time there has been discussion about the potential for growth. And we have seen electrification, electrification of transport, things like that. And so there is some knowledge that something is coming somewhere out there in the future. With the especially data campuses that are now looking to site, that growth is right in front of the faces of the grid planners and the utilities that serve them. Because for those data centers, they are coming to the -- those utilities right now and saying, "How fast can you get us online?'' It is all about speed to market.

So what was thought about in kind of a general sense is now absolutely right in front of us in terms of --

*Mr. Latta. Well, let me follow up with this, because again, in your testimony you are talking about the collocations with the companies. And one of the questions out there right off the bat is, who do they want to collocate next to, and what type of a source -- of energy source is it?

Is it -- is that source going to be there in a few years down the road, or is it going to disappear?

*Mr. Clark. Mr. Chairman, Congressman, the collocation strategy that has developed here just recently -- I mean within the last year you really starting to see crop up -- is data centers collocating with an existing nuclear unit. And so what will happen under those arrangements is the data center and the nuclear unit will strike a PPA, a Power Purchase Agreement, and they will -- effectively, a portion of that capacity is taken off of the grid and goes directly towards serving that particular load.

In my testimony I talk about the economic drivers behind that. But both of those parties are making an economically rational choice, but it is going to have some sort of impact on other customers on the grid if you are taking huge chunks of capacity off. And I would urge especially state regulators who have oversight over retail sales to consider what that impact is, and how the public interest --

*Mr. Latta. And that is why it is absolutely essential that we are also making sure that we have that source of power to make -- out there for the companies.

Mr. Dion, if I could turn my questions to you, in your statement, you know, when you were talking about the critical infrastructure that we are going to have to have, and you say it is the less discussed out there, but it is absolutely essential that we have, and it is one of the things out there, and we are also talking about permitting and how we are going to get to that point, and we are talking about seven to ten years to get something moving in this country, you know, what is your forecast for the future? Is it bright, grim, or what do you think?

*Mr. Dion. Mr. Chairman, Congressman, I am always bright on the United States and our ability to solve issues.

I think what you have you have hit on is a little bit of what you were talking with Commissioner Clark about. I think we have become accustomed, especially in the last two decades -- we are a little bit of victims of our own success, right? The load has been flat, but that doesn't mean that electricity usage hasn't been growing. It has been growing, and we have been using the system as we should. It has become incredibly efficient.

The problem is that we have essentially two decades and

people, quite frankly, like myself, who started as an ALJ 25 years ago who has never seen this type of growth. And so we have a situation where we have people who are -- have never seen this type of growth. And when growth has been brought up before, this catastrophic growth, the Internet of Things, a lot of things that are going to take a lot of electricity and a lot of things that are going to be very bad for the grid, those things never materialized.

The difference, Congressman, today, though, is this is a step change. And I think we all need to recognize that. And that is the thing that we need to do, is we need to begin working, starting with our local commissions all the way up through to this committee, to say don't let the past fool you. There is a step change, and we do need to be making these infrastructure investments, and we need to get these things sited and permitted quickly. We do not have the time that we used to have, even though we did a really good job.

*Mr. Latta. Thank you.

My time has expired, Mr. Chairman, and I yield back.

*Mr. Duncan. [Presiding] The gentleman yields back. I now go to my friend from California, Mr. Scott Peters, for

five minutes.

*Mr. Peters. Mr. Chairman, thank you so much for this hearing. It is a sign that the committee is really getting serious about the energy grid and reliability issues that are facing this country, and it is really welcome. So thank you.

Today data centers alone account for approximately four percent of total electricity consumption, equivalent to 14 million households, and this demand is expected to triple by 2030, which would be the equivalent to the annual usage of 40 million households.

The North American Reliability -- Electric Reliability Corporation, NERC, the entity that is responsible for telling us how to keep the lights on, has warned us about the potential harm extreme weather and other threats could pose to the bulk power system. They have said explicitly that a reliable grid will require significant planning and development of the interconnected transmission system.

We hear a lot from my friends on the other side of the aisle about generation, and they may be surprised to know that I agree with them more than I disagree that we maybe have retired assets too early, but generation is really not

the problem right now. We have thousands of gigawatts of new generation, both fossil and clean, that are lined up, waiting to get connected to the system. The grid, though, is old, the grid is dumb, and the grid is small. And under the status quo we will fail to meet our energy demand, secure the grid against our threats, and connect much-needed generation to the communities that need it.

Every day we waste is a day our competitors gain an advantage. So we need to pass meaningful permitting reform. For example, we can seriously accelerate the construction of clean energy by streamlining development on disturbed or non-sensitive areas like brownfields. We understand the environmental impacts of clean technologies. We should identify suitable areas, collectively study the impact of certain technologies on these areas, provide necessary approvals, and start building.

We need to give FERC the congressional backing it needs to do bold, interregional transmission planning reform, which my BIG WIRES Act would do. Also, the Speed and Reliability Act that I have introduced would also expedite the construction of critical interregional lines. We need to

thoughtfully streamline the judicial review process, while encouraging meaningful community engagement so that communities, developers, and petitioners aren't in limbo for years. An applicant comes, wants a yes answer, but the applicant doesn't want to be in limbo forever. No is the second-best answer. We need certainty. We need a process that is not unreliable and inefficient.

The senior Senator from Louisiana, Bill Cassidy, said at a recent Senate hearing on this very issue, "I like to say that folks on the other side of the dais want power lines and the folks on this side want pipelines, but we really want both, and we know that both are essential. American businesses also agree.''

I ask unanimous consent to enter into the letter -- enter into the record four letters from American businesses, trade associations, and customers that were sent to the Energy -- Senate Energy Committee urging Congress to meaningfully talk about the grid, permitting reform, and how we might meet growing energy demand.

*Mr. Duncan. Without objection, so ordered.

[The information follows:]

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*Mr. Peters. Mr. Hassenboehler, the letter from the Clean Energy Buyers Alliance says, "Right now, outdated Federal permitting policies and aging grid infrastructure are standing in the way of new investments in the U.S. economy.'' Your own organization, ECA, said in their letter, "The U.S. electric grid is not prepared for this significant load growth.'' Does the time it takes to connect facilities to the grid affect where your members choose to build new facilities?

And in your experience, is this just a grid issue, a generation issue, or a combination of both?

*Mr. Hassenboehler. Thank you for the question, and it is -- the answer is yes to all of it. It is a complete issue for all three.

I mean, the economic drivers who rely on access to electricity are going to go to the places where there are areas of efficient permitting, where there are areas of easy interconnection, which is a huge challenge, as you mentioned, and, frankly, where there are areas where they have markets to drive innovation and allow that possibility to help support their growing operations.

And so we need all of those things to work better in this country, and we need to make it a national priority to compete with China.

*Mr. Peters. I know that for EEI interregional transmission presents a lot of challenges. But let me ask you again, Mr. Hassenboehler, what are the benefits of interregional transmission connections? That would be a net benefit for your businesses?

*Mr. Hassenboehler. Sure. Any time you try to broaden the scope of the grid to allow more efficiency of dispatch and to be able to share reserves across a broader geographic region, including multiple geographic regions, especially in times of, you know, severe weather threats and other types of challenges that we all have to face, it is -- we view it as a good thing. And so we need to be competitive in that, and have a frank conversation to bring everybody to the table to not only look at the benefits of regional, but also interregional transmission planning.

*Mr. Peters. And Ms. Lott, it is clear that significant investments in the grid can provide data centers with increased access to reliable, often clean power. Can you

describe in 12 seconds what some of the barriers are?

Maybe I will ask you to actually provide the answer in writing, but I appreciate you being here. And I want to know what the common problems are with pipelines and with electric lines, and we will ask that question for the record. Thank you.

[The information follows:]

**********COMMITTEE INSERT**********

*Mr. Duncan. The gentleman yields back.

*Mr. Peters. I yield back.

*Mr. Duncan. And I now go to Mr. Walberg from Michigan for five minutes.

*Mr. Walberg. Thank you, Mr. Chairman, and thanks to the panel for being here today.

Like the space race of the 20th century, we are now in a race against China to be the leaders in data, AI, quantum computing, and more. Whoever has the greatest computing power will win. And more computing will require more energy. I have faith in our American technology companies to outstrip the competition, but we must have the energy infrastructure to support this demand growth while still ensuring reliable, affordable power for our constituents. And in my opinion, the best way to do this is through a diverse generation mix, a robust and secure grid, and increased coordination across the board.

So Mr. Hassenboehler, tech companies have said that they have goals of going 100 percent clean in the near future. And subsequently, the interconnection between queues in the U.S. are predominantly wind and solar. But we know from

experience that, at best, only 10 to 20 percent of the projects that enter the queue actually get built because they just aren't viable, especially for data centers who need consistent levels of power throughout the year.

So if we want to go clean, my question is, why try to rely on technologies that are offline more often than they produce, instead of encouraging tech and large industrial companies to work to develop additional nuclear capacity in the United States, which is clean energy as well?

*Mr. Hassenboehler. Thank you for the question, and it is true, tech companies do have -- and commercial and industrial companies have -- clean energy goals. But as the nation, as you acknowledge, is looking to meet demand, growing demand in a reliable, affordable way, and as the country is trying to transition to more clean, firm baseload power, all stakeholders need to be at the table.

What is happening now is a change. There is an innovation happening with bringing more collaboration to the table to help -- have -- so customers can have an output and a say in some of the new firm, dispatchable resources that need to do it, and so they can share in the technology

innovation, the cost, and the opportunity. And so we are seeing that play out in different ways in the country right now. And it is, frankly, critical to get everybody at the table right now to really think about those issues in a more comprehensive --

*Mr. Walberg. And speaking truth, in fact, you know, pushing back to some degree and saying, listen, we are not going to be buffaloed into moving forward with something that won't achieve the results we need.

*Mr. Hassenboehler. Yes. When competition with China is on the table to drive this AI load growth and all this other load growth that is coming back onto the system, we really need to think about it as critical infrastructure broadly and much more of a national urgency to deal with these issues.

*Mr. Walberg. And they are at the point of winning because they are willing to do anything to achieve that, and we don't have to. We can do the right things.

Mr. Dion, China has committed to become the world's leading AI power by 2030, and is laying the groundwork to accomplish this through massive investment in their

electricity infrastructure. For example, as of last year China had 30 gigawatts of nuclear capacity under construction, and another 200 gigawatts of proposed and planned capacity in the pipeline, more than double current U.S. nuclear capacity of 94 gigawatts. China is spending more on electricity grids than all other countries combined.

How can the U.S. build out electricity grid capacity to compete with China on AI, and ensure that AI computing stays in the United States?

*Mr. Dion. And Chairman, Congressman, thank you very much for your question. We are the leader now, and we need to remain the leader. That is that is first and foremost.

*Mr. Walberg. By the skin of our teeth.

*Mr. Dion. And the most important thing for us to all concentrate on is a little bit of what this panel has been talking about. It is that collaborative effort.

So one of the things that we talked about a little bit earlier was how did this happen, and why did this catch us by surprise? I think part of the reason is that, when we are all talking about the various things that are important to us, we need to come together and talk about the things that

are important to us as a nation, as well. And this is a national security issue.

The other thing that I would highlight very quickly with my time is the supply chain issues. We talk about beating China with our energy infrastructure, and we need to build more data centers, we need to do all those things, and we are with you on all of those things. But when the parts come from China too, that is a critical issue. We need your help and your leadership. We already have supply chain delays -- I want to thank Representative Hudson and Chair McMorris Rodgers for their work, but we have supply chain delays, and those are going to continue.

Not only that, we are going to continue to cede that ground to China. That has to stop. The manufacturing has got to come back for our critical energy projects.

*Mr. Walberg. Yes, those aren't sexy issues. They are reality. We have got to have those.

*Mr. Dion. It is part of being with the utility business.

*Mr. Walberg. Absolutely. Okay, my time has expired.

I yield back.

*Mr. Duncan. The gentleman yields back. I will now go to Ms. Matsui for five minutes.

*Ms. Matsui. Thank you very much, Mr. Chairman.

And thank you, witnesses, for being here today. And a special welcome to Dr. Lott, who has a degree from UC Davis, which is part of my district.

As each of you have highlighted in your testimony, there are many reasons to expect electricity demand to increase over the coming years not only from data centers, but also from manufacturing and electrification. There are over 1,480 gigawatts of clean, zero-carbon power waiting in interconnection queues right now, and there is simply no excuse. We can and we must meet new demand for clean power sources.

Dr. Lott, all things being equal, which is faster to build, a gas peaker plant or solar with battery storage?

*Dr. Lott. Probably solar.

*Ms. Matsui. Okay. Dr. Lott, all things being equal, which is cheaper over the lifetime of the project, a gas peaker plant -- I already asked that question.

Who ultimately pays for a new power plant?

*Dr. Lott. Consumers.

*Ms. Matsui. Okay. As we move forward a cleaner grid, are you concerned that some utilities that aren't planning for decarbonization will end up with expensive, stranded fossil fuel assets?

*Dr. Lott. Organizations that aren't including different commitments that have been made from states, from local communities, and also from the businesses that Mr. Hassenboehler highlighted earlier could end up in a situation where those assets that they invest in are not going to be able to be utilized for a very long time. At the end of the day, they have to be paid for, and that could have negative affected issues on consumers.

*Ms. Matsui. Okay, thank you. Ultimately, this hearing is about how to decarbonize the grid. There is a pervasive belief that we cannot provide affordable, reliable electricity with zero carbon sources. And yet critics of clean energy have consistently underestimated the clean energy transition.

In California we added 10 gigawatts of battery storage in the last five years alone. Two years ago it was a major

achievement when California's renewable energy generation exceeded total demand for a few minutes. Now, this spring, renewables exceeded demand in California nearly every day for over a month.

Dr. Lott, in light of this incredible progress toward a clean grid, is it possible to decarbonize the grid while still meeting rising demand?

*Dr. Lott. Yes, the analysis is very clear on this. We can create an affordable, reliable, and clean electricity system. It requires that we use three broad buckets of technologies. There are many individual technologies in each bucket. The first is zero marginal cost variable renewables. The second is energy storage, batteries, and other types of storage. The third is firm dispatchable power. Together they play like a team, and they can get us to zero carbon.

*Ms. Matsui. So we can meet rising electricity demand and still meet the requirements of the EPA power plant carbon pollution rules?

*Dr. Lott. Yes, we can.

*Ms. Matsui. Okay. We need to think more creatively about grid capacity. Aside from efficiency improvements,

there is an opportunity to shift demand to off-peak hours using backup power systems or battery storage. Certain data center operations, like training AI models, could also be shifted to off-peak hours.

Mr. Hassenboehler, as we work to meet increasing energy demand, do you see a role for voluntary market mechanisms that incentivize reducing or shifting demand?

*Mr. Hassenboehler. Short answer: absolutely. While every facility configuration is different, so it may not work in every case, we need every tool in the toolbox to look at that. And of course, customers want to be a more active part of the solution here. And incentivizing voluntary action and voluntary market incentives --

*Ms. Matsui. Right.

*Mr. Hassenboehler. -- you know, to help reward the active side of the load for turning their loads off at the right times of the day needs to be part of a bigger conversation about how to --

*Ms. Matsui. Could you find this an area where the committee can find bipartisan consensus?

*Mr. Hassenboehler. I do hope so. I hope, especially

as the new drivers of the AI growth are trying to be more active into the conversation, they are engaging in every forum --

*Ms. Matsui. Okay.

*Mr. Hassenboehler. -- and so there is no reason why on this committee this forum also shouldn't be a part of that discussion.

*Ms. Matsui. Thank you. Even if data centers don't become more efficient, AI could help make many other systems more efficient, which could, in turn, offset some of the increased electricity demand from data centers. For example, AI can help optimize the electric grid, assisting with forecasting, reducing congestion, and operating distributed energy resources.

Dr. Lott, can you talk more about how AI could help make the grid more efficient in 20 seconds?

*Dr. Lott. AI can help, across the board, supply all of the transmission and distribution systems and demand. In the next five seconds I will just say -- is that I think we will be able to do this more quickly than we may be projecting it now if we are able to incorporate AI more effectively into

our systems and take advantage of this.

*Ms. Matsui. Okay. Thank you very much.

And I yield back the balance of my time.

*Mr. Duncan. The gentlelady yields back. I will now go to Mrs. Lesko from Arizona for five minutes.

*Mrs. Lesko. Thank you, Mr. Chairman.

Mr. Dion, in Maricopa County, Arizona, which is the greater Phoenix metropolitan area, it is growing rapidly. In my congressional district they are building the Taiwan Semiconductor Manufacturing plant. Intel has expansion. We have Department of Defense-related industries. We have tons of data centers coming. And my question is, Maricopa County in Arizona finds itself in a unique, if not untenable, position.

As I mentioned, we are experiencing rapid growth. On the other hand, Maricopa County's ability to support these industries is being constrained by the Biden Administration's environmental policies, namely designation of the county as in non-attainment with the EPA ozone standards based on unrealistic measures for that area of the country, which is a desert.

So my question is, can you explain to me how the Biden Administration's EPA and regulatory policies are adversely affecting the U.S. growth in AI and the manufacturing industry?

*Mr. Dion. Chairman, Congressman, thank you for the question.

As my home state, I always believe -- I grew up -- that Arizona is in a unique position, and it is certainly blessed with a lot of great attributes, including space, power generation, and wonderful constituents.

I think the biggest thing that you are pointing out is the need for coordination in and amongst Federal agencies. Each agency is certainly an expertise in each of their areas, but they -- one shouldn't and can't override the other. For a long time in our history, when I talk about reliable, safe, and affordable and cleaner, it is balancing competing interests. That is what we do, all the way down from county supervisors up through commissions through the Congress. And that would be a welcome addition to this particular energy universe that we find ourselves in.

And the reason I say that is any coordination that we

could have to ensure more certainty ultimately enures to the benefits of all of our customers. It de-risks what we should do and what we can do, and that is going to make the stable environment that our customers love, that our markets love, and, quite frankly, that we need to make this energy future happen.

*Mrs. Lesko. Thank you, sir.

My next question is for you, Mr. Clark. Data centers are rapidly expanding, not only in the metropolitan Phoenix area, but in rural areas, where land is less expensive and there is access to existing transmission and distribution infrastructure. What are the challenges faced by electric co-ops to provide the energy needs for this expansion?

*Mr. Clark. Mr. Chairman and Congresswoman, thank you for the question. So co-ops would face many of the same challenges that an investor-owned utility would face, which is rapidly increasing demand and attempting to meet it. So they are facing a lot of the same pressures.

With an electric co-op they have a different structure, so it is member owned, and they are going to need to pay particular attention to what is this impact on the existing

members of the system, ensuring that there aren't cross-subsidies and that it is a system that, on the whole, can be afforded by all.

*Mrs. Lesko. Thank you very much.

And Mr. Dion, I am going back to you. China does not have radical environmentalists telling the Communist Party of China what to do. China will likely have no qualms about powering their AI data centers using reliable and abundant coal. They currently have the largest coal fleet in the world by a factor of five. Isn't it likely that if they see an opportunity to advance past the United States in AI data centers, they will use coal power to do so?

*Mr. Dion. Thank you, Congresswoman. It is always unpredictable what China will do, but I think surpassing the United States is something that we can all agree on is top of their list, and that is why I made my earlier statement, and some of the members talked about it: We need the clean, firm, dispatchable power.

But again, I want to be very clear about what I mean by that. I don't mean at all costs. That is not what I am saying. And we can't use things that are just commercially

unproven. So we do have some time. Not a lot, but we do have time. And the more time that we have, the better our answers are going to be. But we need to work together. This Congress, the DoE, the national labs, we have got to solve this flexible, reliable carbon -- lower carbon future together. Otherwise, that is top of China's list.

*Mrs. Lesko. And I agree with you. I think we need an all -- everything-and-above energy policy. Use all energy sources.

And with that I yield back.

*Mr. Duncan. The gentlelady yields back. I will now go to Mr. Cardenas for five minutes.

*Mr. Cardenas. Thank you very much, Mr. Chairman, and also to the ranking member for having this very important hearing. And I appreciate the witnesses being here, sharing your opinions and your expertise with us today in front of the American public.

It is undeniable that our nation is set to witness a surge in electricity demand and, as a result, increase strain on the grid. This is most certainly a challenge that we need to address. But a challenge in the 21st century must be met

with 21st century solutions. That is why I am concerned by the rhetoric I have heard from some of my colleagues on the other side of the aisle which suggests the solution is to keep Americans dependent on deadly fossil fuels like coal.

Going backwards and increasing our reliance on energy sources like coal is not only costly, but disastrous for our communities and also for the future of the planet. As a reminder, when coal is burned it releases several airborne toxins, including but not limited to mercury, lead, sulfur dioxide, nitrogen oxides, and particulates. It similarly releases waste like waste into lakes, rivers, and waterways, which contaminates drinking water supplies and the overall health and well-being of people and everyone else on the planet.

Dr. Lott, can you please discuss the health and environmental impacts of keeping coal plants online, as well as the long-term costs associated with those kinds of impacts?

*Dr. Lott. Thank you so much for the question.

When it comes to the impacts of coal, you highlighted many of them, so impacts on our air and our water. These

have impacts on our lives and our health from before we are actually born. That is what the evidence tells us. And so the cost over a lifetime are huge.

Evidence shows that if I had been born in a part of this country just to the south of where I actually grew up on a military base, my life statistically would be about 14 years shorter because of pollution --

*Mr. Cardenas. Wow.

*Dr. Lott. -- from coal-fired power plants, from transportation, and industry, and a few other sources. So these effects are real, and we have a lot of evidence around the impacts of them. We see tens of thousands of Americans being affected and dying from this pollution.

Overall, those costs are huge. The problem is that we pay from them from different buckets. We pay our power bills with one bucket and we pay our health bills with another.

*Mr. Cardenas. So basically, what you just outlined is that if we choose to be open minded and keep our eyes open, we can actually quantify the cause and effect, not just the cost of a certain electric bill.

*Dr. Lott. Yes. So we have extensive research done by

hundreds of people over many, many decades that can link this cause and effect.

*Mr. Cardenas. Thank you so much.

Ultimately, the cost of inaction is far greater than the cost of addressing the contributing factors of climate change. The Biden Administration has recognized this, and has not only invested in supporting our nation's grid infrastructure, but has worked to put more clean electricity on the grid. For instance, last year FERC finalized order 2023, which constituted a series of reforms such as to reduce backlogs for projects seeking to connect to the transmission system, improve certainty in the interconnection processes, and ensure access to the transmission system for new technologies.

Can you expand, Dr. Lott? Can you expand on how this final rule speeding up interconnection queue processing will help put more clean electricity on the grid, and potentially phase out polluting sources like coal?

*Dr. Lott. Thank you for the question. We have so many technologies that are ready to go today, to the points that were brought up by members of this panel here, to get viable,

commercially viable technologies onto the system, technologies that can lower the cost of power to consumers. By speeding up getting to an answer when it comes to these applicants through the queue, we can get those technologies online faster, which can help us to not just meet rising demand, but also to phase out inefficient, polluting power plants.

*Mr. Cardenas. Are you -- in your answers, when it comes to actually literally cleaning up our act, should we be moving to a sole-source type of source of electricity, or is there room and a right way to do it in having more than one source?

*Dr. Lott. The analysis is really clear on the point that we want a diverse set of technologies. They need certain characteristics to get us to the affordable, reliable, secure system we are looking for, but every single technology has a risk. Every single one of them has a trade-off. And so by having that diverse mix, we end up having a system that can supply what we want when we need it at an affordable price.

*Mr. Cardenas. Thank you. When it comes to AI, what

policy solutions could be put in place to reduce the emission associated with deploying AI models and to ensure an environmentally sustainable evolution of AI?

*Dr. Lott. There are a number. Some of them have been highlighted, including energy efficiency in those systems. Also demand flexibility, incentivizing that in the system. Transparency is also a very important part of this.

*Mr. Cardenas. Okay. Thank you very much.

My time expiring, Mr. Chairman, I yield back. Thank you.

*Mr. Duncan. The gentleman yields back. I will now go to the gentleman from Augusta, Georgia, Mr. Allen, for five minutes.

*Mr. Allen. Thank you, Chair Duncan, for holding this hearing to discuss how AI is growing our electricity needs.

My home state of Georgia has been the top state to do business in now 11 years in a row. We have great leadership in our state, and this economic growth depends largely on abundant, reliable, affordable energy that we have. I just visited to celebrate the expansion of units three and four and commercial operation at Plant Vogtle, the first new

reactors built in this country in 30 years. Each of these units will power 500,000 homes and businesses for decades to come. Plant Vogtle is now the largest, cleanest power station in the United States. As manufacturing and data centers are coming to Georgia, nuclear energy is going to play a critical role in ensuring grid security and stability.

Mr. Hassenboehler, according to a McKinsey study, data centers in the United States are expected to consume 10 percent of the country's electricity by the end of the decade. Nuclear energy can play a key role in that and, of course, these businesses are willing to pay whatever they have to pay to get the electricity that they need. How can tech companies and utilities partner to develop rate structures and tariffs to bring on new nuclear capabilities without raising unnecessary costs for residential taxpayers?

*Mr. Hassenboehler. Thank you for the question. And first off, collaboration is key, and -- you said it first -- there are examples of this playing out across the country in different ways, depending on the state and the region.

Getting all folks to the planning table early in the process is a top priority. Bringing in and trying to help

support the needs of the economy and the economic drivers driving the transition.

Being able to make it fair and equitable across rate payers and rate classes is a top priority, as well, making sure cost causation principles are applied, making sure that all things are looked at when it comes to providing the power that these facilities need to support that.

And so we think we are just in a time of early innovation in this space. There needs to be a lot more of it. The committee may be able to have a role in helping facilitate that to support more of these types of innovative structures to make sure that customers large, small, medium-sized, residential all have access to affordable, reliable power, and it gets the power that they want in the regions they want, which is clean.

*Mr. Allen. Good. Mr. Dion, I saw you shaking your head. Would you like to comment on that question?

*Mr. Dion. I think I was just writing notes to myself, Congressman, but I will say this, that it is fantastic to see nuclear back in our portfolio. But in order to take advantage of that, we need to continue that trend. We can't

really be a one-and-done. That is just going to be too difficult. It is going to be too difficult to get a labor force. It is going to be too difficult to get investment, right?

Nobody -- what if you are that person working on that nuclear plant, what is your incentive to get done real quickly when you don't have enough in the pipeline? So we are working very hard on that. We are working with our organized labor partners. We are working with the Center for Workforce Development. That is a critical key component, not just the investments that we are talking about.

The last thing I would add is the transparency that we talk about, it is definitely a two-way street. We need better insight -- and this is going to be something that we are going to have to really work collaboratively with, and EEI and our members are willing to do that, and it may require some NDAs and other legal vessels, but if we don't get the right load information, then we are going to be wrong.

*Mr. Allen. Right.

*Mr. Dion. Bad data means bad predictions.

*Mr. Allen. Yes.

*Mr. Dion. And so we need to be working to find out what is the real load that is going on, and is that load being double counted in any way, shape, or form? And what efficiencies can we count on from the data centers and other large users so that we can factor that in so that we are building to meet the needs?

*Mr. Allen. Well, this -- you know, this needs to be a bottom-up -- we solve problems in this country, and we can solve this problem. It needs to be bottom-up and not top-down, driven by the Federal Government. We have the resources to do that, and I look forward to working with you to make that happen.

And we must utilize all energy sources to power our needs. Mr. Clark, how do you see the increase of demand from data centers, AI, and other emerging technologies, along with the reduction in allowable generation coming from this current Administration's policies complicating integrated resource plans' ability to meet this new demand?

*Mr. Clark. As I indicated, Congressman and Mr. Chairman, in my testimony, this confluence of increasing

demand with pressures on existing generation -- I think you have heard it from sitting FERC commissioners on both sides of the aisle, you have heard it from the RTOs, you have heard it from NERC, you have heard it from utility operators -- the math at a certain point doesn't work. And that is the concern, is that the pressure that is being placed on some of these existing resources will speed up a timeline that we may not be able to meet this increasing demand.

*Mr. Allen. Okay. Well, Mr. Chairman, I am out of time. I have additional questions that I will submit to you for the record.

[The information follows:]

**********COMMITTEE INSERT**********

*Mr. Allen. Thank you very much for your testimony.

*Mr. Balderson. [Presiding] Thank you, Mr. Allen. Next up is the gentlelady from Florida, Ms. Castor.

*Ms. Castor. Well, thank you very much. I want to compliment the majority and minority. I think this is a very important hearing to have right now. We have to do more. It is kind of in the spirit of the new FERC order. We have to plan ahead a little bit better to help businesses and families across America. So thank you to the witnesses for being here today.

I think it is also a sign of a robust and growing economy in America, and that is very good. We have to tackle this to serve the American manufacturing renaissance and figure out how we better speed renewable resources to power transportation, and buildings, and make sure that everyone enjoys the benefits of cleaner, cheaper energy.

And Mr. Dixon [sic], I appreciate your remarks early, and your sentiment, but boy, in my neck of the woods I don't see a lot of the utilities leaning into many of these solutions. And I think that is holding us back on making the grid more reliable, more resilient, and really being able to

lower costs for consumers. So I want to have a conversation with you at the -- moving forward.

But I wanted to ask Professor Lott on the -- focus on the importance of speeding up the interconnection queues. The challenge cannot be understated. I would be interested in hearing your perspective on Ercot's Connect and Manage Approach to interconnection, which has brought 4.2 gigawatts of new energy generation online in just two years. Are there lessons that other regions of the country could learn from Ercot?

*Dr. Lott. Thanks so much for the question. Ercot within my home state of Texas has done a lot that has resulted in what you are seeing today, which is a quick addition of additional resources, including the boom of wind that we have seen and also the addition of solar and storage that we are seeing take off.

Within it one of the big things that the state did was invest in their competitive renewable energy zones. So they invested in building out transmission to enable the connection of a lot of new resources. That was fundamental and foundational. And there is discussions within the state

and within their system of how do we actually go towards a -- two, step two, so that we don't slow ourselves down.

Also, the ability to get quickly to yes or no when it comes to projects is foundational in getting these systems online and connected. The problem is not technology. The problem is not building a grid, getting something connected to it. It is actually all the processes that allow you to build this out.

*Ms. Castor. So what do you say to Members of Congress that -- I mean, the whole system seems to be outdated. It seems to be based on the last century. And there would be a lot of angst, I would think, if Congress comes in and kind of bigfoots our RTOs and states. How do we get to a point where we are all working together and pulling the same direction?

*Dr. Lott. It is a great question with a complicated answer.

The short points I will highlight is, when it comes to the grid, the American Society of Civil Engineers was giving it a C-minus grade before all of these numbers came to fruition around we are expecting rapidly increasing demand. C-minus in my class is not a great place to be. It is on the

cusp of some problematic issues.

And so what I will say is, with the grid, these investments were needed. Now there is an opportunity. We speak so much about the challenges with load growth, but actually there is huge opportunities because we have people who want power, we have people who want reliable, affordable power. So the question is, what are the different steps that the Federal Government can take?

The point has been brought up earlier about convening people together to facilitate early conversations --

*Ms. Castor. Okay, thank you.

Mr. Hassenboehler, you might have some ideas here. You have some experience on Capitol Hill, and you are focused on solutions with the Electricity Customer Alliance. Thank you, by the way, for your support of my bill with Senator Cortez Masto that would make common-sense reforms to interconnection. What do you say on this topic?

*Mr. Hassenboehler. You know, the key challenges really are before us. It is an opportunity, as Dr. Lott said, to have a broader conversation, to really connect the dots between the need -- you know, how electric infrastructure,

really, and all infrastructure, underpins the digital economy. And so we need to start treating this a little bit more with national urgency when you have geopolitical forces at stake and our adversaries, you know, blatantly ramping up their capacities.

You know, we also need, you know, more visibility and transparency into the existing system. There is plenty of efficiencies and opportunities to utilize the existing structures that we have -- the transmission system in a better way. Some of that work on interconnection is still -- is daunting. There still is need to, you know, refine some of the processes and help -- that customers can see some of those savings in a more transparent way.

There is also challenges on, you know, how do you promote more visibility into the system. Grid-enhancing technologies and other types of new systems should be looked at from an efficiency, economic perspective, not from really any other lens. And there needs to be opportunities to incentivize their uptake in the system through multiple venues, whether that is at the state, regional, or Federal level.

And so it is a daunting task, but there -- this committee is the one --

*Ms. Castor. No, you are framing it as part of the great competition with China. I also sit on the bipartisan Select Committee on the Strategic Competition with the Chinese Communist Party. It is a long name. But this morning Ambassador Nick Burns talked to us about the competition in technology, and how we, America, we still have the competitive edge, but they are investing a lot.

And I think you are right. If we can all come together to focus on how we speed cleaner, cheaper resources and get the interconnection problem solved, that is really part of keeping America's dominance in -- on the world stage.

Thank you, I yield back.

*Mr. Balderson. Next up is Mr. Weber from Texas.

*Mr. Weber. I thank you, sir. I want to talk for a minute.

Mr. Clark, you talked about the economic drivers associated with cost of energy, and I want to lay out some things. I am a former air conditioning contractor. We dealt with a lot of high-efficiency standards in home heating and

air conditioning. And let me just tell you that high-efficiency standards do not reduce the cost of energy. It increases the cost of equipment when you have to replace all of your equipment with a higher -- at the latest standards, and a lot more expensive than a 20 or 30-year-old system, so it doesn't necessarily increase the -- reduce the price of energy. The kilowatt is going to be the kilowatt. You follow me? What the cost of energy is.

The cost of generating electricity, just for general conversation, is, number one, the cost of the land it takes where to build a plant; number two, the construction cost, including insurance; number three, the personnel cost, including COLAs, cost of living adjustments, as cost of personnel goes up; number four, the cost of permitting, getting a permit, and the regulatory agencies that have to deal; the cost of those compliance members that have to deal with Federal -- and state regulatory agencies, to be fair; and then also the cost of lawsuits when people who are opposed to -- whether it is pipelines, or transmission lines, or nuclear energy, or whatever it might be, the cost of lawsuits to the objectors who want to prevent energy

companies from producing or generating electricity at a price and the rate that they need to.

And what happens is, as you all know, the cost of producing and generating electricity has to be passed on with a profit margin to the customers, or they don't stay in business. And I would also add, too, that there is a cost of maintenance and equipment replacement.

So we talk a lot about the things -- about the cost of electricity and high efficiency standards help, and they do this, that, and the other. They also hinder in a variety of ways. And all the things I just went through and named, including the cost of permitting, the cost of lawsuits, and all the hindrances that it takes, really drives up the price of electricity and doesn't benefit the consumer. So I am going to stay with you, Mr. Clark, for a minute.

Data centers are rapidly expanding in rural areas such as parts of Texas, where land is less expensive and there is access to existing transmission and distribution infrastructure. So, in your opinion, what are the challenges faced by electric co-ops to provide the energy needs for this expansion?

And so I can give you a couple of specific questions: A, how has the growth of data centers in rural areas impacted utilities, especially when the demand from them exceeds the existing demand in the co-ops? How do they deal with that?

*Mr. Clark. Mr. Chairman and Congressman, you raise a number of good points.

In terms of locating in rural areas, data centers typically will try to look for spots where there may be excess capacity, and they can locate in that area in a quicker way, they can interconnect quicker. Speed to market and cost is really what drives their economic decision-making. And so, if they can find those little pockets, they will attempt to do that.

What we are seeing in the country is those little pockets of availability are drying up. The amount of transmission that is available, the amount of capacity in the system that is available, we are running a grid that is closer and closer to the edge, so they are not finding as many of those spots anymore. That means the next incremental step costs somebody some money. You probably need to have wires and distribution charges. You are probably going to

have to add some form of capacity. Someone has to pay that.

Then it becomes a question of how do you design the rate so that some customers are not inappropriately subsidizing other customers.

*Mr. Weber. And the other part of that, too, is as you are having to come out for new power requirements, you need the permitting reform. And we have been criticized in this committee because we are trying to get permitting reform in place so that permits don't take such a long time.

When the President actually put a stop on LNG, for example, permits for the meantime, that is in my district seven ports. We have got more LNG probably than anybody else in the country, maybe even close to -- in the world, second or third in the world that may be. But the cost of permits and the delay that it gives, all that does is make the cost higher and higher and higher. So I am all about high efficiency standards, but let people choose that on their own.

I want to go back to this one. So how do we design rates and tariffs so that ratepayers are not paying for substations, transformers -- which I would add the President

hasn't instigated a new kind of a transformer, which -- the supply chains like -- is really problematic. But how do we design rates and tariffs so that ratepayers are not paying for substation transformers and transmission rates caused by these data centers?

You already kind of addressed it, but how about the transformers?

*Mr. Clark. Congressman, yes. So this gets down to a cost of service issue. And it is the sort of thing that utility commissions are well versed in. I would argue that it needs to be an open, transparent process so that they -- so that the record is developed so that you know what those costs are, and then you are appropriately assigning them to cost causers.

*Mr. Weber. It is just that easy. I appreciate that.

Mr. Chairman, I yield back.

*Mr. Balderson. Thank you. Next up is Representative Schrier.

*Ms. Schrier. Thank you, Mr. Chairman, and thank you to all of our witnesses for being here. I have very much appreciated reading your remarks.

Load growth and concerns about strain in the Pacific Northwest energy system is being fueled by a number of different actors. The high tech manufacturing sector in the region is booming. We have Microsoft in our state, the state is moving toward a cleaner, more electrified grid. And Washington State is also seeing the buildout and expansion of data centers like never before, particularly in my district. And of course, this is associated with ever-increasing cloud services, AI advances, and blockchain technologies.

And if we are going to remain competitive with economic rivals and shore up domestic manufacturing like is our goal, and then run those data centers, we have got to be able to continue to provide abundant and affordable energy. We also need to bring new sources of non-emitting electricity online to meet increasing demand along with these desperately-needed grid improvements that we have been discussing today.

Now, the interconnection queues, the long wait list for energy projects to connect to the grid, is really hamstringing those efforts, and the fact that we are lagging behind Europe in replacing sluggish, old transmission lines with new carbon core lines is also a hindrance. As Ranking

Member Pallone already noted, the FERC rule is a monumental step for transmission planning and cost allocation to try and resolve these issues.

One of the elements that sort of gets lost in this discussion, but my colleague just alluded to, is the supply chain challenges of both substation and distribution transformers which are so critical to interconnection of so many energy projects that are already there but can't get -- can't support the grid. So this Congress I have been focused on ways we can spur investment in our nation's transformer manufacturing capability. Utility organizations have been, as well. And in April a coalition of groups including the American Public Power Association, EEI, the National Electric Manufacturers Association wrote a letter to the Appropriations Committee requesting funding for this effort, and I would just like to insert that into the record.

Mr. Dion, I know EEI has been very supportive of efforts to appropriate funding --

*Mr. Duncan. Without objection.

[The information follows:]

2332 **********COMMITTEE INSERT**********

2333

*Ms. Schrier. -- specifically for transformer manufacturing. And I am just wondering what it will take to shore up our transformer inventory in the midst of increasing demand and an already present and worsening shortage.

*Mr. Dion. Congresswoman Schrier, thank you very much. It is a great question, and I will just give a little segue.

I was just in Seattle this April for our national key accounts meeting, where we discussed this very issue with nine state commissioners and around 20 customers. So this is a big issue. It is also an incredibly important issue because we find ourselves for the first time in competition with some of our large customers for the same infrastructure that we need to secure our energy future.

So what do we need? It is the same thing that we say all the time. We need some certainty. And what we need is we need the ability as electric companies to make purchases. Not just purchases for what we need. The long lead times are already here. What used to take maybe two months is now taking 16 months. We need the ability almost essentially to, if you will, hedge against that future that we know about. While we are uncertain as to what the numbers are and how big

it will be, we probably are certain of the trend line, and there probably is a no-regrets strategy in making sure that we have the infrastructure that we need to supply our customers and our communities.

And so I think one of the things that we need are some regulatory reforms and working with our large customers at local state commissions to say these things are necessary so we can send the right signals to the manufacturers so that they will increase manufacturing. Right now they may not have that incentive if their production lines are already full, so we need to do that. And I touched on a little bit of what we needed to do with the Center for Energy Workforce Development. That is critical.

*Ms. Schrier. So that market signal, super important.

I just want to note for my colleagues that I offered an amendment in committee last year to authorize domestic transformer manufacturing program for technical and financial assistance at DoE. That also needs to come with funding. It didn't make it into the underlying bill. But, you know, regardless of how our electricity is generated, everyone in here supports a modernized grid, and interconnection, and

making sure that we have the resources we need in case these transformers go out. And so I hope that we can get a bipartisan fix to this particular linchpin.

And I yield back. Thank you.

*Mr. Duncan. The gentlelady yields back. And I think we did this upstairs just a minute ago. Chair Griffith, who is chairing the O&I Subcommittee, which is going on right now, is recognized for five minutes.

*Mr. Griffith. I appreciate it. Thank you, Mr. Chairman, and I apologize to the witnesses. I have been upstairs, chairing another hearing, so I was not able to be down here. But it is always good to be with you all. And thank you so much for your testimony. I may be able to catch up with it later on C-SPAN.

Mr. Clark, according to Electric Power Resource Institute, data centers in Virginia currently consume 25 percent of power, and by 2030 the upper end of their estimates suppose 46 percent of Virginia's power will go to data centers. With all the baseload plant retirements in our neighboring states and in Virginia, how in the world will Virginia be able -- Virginia power companies be able to

retire any dispatchable resources such as coal plants or natural gas plants, and meet the energy demand of the future?

*Mr. Clark. Mr. Chairman and Congressman, it is an issue I think about often because when we moved from North Dakota here to the capital area, when I was appointed to FERC, I moved to Loudoun County, and I now am -- reside within a stone's throw of a few substations and a lot of transmission lines.

The load center that is being built out in Virginia, and especially Northern Virginia, is tremendous. And it is unlike anywhere else in the country. The challenge and I think the answer to that question to meeting the challenge is it has to happen at regulatory processes in Richmond and then at FERC, which is there needs to be a very open, transparent record developed to ensure that, as resources are brought on to serve this load, that the rate design is done in such a way that customers that benefit from the new resources are the ones who pay for those resources, and there is not inappropriate cross-subsidization from those customers who aren't benefiting from the new resources that are brought on.

So it is the sort of nuts and bolts of cost of service

rate-making that regulators are familiar with doing. But it is going to be very, very high profile because of the amount of dollars that we are talking about.

*Mr. Griffith. Right. And while the local folks might want to pay a little bit of it, they shouldn't be carrying the lion's share. Is that what I hear you saying?

*Mr. Clark. It should be -- Congressman, exactly. It should be assigned based on beneficiary. And if you don't benefit, or but for your activity you wouldn't benefit from it, then you should --

*Mr. Griffith. Now, a big part of that energy consumption is to keep everything cool, isn't that right?

*Mr. Clark. Congressman, that is a big part of it. It is not only running all those processors, but it is the cooling of them, as well, especially -- well, obviously, in the summer in Virginia.

*Mr. Griffith. Which has always amazed me, why we can't get more of these facilities to locate in my part of the state, down in southwest Virginia, because, A, we are a little bit higher altitude, that makes it cooler in the first place, plus we have all these abandoned mines. And we have

some abandoned coal mines, we also have an abandoned limestone mine.

One of those I have been in, in the limestone mine, it is about three to four stories high, all kinds of space. It is truly cavernous. It is a man-made cave, and we have got some -- we got a little bill passed a few years ago that, if you are using water out of the mine -- because it is, obviously, it is down in the mine, it doesn't have any life forms in it, so you can avoid the NEPA studies -- it just seems to me that would make sense. And of course, we already have baseload generation from fossil fuels because that is why the coal mines are there, and there is also power plants there because it is close to the coal mines.

So it just seems to me that -- it just amazes me. Why do you think people aren't looking at moving the data centers to places where it actually would require less electricity? And I say that because the mines -- as you know, but maybe the public doesn't know back home -- the mines are naturally cooler because they are underground.

*Mr. Clark. Congressman, it is a great question. It is one that I have -- coming from a northern-tier state, it is

one that I have asked, as well. Data center developers will tell me that it is a number of factors. And sometimes they do look at northern areas, either northern areas or places like in southwest Virginia, where you have less cooling needs to site their plants. But it is a complex formula that includes access to telecommunications networks, it includes the embedded cost of energy in that particular region.

I think there was just a confluence of events that happened that was anchored in northern Virginia, right outside the nation's capital, which had a huge telecommunications network in addition to very affordable rates that encouraged that data center alley to grow up where it did. But I think there are opportunities for other parts of the country that offer advantages like the ones you have talked about.

*Mr. Griffith. Well, and one of the things I think we have to do is look at our fossil fuels as a baseload, because, you know, we are talking about going into this other realm where we use the renewables, and I am fine with that. But to generate enough electricity to do the data centers that we all want to have, the technology that we all want,

and to do other things, we have to continue to look at fossil fuels. And there are ways to do that.

We have a company called MOVA that can pull carbon -- or, you know, or carbon dioxide, whatever you want to pull out, they are doing it. Because we have put so much pressure on coal, they are not looking at that, although that is what they started off looking at, is looking at coal-fired power plants. They are now doing ammonia out of chicken coops, but they have a flatbed process that works. They are not the only technology in the country.

But maybe if we started looking at other ways besides just shutting down our fossil fuel plants, we could provide the electricity for data centers and provide the electricity for the American people that they want and need.

I yield back.

*Mr. Duncan. The gentleman yields back. I will now go to Mrs. Fletcher from Texas for five minutes.

*Mrs. Fletcher. Thank you so much, Mr. Chairman, and thanks to all of our witnesses for being here today, for your testimony. I think it has been really helpful. And obviously, this is an important issue that we on our

committee are very focused on.

I am going to pick up on a couple of the things some of my colleagues have already talked about this morning, but I think it is clear to all of us that the recent explosion of growth in AI has the U.S. poised to be the leader in this new emerging industry. And we have seen, as we were just discussing, you know, a surge in interest in developing new data centers to support investment demands from the market that will drive economic development. Certainly, we are seeing them in my home state of Texas, as we are across the country.

But these data centers do provide -- or create, really -- new challenges, and that is a real tension where I live. As we are trying to meet increased demand, they are trying to pull the power. And there is a concern about this increased demand. At the same time, we are experiencing tremendous stress and capacity issues on our grid, and that is something that everybody is talking about at home.

I know that we talked earlier about some of the statistics at the Electric Power Institute. The Electric Power Research Institute expects the data centers to be as

high as nine percent of electricity demand by 2030, and that these AI queries are expected to take a lot more, maybe 10 times the electricity of a traditional Google search. So as we think about all of that, even though this fast-paced growth is exciting, it is going to exacerbate the existing issues that we already have that we are already struggling to address in my home state and elsewhere in the country, of course.

So one of the things I know Mr. Weber talked about, I know Mr. Peters talked about, I am going to pick up on that theme a little bit, because one of the things we talk about in here a lot is permitting reform and the need for permitting reform. And we know that today it can take, on average, 10 years to get -- you know, to site, get the permits, do the construction. And that is setting aside other slowdowns in the process just to build new transmission lines. And I think one of the challenges that we have is that Congress really needs to move forward on permitting reform.

And so, in the time I do have left, Mr. Dion, I want to address first a couple of questions to you because in your

testimony you talked about how the deployment of domestic energy infrastructure to meet growing energy needs is hampered by the existing permitting process. I think that is certainly true. Do you think that we can add adequate generation to meet the expected demand growth over the next decade under the current permitting process?

*Mr. Dion. So thank you, Congresswoman, for the question. I think the question is twofold.

One, the demand predictions that we have, how accurate are they, and how dire are they? As I said in my testimony, I think the trend line is clear that it is going to be more probably than less, and that the cost of under-building will probably outweigh the cost of overbuilding. So I think, first and foremost, that the need is there.

The issue that you bring up is the permitting timelines that we talked about. So we know that we have certain rules. We know that we need to make certain transitions, and we know we need to do that in a decade. And we know that these processes take a decade or longer. That is the problem, right?

*Mrs. Fletcher. Mm-hmm.

*Mr. Dion. So we definitely need your help. We can meet the goals, we can build -- the infrastructure can be built in a couple of years, and it can be built much more cost effectively, right? The delays are not just delays and things aren't getting done. The delays are also cost delays, both the carrying costs but also the costs of doing business. We know that prices, usually over the course of a decade, will go up and that, again, does pass on to our consumers.

So again, we do have the time, but we do need more certainty, especially in and around the ability for repeated litigation rounds and, if you will, second bites at the apple. More certainty, more clarity around that will help reduce that timeline, and we can get it done.

*Mrs. Fletcher. Thanks. I want to take the time I have left to move on to Dr. Lott, my fellow Texan, native Texan here.

You testified about the need for Congress to consider demand response and other non-wires solutions. And I was just wondering, I have only got about 20 seconds, but can you talk a little bit more or supplement for the record -- because I am going to run out of time -- exactly what these

are, and how these technologies can help optimize performance and manage peak demand to drive down costs? I think that is a really critical issue for us.

*Dr. Lott. Submit for the record. The quick answer is it helps us with peak, it helps us to better utilize our assets by being more flexible. But I will provide more details.

[The information follows:]

**********COMMITTEE INSERT**********

*Mrs. Fletcher. Thank you so much.

I yield back.

*Mr. Duncan. The gentlelady yields back. I now go to Ohio's Mr. Balderson for five minutes.

*Mr. Balderson. Thank you very much, Mr. Chairman, and thank all of you for being here today. My first question is going to be for Mr. Dion and Mr. Clark.

Amazon, Google, Meta, Microsoft, and QTS all have data center operations in Licking County, which I represent. Mr. Hassenboehler, you have discussed the benefits of data centers to the U.S. economy, and we have certainly seen those benefits in my congressional district that I represent. And last year Amazon announced a nearly $8 billion plan to build additional data centers in central Ohio, while Google announced they will build new data centers in the area to power the company's AI innovations. I am very, very excited and grateful to have these companies investing in central Ohio and in the 12th congressional district.

But with these investments and increased electrification, we are almost seeing historic demand growth. In fact, last month AEP, a provider in the State of Ohio,

said they are forecasting average growth closer to 20 percent a year. A few weeks ago, AEP's interim CEO told the Senate Energy and Natural Resources Committee that we cannot substitute our 24/7 dispatchable generation.

Mr. Clark and Mr. Dion, would you agree with that assessment?

Mr. Clark?

*Mr. Clark. Yes.

*Mr. Balderson. Mr. Dion?

*Mr. Dion. As I mentioned previously, yes.

*Mr. Balderson. Thank you.

Recently, the EPA finalized their section 111 rule on power plants, dubbed the Clean Power Plan 2.0, which will drive existing reliable power into early retirement and prevent new natural gas-fired plants from coming online. At the same time, the EPA is actively considering a new rule to cover the existing fleet of natural gas fired plants.

Mr. Clark, given the increased demand on the grid that we have discussed today, what would be consequences if the EPA were to go through with a similar stringent rule covering the existing fleet of gas-fired generating units?

*Mr. Clark. Congressman, I can only point to what the grid experts have been talking about when they analyze this. And if you look at what the grid operators are saying, the North American Electric Reliability Corporation is saying they have concerns with the direction and the pace of the amount and the rapidity of the retirement of either baseload or dispatchable resources.

*Mr. Balderson. Mr. Dion?

*Mr. Dion. Congressman Balderson, the issue of existing power plants is an incredibly important one to us. That is what is keeping the system going at this moment. Planning for new gas -- and whether that is with new technology or with new fuel sources like hydrogen -- we can do that.

But we have expressed concerns, we have talked, and we will continue to talk about the need for the existing generation to stay online in order to meet the reliability needs that we have.

*Mr. Balderson. Thank you.

If you look at the generation queue, less than five percent of the projects are dispatchable 24/7 generation. Mr. Clark, given the weather-dependent nature of wind and

solar, is that number concerning to you?

*Mr. Clark. Congressman, the challenge is that you can hit an inflection point in terms of the amount of -- the amount and different types of resources that are being brought in. Renewables and intermittent resources certainly serve a purpose, and they can be very important, but you still do need dispatchable resources on the system.

What happens at a certain point is you -- incrementally, as you bring on more and more renewables, they become less and less valuable with each increment because they are not providing as much capacity. So what you need is other resources that can back those up. Typically, in electricity markets today, it has been natural gas that does that and enables even more of those renewables to come online.

*Mr. Balderson. Okay, thank you. And do you think that will get better or worse as the EPA's rule regulating new gas-fired plants goes into effect?

*Mr. Clark. Congressman, I personally have concerns with the impact of the EPA rules and what it may mean for the natural gas sector.

Natural gas -- and you can look at every reliability

study that is out there -- still today plays an enormous role in the reliability of the grid day to day, especially during those hours of the day and during net peak demand times when weather-dependent resources aren't available.

*Mr. Balderson. Thank you. I do appreciate all of you being here today.

And thank you again for holding this hearing, Mr. Chairman. These are extremely important issues for our constituents and the future of this country. I believe the best thing we can do at this moment is -- to ensure grid reliability is to prevent the Administration from forcing our existing dispatchable generation into early retirement. That is why this week I will be introducing a Congressional Review Act resolution with Ranking Member Capito to disapprove of the EPA's Clean Power Plan 2.0.

I would like to thank my colleagues on this subcommittee for working with me on this, and for your support. And I look forward to continuing to push back against the EPA's unworkable and dangerous mandates.

Thank you, Mr. Chairman.

*Mr. Duncan. The gentleman yields back. I would like

to take a moment and recognize the former chairman of the full committee, and I will let Ms. DeGette recognize the special guest.

*Ms. DeGette. Thank you so much, Mr. Chairman. We were so happy to see our former chairman, Henry Waxman, come into the room today.

Henry, we miss you, and we think about all of your years of wonderful service to this committee and this Congress. Welcome.

[Applause.]

*Mr. Duncan. Mr. Chairman, welcome back.

I will now go to Mr. Tonko for five minutes.

*Mr. Tonko. Thank you, Mr. Chair.

Mr. Chair, let me echo the thanks also for your great leadership, Chairman Waxman. It was an honor to serve with you on this panel.

As we have heard, data centers are only part of the forecasted demand. Much of this growth is attributable to the hundreds of recently-announced manufacturing facilities across our country. So while load growth may present challenges, it certainly is not a problem. It is

representative of incredible economic development opportunities that are occurring because of the policies put in place by the Biden Administration and House Democrats.

A more robust, modern, flexible, and well-planned grid is key to overcoming these challenges, and I truly believe there are efforts underway by FERC, by DoE, and others to ensure we continue to have a reliable and decarbonized electricity system.

So Mr. Dion, how many EEI members made -- or have many EEI members made ambitious commitments to reducing greenhouse gas emissions?

*Mr. Dion. Mr. Chairman -- Commissioner -- or excuse me, Congressman Tonko -- too many years of regulatory work -- I would have to get you the exact number, but the vast majority of our members have -- and in fact, I think the record is pretty clear, and we -- that we have been leaders. As I mentioned, we have increased the usage of electricity, but our emissions levels are down 41 percent from 2005 levels. So we are on this path.

*Mr. Tonko. Yes, well, we appreciate that, and I thank you.

And Mr. Hassenboehler, do many of the members of your alliance, which include some of the largest companies in the country, have ambitious commitments to reducing greenhouse gas emissions?

*Mr. Hassenboehler. Yes, they do.

*Mr. Tonko. We appreciate that also, and thank you. So it sounds like there is some agreement from major electricity producers and consumers about the importance and the possibility of achieving sustainability goals.

Dr. Lott, why are you confident that the United States can meet its growing electricity demand while maintaining reliability and reducing emissions?

*Dr. Lott. Thank you so much for the question. My confidence comes from the numbers and the modeling and the availability of technologies. Technologies are not where they were 20-plus years ago, when I started. We have integrated in the system. We have exceeded our expectations. We have learned a ton about what it takes to integrate higher levels of variable renewables, energy storage, et cetera. So we are not going into this with an empty slate. We have already learned how to do it, and we have the technologies

that are available.

*Mr. Tonko. And to this end, EPA has proposed what I believe are fairly modest rules to limit carbon pollution from our nation's largest power sector emitters. So, Dr. Lott, what have you seen any evidence that EPA's 111 standards are unachievable or threaten the reliability of our electric -- our electricity system?

*Dr. Lott. How it is executed is key. But no, I have not.

*Mr. Tonko. While certainly EPA and other independent analyzes agree -- so we thank you for those answers.

And Dr. Lott, how important is the long-term certainty provided by EPA standards which set clear rules for utilities, for grid operators, and others to plan for?

*Dr. Lott. I apologize. That question was for me?

*Mr. Tonko. Yes.

*Dr. Lott. Yes.

*Mr. Tonko. Yes.

*Dr. Lott. Sorry, Congressman, I apologize. Would you mind repeating the question?

*Mr. Tonko. Sure. How important is it that long-term

certainty provided by EPA standards, which set clear rules for utilities, grid operators, and others, be a drive for sound planning?

*Dr. Lott. Yes. So long-term certainty is on the top of the wish list for so many different stakeholders that I engage with, and they allow you to effectively plan. When you have rapid changes, a lack of predictability, it is very hard to take all of that uncertainty and effectively build out your system.

*Mr. Tonko. Thank you. And we should not forget that there are tools beyond building new generation that can help meet some of this new demand. That includes making our grid more flexible by embracing demand response programs. Even if some data centers require uninterrupted power, many other loads will be more flexible. And there is a long history of commercial and industrial energy customers' participation in demand response programs to support improved grid management.

So, Dr. Lott, how can expanding demand response programs improve reliability?

*Dr. Lott. Demand response, both in terms of routine demand response -- so getting down daily peaks or summer

peaks -- and also in the face of extreme events, is incredibly cost effective. And being able to bring more of it into the system gives you another tool in the toolbox. So it gives you another tool so that you can better utilize the resources you already have, which drives down the overall cost of the system. And there is a lot of potential there that remains very much untapped.

*Mr. Tonko. Thank you so much.

I do not deny there will be challenges ahead for our grid planners and our operators, but I hope we can do our part in Congress to provide the tools and the incentives necessary to speed up the build-out and modernization of our electricity infrastructure to continue to maintain a reliable and decarbonized system during this time of change and great opportunity.

And with that, Mr. Chair, I yield back.

*Mr. Duncan. The gentleman yields back. I now go to Mr. Pfluger from Texas for five minutes.

*Mr. Pfluger. Thank you, Mr. Chairman.

Mr. Clark, let's talk about just what you see the demand increase being over the next -- just call it 10 years, just

-- I think this hearing is interesting because we are talking about AI data centers, but that is one aspect of the demand increase we are going to see, and probably a very large aspect of it. But just in general, how much electricity, percentage-wise, should we expect to see -- demand increase -- in the next 10 years?

*Mr. Clark. Congressman and Mr. Chairman, the figures vary, depending on what resource you are looking at. But it would appear that we are moving towards a system that in the last few decades might have been a half percent growth system a year, something like that, relatively stagnant, to -- I mean, you see anything from two to three percent or more growth annually. That starts to add up very, very quickly. In your home state of Texas, it has been a leader in demand growth, and it doesn't look like it is slowing down.

An important part of it looks to be these data campuses, but there are other drivers, as well.

*Mr. Pfluger. Yes. I think one of the reasons that we have a lot of concerns because we just don't see a really realistic plan to meet that demand increase. In fact, the power providers have been here, and they have testified in

front of Congress, and they said the greatest threat to our grid is the lack of sources to power that grid because it seems that especially this Administration has put all their eggs in one basket, which might make us feel good about it, but it doesn't actually turn the power on, and might not keep up.

Mr. Dion, I would like to ask you. Talk us through just the electrons and the reliability factor. You know, how reliable are some of the things that are being pushed by the Administration? And compare that with other sources that you prefer.

*Mr. Dion. So Congressman, thank you very much. I appreciate the question.

I think I have mentioned before the hallmarks and the tenets that we live by are the ones that have -- for 100 years are the ones that have to drive us, right? Reliability and affordability, reliability and affordability.

We have talked -- I haven't, but a lot of other people have said at this table, and a lot of other people have sat there and they have talked a lot about the diversity of supply, and all of the above, and diversity of supply, and

all of the above. And that was during a flat load period. We have to get really serious about this, very, very, very serious about it. And at the end of the day, if it is not commercially viable, if it doesn't work, and if it doesn't do what it is supposed to do, and if it is not affordable, then it won't happen.

Just a quick example. We are all for energy efficiency. We are all for flexible demand. We like flat loads. That is actually something we talk about a lot. It benefits all customers. But when we call upon that flexible load, it has to respond. It cannot be voluntary, it cannot be wishy washy. It has to respond. Otherwise, we can't count on it and we have to have something behind that firm to make it reliable.

*Mr. Pfluger. Reliability and affordability.

Dr. Lott, I asked this question to Mr. Kerry probably two years ago, and I said, "Are renewables baseload capable?'' So two years later, I will come back to you. Are renewables baseload capable?

*Dr. Lott. Renewables are not 24/7/365 capable in an economic way. Technically, as an engineer, I can design you

a system. Then we have to pay for it.

*Mr. Pfluger. Right.

*Dr. Lott. So what we find is that you want a mix of renewables -- because they are cheap when they are there -- you want to complement them with storage, and you want to complement them with firm, dispatchable power that can be there 24/7/365, and design the market so that everyone can get paid effectively to keep their systems well maintained and online.

*Mr. Pfluger. Do you believe that government should be designing that system?

*Dr. Lott. I think I am going to actually look to my -- the gentleman to the left of me.

*Mr. Pfluger. Well --

*Dr. Lott. Yes.

*Mr. Pfluger. I want just your opinion. I mean, how far --

*Dr. Lott. I was --

*Mr. Pfluger. -- should government interject itself in designing that system so that we keep up with the dispatchability?

*Dr. Lott. Yes, so what I was going to say is the engineers, the people running the system, they know where the bogeys are. They should be involved in designing it.

When it comes to government, there is a strong role for bringing the people together that need to talk and need to plan together.

*Mr. Pfluger. Yes.

*Dr. Lott. And that is the effective role.

*Mr. Pfluger. I love that answer. I want to leave it to the engineers to design a system that works, and that is really, I think, what this hearing is about is let's leave it to the private industry to figure out what works, what is affordable, what is reliable, what helps us geopolitically, and let's keep government out of it to the extent that they are completely squandering the resources that we have here in this country. And it is hurting Americans, it is hurting our position economically and worldwide.

So I am sorry I didn't get to our last witness, but Mr. Chairman, thanks for a great hearing, I yield back.

*Mr. Duncan. The gentleman yields back. I will give her a chance to sit down and -- you want me to skip over you?

Okay.

I will now go to the future governor of North Dakota, Mr. Armstrong, for five minutes.

*Mr. Armstrong. Thank you, Mr. Chairman.

Mr. Clark, how has the growth of data centers in rural areas impacted utilities needs?

*Mr. Clark. Mr. Chairman, Congressman, good to see you. The impact in rural areas, much like the impact anywhere, is dramatic. If you have the size of load that some of these data campuses are being dropped into the system, to the degree you have excess capacity or some available capacity that is there, you may be able to incorporate it relatively quickly. To the degree that you are running at the edge of scarcity, which increasingly our system is, then that is going to present challenges.

In a rural area what you have is a smaller rate base to spread some of those costs across. So of course, the issue of cost allocation becomes even more important in a rural area.

*Mr. Armstrong. Well, and the reason I ask is because we have, you know, a pretty rural economy in North Dakota.

We have some unique weather conditions that make these things really appealable. And we are having one going on in Williams County. And we are in the heart of the Bakken, and we might run out of power, I mean, just when you look at the infrastructure and the way it looks.

So I was wondering if you could go into a little more detail about the Administration's policies and zero emissions policies would have on regional transmission, RTO, wholesale markets.

*Mr. Clark. Mr. Chairman and Congressman, so the -- I guess a couple of points on that. I mean, any policy, putting aside its merits or legality or things like that, that has the effect of decreasing the amount of availability of capacity, or causing the retirement of capacity faster than it otherwise would, is going to put more strain on that system.

With regard to the RTOs -- and I think, taking off from where Dr. Lott was -- I agree with everything that was said about there will be some mix of energy efficiency, demand response, solar, batteries, renewables, and dispatchable capacity. Designing a market around that is extraordinarily

difficult, because the markets are designed around what is cheapest to run right now. And so that has been a 20-year process at FERC, trying to get those market signals corrected.

*Mr. Armstrong. Well, and I think that is -- I mean, functionally, for six years in Congress, one of the -- and particularly on this committee, I mean, we have very aspirational goals, and that is great. Like, we should want to have -- the problem we run into, I think, is when aspirational goals and that policy comes at the direct hindrance of operational implementation.

And I don't think we spend near enough time here talking about the actual economics of power production. I always use MISO, and this is an example. And we -- and Republicans are guilty of this, to some degree or another one. One, we were way late to this game, politically -- we just were -- and not understanding that our consumers are demanding cleaner power. I mean, if they want to put a carbon score on a soybean, we will figure out how to do it. I mean, we grow a lot of things in North Dakota we don't produce there.

But also, when renewables get above a certain percentage

on the grid, they better go from like 27 percent to 85 percent in a really quick hurry, because I need Coal Creek and Coyote to produce to be able to be economically viable in June because I am really, really going to need them in February.

And you even saw this with the EPA, right, and the peaker plants in Indiana, and pulling them out of the rule, because all of a sudden somebody looks around and says, well, without those we might not have heat in winter.

And so that has always been my question on this. I don't have a -- and I have tried to figure out a better and more unique way, but you are one of the smartest people I know on this, and I have -- I mean, I have said this, I said, let's just take the most aspirational version of renewable energy, and that can power the United States for 360 out of 365 days a year. What do we do the other five?

Like, what is the policy we put in place so we have nuclear power, coal-fired power, natural gas power to make sure that the greatest country in the history of the world doesn't go dark for five days? And I think we don't have enough conversation about what that really, really looks like

moving forward with data centers, without data centers, but the economics of power production.

And do you have any opinions on that? That is a long question. You got 45 seconds.

[Laughter.]

*Mr. Clark. Yes, 40 seconds left. So it is at the core of market design that FERC is trying to deal with. And honestly, it is increasingly challenged because of the amount of public policies and subsidies that are now in the markets themselves.

*Mr. Armstrong. Yes, I mean, primacy and repower matter to those.

*Mr. Clark. Congressmen, the markets were designed around the idea that prices would do the heavy lifting with regard to reliability and investments. And increasingly, what we have now is a price signal that is broken and public policies that are that are overlaying that market design. So it is going to require either an entire market redesign or you are going to continue to see the sort of things that we have seen in the last few years, which is increasing concerns about units that are still needed for reliability retiring

and leaving the market.

*Mr. Armstrong. And last, because I am two seconds over, you have had a great career, and it is great to have you here. Have you ever thought about going full circle and going back to your very first job? We may have an opportunity to have one of those open, depending on what happens in two weeks. So I appreciate you being here.

And I yield back.

*Mr. Duncan. The gentleman yields back. Not seeing another Republican, I will now go to Ms. Barragan for five minutes.

*Ms. Barragan. Thank you, Mr. Chairman.

Smart planning for the new data centers that power AI would be critical to ensure they are powered by clean energy, not fossil fuels. Dr. Lott, can you -- rather, can utilities, private industry, and government work together to ensure new data center locations rely on clean energy, and that the increased growth in energy demand is accurately forecast?

*Dr. Lott. Yes, they can, and there is a role for the Federal Government in facilitating those conversations.

I will also highlight a point that came up earlier, which is that so many of these companies have these goals, and they are looking for solutions. And for the most part, in conversations with them, they are telling me, "We don't want to be utilities. We need utility partners to work with us so we can achieve our goals.''

*Ms. Barragan. And, I mean, do you have any suggestions on how that conversation could -- should go with -- between all those that I just mentioned?

*Dr. Lott. There is a lot of different levels. We have spoken about some of them today, which is when it talks about -- investments in the grid is one example, because when you talk about enabling clean power to come on quickly, efficiently, and remain affordable, you are talking about a grid conversation. How do we build out the lines we need, repower, the lines we have, et cetera, all the non-wire solutions. There is conversations between those groups.

There is also conversations at the local level of how do we get to yes, where we are getting a supply that can remain affordable and serve all consumers while meeting very quickly the needs of these growing demand centers?

*Ms. Barragan. Great, thank you.

Mr. Chairman, I would like to enter into the record an article. It is dated April 12, 2024 from the Latitude Media. It is titled, "Microsoft Says Georgia May be Overstating Data Center Growth.'' The article reports on how Georgia has proposed to build three new fossil-fuel-powered gas plants based on an overestimated power demand from new data centers --

*Mr. Duncan. Without objection --

*Ms. Barragan. -- which Microsoft disputed, and raised concerns about unnecessary dirty energy generation that would be added to the grid.

*Mr. Duncan. Without objection, so ordered.

[The information follows:]

**********COMMITTEE INSERT**********

*Ms. Barragan. Thank you.

Mr. Hassenboehler, how is your organization working with utilities and public service commissions to ensure that there are transparent, accurate demand projections for electricity from new data centers so that new, costly power plants are not unnecessarily built which can put a burden on low-income ratepayers?

*Mr. Hassenboehler. Thank you, Congresswoman, for the question. It is a top critical issue that we all need to be addressing.

We need to really better align economic and load forecasting with electric infrastructure development. There needs to be more transparency in this process across all stakeholders. More need to be at the table on an earlier basis.

The load forecasting is very tricky. As you know, there is a lot of uncertainties right now that are coming in place. So the only way to break those barriers down is to bring more collaboration between the utilities and the customers driving the load growth in order to better plan for these types of arrangements.

*Ms. Barragan. Well, thank you.

And Dr. Lott, how will load growth from data centers affect grid reliability?

And what should governments do to ensure underserved communities aren't hit first by reliability issues during extreme weather such as, say, a heat wave?

*Dr. Lott. Yes, it is a great question. Thank you so much for the question, Congresswoman.

When it comes to these new, huge demand sources that come -- integrating into whatever their agreements are, flexibility during these extreme events so that we aren't leaving people unsafe in their homes during periods of time. So figuring out how we build out that system, whether it is integrating storage, integrating flexibility in their demand so they can be one of the big responses when extreme weather events happen, which they do.

In addition to that, you can integrate more demand response not just in those big industrialized, but the rest of the system.

*Ms. Barragan. Great, thank you.

And Mr. Hassenboehler, in my last question, how are

members of Electricity Customer Alliance integrating AI into your operations to optimize data center efficiency and predictive maintenance, which can reduce energy costs and lengthen the lifespan of data centers?

*Mr. Hassenboehler. There are many examples that are just playing out on that front. AI uptake is all about increasing productivity. It is all about optimizing visibility into systems and be able to predict more generative outcomes for challenging situations. I would be happy to provide for the record a long list of examples of ways that AI is helping to mitigate some of these issues on the energy development side, but also create new opportunities and economic development for that angle.

*Ms. Barragan. Great. Well, I want to thank all the witnesses for your work. The AI space is one there is a lot of conversations on, and everybody is trying to figure out how best to get ahead of it, and we already behind it. And of course, the energy issues and -- that will be created by AI is so important.

So I appreciate the hearing today. Thank you. I yield back.

*Mr. Duncan. The gentlelady yields back. I now go to Dr. Joyce for five minutes.

*Mr. Joyce. First I want to thank Chairman Duncan and Ranking Member DeGette for allowing me to waive on to this important hearing.

As we have covered in several E&C hearings, AI will have a revolutionary effect on every aspect of our lives. With everything from medical services to energy exploration, AI will add efficiency and precision that will allow Americans to receive faster results and have a more productive and dynamic economy.

This should be good news for all Americans, but great news for Pennsylvanians. As Mark Zuckerberg said in an interview in April, "Access to energy is going to be the largest constraint to AI and data centers.'' Pennsylvania, with its reliable nuclear and natural gas assets, can provide an excellent future home for this industry.

The problem is the Biden Administration's rush-to-green agenda is crippling our ability to generate power. PJM, which is the nation's largest RTO, and includes my district in Pennsylvania, released a report last year projecting 40

gigawatts of reliable, dispatchable generation to retire by 2030. PJM labels the majority of these retirements as policy-driven decisions. Nearly all, 94 percent, of the proposed replacement pilot for these retirements are renewables, which historically have only a five percent rate of completion. This was PJM's projection before the EPA's recently finalized 111 rule.

In a statement issued by PJM in response to that rule, the grid operator expressed its concern that these rules would only make matters worse. Specifically, it cited the growing demand being discussed at this hearing today, saying -- and I am quoting -- "We are seeing vastly increased demand as a result of new data center load. The EPA has not sufficiently reconciled its compliance states with the need for generation to meet dramatically increasing load demands on the system.''

There is a fundamental mismatch between our surging demand for energy, including the growth of AI, and the outcomes being driven by irresponsible environmental regulations. Mr. Clark, you have testified today that price formation in RTO markets are at a breaking point -- your

words -- due to, in large part, to subsidies and policies that undermine basic wholesale market principles. What can be done at the Federal level to address this?

And what actions states like mine should -- that utilize PJM and the utilities be considered to ensure the necessary dispatchable generation is in place to serve not just data centers, but also the energy that so many families in Pennsylvania rely on?

*Mr. Clark. Congressman, thank you for the question. It is a good one.

So if you listen to the smart folks at the RTOs, what they will say is that the challenge that we have is there is less and less money that is coming -- less revenues that are coming through the energy markets. And that is because prices in the energy markets are suppressed, there are more and more resources that are zero fuel costs. So there is less money coming out of the energy markets. That makes the retention of capacity that much more important, because you have to be able to have some sort of sufficient revenue to maintain capacity that is still needed for reliability. So it makes capacity retention mechanisms that much more

important in the RTOs.

In a vertically integrated state, in a regulated state, which Pennsylvania is not, there is a little bit more direct path to make sure that that capacity is retained. It is more challenging in the RTOs, and they, working with FERC, are going to have to come up with mechanisms that ensure that that needed capacity is still available and in the market so that it can support reliability.

*Mr. Joyce. Mr. Clark, within the last 10 years nuclear assets in Pennsylvania were at risk of closing, largely due to a deregulated energy market that you just mentioned and an abundance of low-priced, plentiful natural gas. Do you agree that specific regions behind the meter can -- that can be agreements arrived upon that can give nuclear assets the certainty that they need to continue to operate and make investments in their plants?

*Mr. Clark. Congressman, that has certainly been a strategy that the merchant nuclear operators have looked at, and I think it is one that undoubtedly is driving more revenue into some of those key assets.

So on the plus side of the column, it helps retain units

that I think are national assets and are needed to be retained. The challenge is that does have an impact, that particular strategy, on the rest of the customers in the system in that you are taking out hundreds of megawatts of capacity out of the supply stack that serves the rest of the customer base, and that is going to have some sort of impact on those customers that I think should be looked into. And it is probably a regulatory issue that needs to be addressed.

*Mr. Joyce. Mr. Chairman, I thank you again for allowing me to waive on. My time has expired, I yield back.

*Mr. Duncan. The gentleman yields back, and that will conclude the question portion. Seeing no other members, I would like to thank our witnesses for being here.

You did a fabulous job in answering members' questions, providing a lot of information. Members may have additional questions which they will submit to you guys.

I will remind members they have 10 business days to submit additional questions for the record, and I would ask the witnesses to do their best to submit the responses within 10 business days upon receipt.

I ask unanimous consent to insert in the record

documents included on the staff hearing documents list.

Without objection, that will be the order.

[The information follows:]

**********COMMITTEE INSERT**********

*Mr. Duncan. And without objection, the subcommittee will stand adjourned.

[Whereupon, at 1:06 p.m., the subcommittee was adjourned.]