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THE CLEAN FUTURE ACT AND ELECTRIC TRANSMISSION: DELIVERING CLEAN POWER TO THE PEOPLE

TUESDAY, JUNE 29, 2021

House of Representatives,

Subcommittee on Energy,

Committee on Energy and Commerce,

Washington, D.C.

The subcommittee met, pursuant to notice, at 10:37 a.m., in Room 2123, Rayburn House Office Building, Hon. Bobby Rush [chairman of the subcommittee] presiding.

Present: Representatives Rush, DeGette, Doyle, Butterfield, Matsui, Castor, McNerney, Welch, Tonko, Schrader, Peters, Veasey, Kuster, Barragan, Blunt Rochester, O'Halleran, Schrier, Pallone (ex officio); Upton, Burgess, Latta, McKinley, Kinzinger, Griffith, Johnson, Bucshon, Walberg, Duncan, Palmer, Lesko, Pence, Armstrong, and Rodgers (ex officio).

Staff present: Jeff Carroll, Staff Director; Waverly Gordon, General Counsel; Tiffany Guarascio, Deputy Staff Director; Perry Hamilton, Clerk; Anne Marie Hirschberger, FERC Detailee; Zach Kahan, Deputy Director Outreach and Member Service; Rick Kessler, Senior Advisor and Staff Director, Energy and Environment; Jourdan Lewis, Policy Coordinator; Tyler O'Connor, Energy Counsel; Lino Pena Martinez, Policy Analyst; Kaitlyn Peel, Digital Director; Caroline Rinker, Press Assistant; Tim Robinson, Chief Counsel; Chloe Rodriguez, Clerk; Caroline Wood, Staff Assistant; Tuley Wright, Senior Energy and Environment Policy Advisor; Nate Hodson, Minority Staff Director; Emily King, Minority Member Services Director; Mary Martin, Minority Chief Counsel, Energy & Environment; Brandon Mooney, Minority Deputy Chief Counsel for Energy; Peter Spencer, Minority Professional Staff Member, Energy; and Michael Taggart, Minority Policy Director.

*Mr. Rush. The hearing is now called to order once again. The Subcommittee on Energy will come to order now. Today, the subcommittee is holding a hearing entitled the CLEAN Future and Electric Transmission: Delivering Clean Power to the People. Due to COVID-19 public hearing -- public health emergency, members can participate in today's hearing either in person or remotely via online videoconferencing.

Those who are not designated and participating in person must wear a mask and be socially distant. Such members may remove their mask when they are under recognition and speaking from a microphone. Staff and press who are not designated and present in the committee room must wear a mask at all times and be socially distant. While members participating remotely, your microphone will be set on mute for the purpose of eliminating any inadvertent background noise.

Members participating remotely will need to unmute your microphone each time you wish to speak. Please note that once you unmute your microphone, anything and everything that is said in Webex will be heard over the loudspeaker in the committee room and subject to be heard by livestream and CSPAN.

Since members are participating from different locations in today's hearing, all recognition of members such as for

questions will be in order of subcommittee seniority. Documents for the record can be sent to Lino Pena-Martinez at the email address we have provided to staff. All documents will be entered into the record at the conclusion of the hearing. The chair now recognizes himself for five minutes for the purposes of an opening statement.

Once again, good morning. Today the Subcommittee on Energy convenes for a hearing on the CLEAN Future Act as well as other legislation to address electric transmission and the delivery of clean, reliable power. As this subcommittee has discussed in great detail, the energy sector is the second largest source of greenhouse gas emission in the U.S.

Despite this fact, some of the greatest opportunity to address the threat of climate change are under the auspices of this sector. The generation of electricity and its delivery to consumers and businesses is undoubtedly essential to the U.S. economy.

However, a 21st-century clean energy economy necessitates additional planning and infrastructure investment to advance the large-scale delivery of clean energy in order to effectively cut greenhouse gas pollution and mitigate climate change.

A fundamental instrument that is key to the -- employment of reliable and affordable clean energy is electric transmission. Speaking frankly, we need a major

expand of the electric transmission system to establish our net zero clean energy economy.

According to a report from Princeton University, the U.S. would need to triple the size of its current electricity transmission system in just 15 short years. Adding to this, the American Society Civil Engineers report that nearly 70 percent of the existing 600,000 circuit miles of transmission line are half past their lifespan. Given these factors and the ongoing discussions of our -- our nation's infrastructure, today's legislative hearing is tremendously important.

This is particularly true as today's bill all take aim at addressing the buildout of electricity transmission infrastructure to achieve our climate and clean energy goals.

As amount, the CLEAN Future Act, which I take great pride in leading with Chairman Pallone and Chairman Tonko would establish several policies to facilitate resilient and -- electricity supply all while enhancing federal authority to those in -- through the Federal Energy Regulatory Commission and also supports the employment of non-transmission alternative that have put aside the need for additional transmission infrastructure.

Today's legislative hearing also includes several other bills authorized by my esteemed subcommittee colleague which would help us achieve our clean energy goal.

[The prepared statement of Mr. Rush follows:]

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

*Mr. Rush. With that in mind, I yield the balance of my time to the gentleman from California, Congressman Peters.

*Mr. Peters. Thank you so much, Mr. Chairman, for the time and for hosting this event. Electric transmission, as you said, is often overlooked, yet it's an essential component to addressing the climate crisis. Successfully siting interstate transmission lines is notoriously difficult, and it's in large part because of the burdensome and unworkable regulatory environment we face. I introduced the POWER ON Act to clarify the Federal Energy Regulatory Commission's backstop siting authority for interstate transmission projects while establishing more inclusive engagement process with states, tribes, and property owners.

And if enacted, the bill will accelerated the build -- accelerate the buildout of clean energy, increase our power systems' reliability, and lower the cost of electricity for consumers. It's been endorsed by key groups, including the Americans for a Clean Energy Grid, the American Clean Power Association, and the American Council on Renewable Energy. I am grateful to the committee chairs for including language from the POWER ON Act and the CLEAN Future Act and for collaborating closely with me and my staff on transmission policy more broadly and inviting my colleagues on both sides of the aisle to join me in pushing for these important regulatory reforms. With that, Mr. Chairman, I yield back.

*Mr. Rush. The gentleman yields back.

Now the chair recognizes the ranking member, Mr. Upton, for five minutes for the purposes of an opening statement.

*Mr. Upton. Well, thank you, my friend, Mr. Chairman, and thank you to our witness for appearing before us, providing the testimony. It is nice to see someone in person here. I would note that I have, too, been fully vaccinated. I look forward to today's hearing to examine the challenges and opportunities to modernize our electric grid. However, I would like to think that Congress could fix some of the most obvious needs.

Instead of the majority's Green New Deal wish list, we ought to start with proven bipartisan issues. The committee ought to be focused on strengthening the reliability of the electric grid to prevent blackouts, lowering the cost of utility bills for our constituents, and preventing repeat cyber-attacks such as the one that took down the Colonial Pipeline a few weeks ago.

Instead, we see a thousand-page bill with more than half a trillion dollars in spending, the CLEAN Future Act, which would ban hydraulic fracturing, ban plastics, ban new pipelines, put a chilling effect on new infrastructure development in attempt to nationalize our electric grid.

CLEAN Future Act would impose harsh new federal mandates for electricity generation and socialize the cost, forcing

everyone's electric bills to go up regardless of their income. Among the most troublesome electricity provisions, the CLEAN Future Act would take away states' rights by forcing utilities to place transmission facilities under the control of an RTO, regional transmission organization, or independent systems operator, ISO.

Another provision, the so-called right to clean energy is a huge giveaway to big companies and the rich so that they can install new solar panels and build wind farms at virtually everybody else's expense. The problem with these provisions is that by allowing some to cut the line, it leaves average residential customers on the hook to maintain existing equipment and aging power plants.

The right to clean energy is an unfair regressive tax on residential customers. So Mr. Chairman, I know that we shared the goal to improve the reliability of the electric grid and lower utility bills for our constituents, but there is a lot that we can accomplish in a bipartisan way.

[The prepared statement of Mr. Upton follows:]

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

*Mr. Upton. And with that, I look forward to hearing from the witnesses today. I yield the balance of my time to Mr. Armstrong to introduce Mr. Clark, who will be joining us on the second panel.

*Mr. Armstrong. Thank you, Mr. Upton. So we are lucky -- I am lucky to call Tony Clark my friend, and we are lucky to have him here. From 1994 to '97, he was in the North Dakota House of Representatives. He was the North Dakota labor commissioner in -- for two years in '99 and 2000. He was the North Dakota public service commissioner from 2001 to 2012, and he was a FERC commissioner from 2012 to 2016. If anyone -- and North Dakota is obviously an energy producing state. If anybody can talk about the state, federal, local, public/private partnerships and how we move the ball forward in these areas, Tony Clark is it.

He has been fantastic for the state. He has been fantastic for the country, and his expertise will be much needed today. And with that, I'll yield back.

*Mr. Upton. Yield back, Mr. Chairman.

*Mr. Rush. The gentleman yields back. Now the chair recognizes Mr. Pallone, the chairman of the full committee, for five minutes for -- of an opening statement.

*The Chairman. Thank you, Chairman Rush. Today we continue our series of legislative hearings on H.R. 1512, the CLEAN Future Act, which I introduced with Chairman Rush and

Tonko to address the climate crisis and get us to a hundred percent clean economy no later than 2050. One of the most important steps to combat the climate crisis is to make our power grid cleaner and more reliable. Today's hearing focuses on provisions of the CLEAN Future Act and three other bills that support building a resilient electric transmission system to deliver clean, low-cost power from remote regions of the country to America's cities, towns, and industry. And simply put, we will not be able to meet our clean energy goals unless we build more transmission. I believe that the need to responsibly build more electric transmission is an issue that can unite Democrats and Republicans. After all, electric transmission delivers the inexpensive electricity that powers American industry and employs hundreds of thousands of American workers.

Despite these benefits, we have not yet done enough to ensure our transmission system is equipped to handle the challenges of the 21st Century as we deploy more offshore wind along our coast, building the necessary transmission to hook this new generation to the grid will be a crucial step. Furthermore, extreme weather events like the current unprecedented heatwave in the Pacific Northwest and the cold snap that brought down the Texas grid earlier this year basically remind us of the continuing need to invest in our transmission system.

The CLEAN Future Act makes those investments to modernize the grid and ensure that all Americans have access to clean, reliable power at a reasonable cost. As we work to build out this essential infrastructure, however, we must make sure we do so responsibly and don't build more than what's needed. New and innovative technologies can allow us to use our existing transmission infrastructure more efficiently.

Transmission planning processes can make -- can be made more transparent to the public, allowing us all to better understand how new transmission needs are identified. And these and other measures will help protect ratepayers from unnecessary and excessive transmission infrastructure cost that we don't really need. So the CLEAN Future Act includes key provisions that recognize the critical role transmission has to play in powering a clean energy economy, combatting the climate crisis, improving reliability, and creating jobs for Americans. And it does all of this while also making sure we do not overburden ratepayers with unnecessary cost.

The legislation calls upon FERC to reform its processes to require interregional transmission planning to support the integration of renewable energy resources. It also bolsters federal authority to require permitting for certain interstate transmission lines that will bring clean and low-cost energy to consumers. And it provides financial and

technical assistance to state, local and tribal governments to help with the permitting and siting of interstate transmission lines.

In addition to the CLEAN Future Act, we'll also consider three bills introduced by my colleagues, Representatives Peters, Castor, and Casten. And I want to thank them for their hard work on these bills. If we put the right policies in place, I believe electric transmission can help us tackle the climate crisis and build the clean, prosperous and affordable energy future.

[The prepared statement of The Chairman follows:]

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

*The Chairman. And now I'd like to yield the remainder of my time to the gentlewoman from Florida, Representative Castor.

*Ms. Castor. Well, thank you, Chairman Pallone.

Members, this is one of the most important hearings that we have had in this committee because America's electric grid is in need of major investments. And we have got to work together to modernize and strengthen the grid. Doing so will create a huge number of jobs. It will help lower our electric bills for our neighbors back home.

It will cut pollution. It will improve our health, will help us expand clean energy so that we can avoid the catastrophic impacts of the climate crisis. So I want to thank Chairman Pallone and Chairman Rush very much for including two of my legislative proposals today.

First, the Transmission Siting Assistance Program is Section 218 in the CLEAN Future Act. It would provide technical assistance to -- and economic incentives to states and local communities as carrots to encourage them to do a better job of planning and approving new interstate transmission lines. And second, H.R. 4027, the Efficient Grid Interconnection Act, would speed up connecting new clean energy projects to the existing grid and ease transmission congestion. This bill is supported by a large coalition of business and environmental groups, and I thank them for their

support. I anticipate that many of our colleagues will hear from them and thank you very much. And I yield back by time.

*The Chairman. And Mr. Chairman, I yield back as well.

*Mr. Rush. The gentleman yields back. The chair now recognizes Ms. Rodgers, the ranking member of the full committee, for five more minutes for the purpose of an opening statement.

*Mrs. Rodgers. Thank you, Chairman Rush. What's becoming increasingly clear to people across this country over the last year is that the role -- the role of state and federal policies that jeopardize affordable, reliable energy and power, keeping the lights on is needed for a prosperous society and vital for our health and safety. It is key to our quality of life and lifting people out of poverty.

Policymakers should not lose sight of that. And it's not just about keeping the lights on. Right now in Eastern Washington and across the Pacific Northwest, it's about keeping the fans and the air conditioning on too. We are currently experiencing an extreme heat wave. There are emergency cooling centers open in my hometown in Spokane where temperatures are hovering around 110.

Last night, one of the major utilities in the area notified customers of mandatory outages because it was seeing the second highest level of demand over the past year. We aren't strangers to extreme weather in the Pacific Northwest.

These weather events have solidified the importance of reliable power.

This past winter, Washington State had harmful deep freezes that drove up energy demand. Fortunately, the Four Lower Snake River Dams boosted hydroelectric power to meet the need. They picked up the slack when one of the largest dams in the Columbia River system had to shut down, reducing the harmful impact of serious power shortages.

Yet even in Washington State, we face calls to dismantle these important clean energy sources for the sake of radical agendas that fail to prioritize the delivery of power for people. When these policies undermine affordable, reliable delivery of energy and power, serious harms to public health and safety can follow. The heat has not been isolated to the Pacific -- Pacific Northwest.

In recent weeks, both California and Texas electric grid operators have urged people to conserve electricity as heat waves threaten supply. Last month, the North American Electric Reliability Corporation, NERC, issued its summer reliability assessment. This report said California is at risk of energy emergencies during normal summer demand and high risk if weather events cause above normal demand across the West. We are seeing that happen now. Texas, the upper Midwest, and New England are at risk if there is a major weather event driving up power demand according to this

report. As these examples indicate, we are witnessing an electricity reliability crisis slowly unfold across large regions of the country. And much of this can be traced back to state environmental and federal regulatory policies from renewable energy standards to electricity market regulatory structures that drive out traditional baseload generation assets.

Meanwhile the left's rush to green agenda doubles down on wind and solar and building lots more transmission. To meet the administration's emissions targets, the push is for massive electrification on an unprecedented scale and pace for the next 15 years. And it would amount to a construction program 600 percent larger than any utility buildout that we have seen in the last half century.

You cannot do this without extraordinary mandates and costs on workers and families. That's why it seems unrealistic, unattainable. Testimony before the committee has already outlined the growing public resistance to siting, permitting, and building new transmission. Today, building new transmission can take 15 years or more, and there are several examples of key projects running into opposition, which brings us to the CLEAN Future Act that will -- that I -- I am concerned is going to take us backwards to a time before reliable electricity and modern conveniences. There are certainly practical reforms to consider for transmission

policy.

However, the rush to green incentives and mandates will undermine reliability at a great cost. The bill seeks to prioritize massive electrification and renewable buildout without regard to the impacts on reliable and affordable power. It seeks to make it easier to site transmission while making it harder to build natural gas pipelines, which are critical for renewables.

Also troubling is the rush to mandate regulatory structures that prioritize renewables which are weather dependent energy at the expense of traditional baseload and dispatchable energy. Ladies and gentlemen, I am concerned that we are creating an affordability crisis, as California-style costs are spread to other regions of the country. This is not the way that we move forward with affordable, reliable power. This is not the way to move to a clean energy future. We can lead the world in reducing carbon emissions with new American innovation, without jeopardizing reliability and affordable energy. With that, I yield back.

[The prepared statement of Mrs. Rodgers follows:]

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

*Mr. Rush. The ranking member yields back. The chair would like to remind members that pursuant to committee rules, all members' written opening statements shall be made part of the record.

I would now, at this time, like to welcome our first witness for today's hearing, Ms. Patricia Hoffman, acting assistant secretary of the U.S. Department of Energy. Ms. Hoffman, welcome to today's subcommittee hearing, and you are now recognized for five minutes for the purposes of an opening statement.

STATEMENT OF PATRICIA HOFFMAN, ACTING ASSISTANT SECRETARY, OFFICE OF ELECTRICITY, U.S. DEPARTMENT OF ENERGY

STATEMENT OF PATRICIA HOFFMAN

*Ms. Hoffman. Thank you, Chairman Rush, Member Upton, distinguished members of the subcommittee. I appreciate being here in person as well. I do appreciate the opportunity to testify on behalf of the Department of Energy on the role of transmission and achieving the Biden-Harris Administration's clean energy goals. The department's authorities related to transmission infrastructure, including new authorities that have been proposed in the committee's CLEAN Future Act and other legislation.

Modernizing and expanding the electric transmission grid could unlock access to cleaner, lower-cost energy for consumers and businesses while improving the reliability and resilience of the electricity delivery in the face of extreme weather and supply disruptions. President Biden has established the ambitious climate goals of carbon pollution free power sector by 2035 and a net zero greenhouse gas emission economy by 2050.

Building up the nation's electric transmission system will play a key part in achieving these goals. An independent analysis by the Americans for a Clean Energy Grid

confirms the importance of investing in our electricity grid. It identifies more than 20 major transmission projects that may be poised to move forward, potentially creating more than 600,000 new transmission-related jobs and an additional 640,000 jobs from new clean energy generation projects.

The most economically attractive and potential renewable resources are typically located in geographical areas that are remote from demand centers. Therefore, promoting the shift towards clean power sector does require investment in critical enabling infrastructure such as transmission to increase the access to renewable resources.

Such investments in transmission infrastructure include increasing the capacity of existing lines, minimizing transmission losses through the use of new technologies, building long-distance high-voltage transmission lines. Recent research shows that over 755 gigawatts of generation capacity is seeking transmission interconnection. But failure rates and wait times suggests growing interconnection and transmission challenges. There have been calls for interconnection reform and changes to the broader transmission planning process.

In addition to supporting new clean energy -- in addition to supporting the clean energy transition, a robust transmission system further enhances grid reliability and resilience. Investment in replacing, upgrading and expanding

transmission infrastructure will help minimize power outages, protect the grid against climate-induced extreme weather, restore electricity more quickly when outages occur, but most importantly, expanding transmission capacity improves the resilience and flexibility of the energy system by creating more numerous energy delivery pathways.

The Office of Electricity is specifically looking at how to support operational efficiencies and flexibility within the delivery system in support of the administration goals through the development and demonstration of improved sensors, flow control and flexible technologies such as energy storage.

The department has several critical tools that have already been authorized by Congress to aid in the development of transmission. Moving to accelerate transmission development through the use of existing authorities and available funding is key. Transmission projects particularly, with appropriate stakeholder engagements, can take years of development time. And the appropriate process to engage the authorities will take time as well.

Additionally, the department has authorities to help finance transmission projects. The Department of Energy's Loan Program Office and WAPA Transmission Infrastructure Protection Program are efforts that can expand and improve the nation's transmission grid.

While tools are available from Congress and have been provided by the department to overcome barriers, additional actions outlined in the President's budget and the American Jobs Plan can make a difference. The department also recognizes this committee has put forth a number of additional policy proposals to address barriers to transmission development.

As the committee considers this policy, the department recommends several areas for consideration, increasing the capacity, accelerating interconnection, and planning for interregional transmission. In conclusion, a secure and resilient power grid is important to preserving our economy, and I thank you for your time, and I look forward to your questions.

[The prepared statement of Ms. Hoffman follows:]

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*Mr. Rush. Thank you, Secretary Hoffman. We will now move to members' question. Each member will have five minutes to ask questions of our witness. And now it's time I -- recognizing myself for five minutes.

Ms. Hoffman, as you stated in your testimony, President Biden has established a mission in climate and clean energy goals. These goals which closely align with the committee's climate plan, the CLEAN Future Act, involve a -- power center and emission-free economy by 2050. In your learned opinion, how will the development and employment of transmission infrastructure support the achievement of these goals?

*Ms. Hoffman. Thank you, Congressman, for the question. The benefits of transmission is very broad in nature. It will support the clean energy deployment, but it will also support the reliability and resilience of our nation's infrastructure. With respect to clean energy deployment, transmission will allow us to access remote renewable resources, bringing those resources from remote areas to cities and the demand centers. With respect to clean energy, it will allow us to access all forms of clean energy, including nuclear energy, and best be developed where they are most promising.

*Mr. Rush. Ms. Hoffman, as you know, the Biden-Harris Administration's Justice40 Initiative is a plan to invest 40 percent of climate-related funding into undisturbed and

disadvantaged communities. What is the Department of Energy's plan to incorporate the Justice40 initiative in its work to deploy electric transmission?

*Ms. Hoffman. Thank you, Congressman. Justice40 is a very important activity that really takes a look at communities and ensuring that communities are not affected by transmission or projects that will disadvantage communities. And 40 percent of the benefits must flow to those disadvantaged communities. The secretary has made this a priority as part of the administration and part as the department. She created an Office of Energy Justice. And I do look forward, as we implement transmission projects in the United States, that we concentrate on providing services to disadvantaged communities but also participate in economic development.

*Mr. Rush. In terms of your economic development, does this -- and can you elaborate on the business opportunities that might emanate from Justice40 and also job creation opportunities. But I am particularly interested in creating or -- and/or expanding minority businesses using this --

*Ms. Hoffman. So thank you, Congressman. As we look at building transmission in the United States, it will be a job creator and such that we hope to engage construction jobs, jobs in the utility workforce, and jobs in the service industries. And this provides an opportunity to really

access all forms of workers, local community engagement and transmission projects. And so this effort will really hopefully continue to build that economic development in states and regions, allowing for continued economic growth and jobs.

*Mr. Rush. Ms. Hoffman, how does it -- when the Department of Energy view its role in advancing the deployment of electric transmission and, to be more specific, how will it work with other agencies toward these ultimate goals?

*Ms. Hoffman. Thank you very much for the question. The department actually has several programs and authorities for implementing transmission. Some of the programs really start out from a financing perspective. We have authority through the Loan Program Office as well as through the WAPA transmission infrastructure investment program to finance and to put borrowing authority for transmission projects.

In addition, the department also provides technical assistance to the states as well as coordination of permitting across the federal agencies. One example of how the department is collaborating and coordinating with other federal agencies is the President's goal for offshore wind. The President has a goal of 30 percent -- 30 gigawatts of offshore wind by 2030. And this is a partnership between the Department of Energy, Department of Commerce, and Department

of Interior looking at the Bureau of Ocean Energy Management, BOEM, to really look at transmission development offshore in the United States.

In addition, the Department of Energy, in partnership with the Department of Transportation, is looking at the opportunities for transmission right of ways, and that has been identified as a significant opportunity to minimize some of the permitting challenges moving forward as we look at siting transmission lines.

*Mr. Rush. Well, thank you, Ms. Hoffman. And that concludes my time. And I now yield to my good friend and colleague, the gentleman from Michigan, the ranking member of the subcommittee, Mr. Upton, for five minutes.

*Mr. Upton. Well, thank you again, Mr. Chairman. Ms. Hoffman, again, thank you for being with us today. You know, I think we are all concerned about the process for building new electric transmission. I think many of us would say that it is painfully slow, can take a decade or more to get through all the regulatory hurdles, environmental permitting.

So as you think about some estimates that we got to triple the size of transmission system by 2050 in order to - to get to where -- where people want -- might want to be. As we look to modernize the electric grid and expand the transmission system, I want to make sure that the planning decisions are driven from the bottom up by state and locals

rather than federal mandates. So as you look at this, the CLEAN Future Act, I don't know if you have examined Section 220, which would mandate states and utilities to place their transmission under the control of RTOs and ISOs. Is that something the administration supports?

*Ms. Hoffman. So thank you. Thank you, Congressman Upton, for the question. I think participation in ISOs and RTOs is really a decision that comes under the jurisdiction of FERC as well as decisions by the state for their participation.

States will have to evaluate the cost-effective benefits with respect to their participation. To the extent possible, the RTOs and markets provide cost-effective and competition. In the electric sector, this is an important consideration. And so the Department of Energy is more than willing to provide assistance to the states as they evaluate and consider their role and their interest in participation of -- in RTOs.

*Mr. Upton. Well, I know that you just mentioned that have a dramatic increase in offshore wind. It's probably going to require -- what -- thousands turbines, wind turbines?

*Ms. Hoffman. Potentially. I --

*Mr. Upton. Yeah.

*Ms. Hoffman. I will have to --

*Mr. Upton. I --

*Ms. Hoffman. It's 30 gigawatts.

*Mr. Upton. You got the number.

*Ms. Hoffman. So it's a lot.

*Mr. Upton. So I -- I just -- I mean, what's the expectation on -- you know, it's -- you see regionally. You look at California in terms of, you know, what's going on with the -- with the fires. You look at some of the opposition by different groups that are out there in terms of new lines to be built. You know, how in the world are we going to get to that number, increasing the -- triple the size of the transmission size and look at, you know, these new technologies when, in fact, the current siting, you know, it's -- it -- it's hardly a hard knife through butter as we try to cut through these regs to try and get them done. How can you help us?

*Ms. Hoffman. So interregional transmission is difficult. And it is going to work --

*Mr. Upton. Been impossible.

*Ms. Hoffman. Near impossible. It is going to require close coordination with the states. It's going to require a multi-pronged strategy from my perspective in order to achieve some of the goals that have been presented by the President. We really need to upgrade the existing infrastructure in the United States so increase capacity and

efficiency on the transmission system. We have to look at utilizing existing rights of ways, and we have to think about a national plan for interregional transmission projects and really look at the states and what they have done for their 10-year plans. But also, how can we integrate that so that we actually can address transmission across the United States? So it will require our collaborative approach and a collaborative process with the states to think about the transmission needs where we'd like to develop the next generation clean generation resources and how to get all that built in a holistic fashion.

*Mr. Upton. Well, I'd like to think that, you know, the infrastructure bill that's a lot of different proposals that are out there, but I would like to think that the one that ultimately gets signed, it will have bipartisan support, would include resources to -- to help the resilience of a grid, not only electric but also with -- with gas in terms of pipelines to make sure that we see that happen.

Does it -- department support Section 213 of the CLEAN Future Act which creates a federal siting program for electric transmission, and would you support the same for gas transmission?

*Ms. Hoffman. So a federal siting program is really under the jurisdiction of FERC from their capabilities and their experience with respect to siting pipelines and

transmission lines. From the Department of Energy's perspective, what we really want to do is actually collaborate with the states to think about where transmission should be built. And in that dialog, we are hoping that we'll be able to facilitate constructive conversations on how to best site transmission lines. What are some of the alternatives for siting transmission lines such as non-transmission alternatives? And so that technical assistance that we could provide as part of the conversation would be very important in leading to some of FERC's conversations from a siting perspective.

*Mr. Upton. Well, I know my time has expired, but I just hope that the department could work with us as we try to get through this nightmare of regulatory burdens that will really prevent us from expanding transmission and nowhere get close to the -- tripling the size of the transmission system by 2050 without those reforms. And with that, Mr. Chairman, I yield back.

*Mr. Rush. The gentleman's time has expired. The chair now recognizes the chairman of the full committee for five minutes.

*The Chairman. Thank you, Chairman Rush.

Ms. Hoffman, in your testimony, you not only address transmission's role in achieving a hundred percent clean economy, but you also state that transmission can protect the

grid against climate induced extreme weather. So can you elaborate on the role that transmission plays in protecting the grid against extreme weather and in maintaining the reliable delivery of power to U.S. homeowners and businesses?

*Ms. Hoffman. Thank you, Congressman. It's really important as we build transmission to recognize that modernizing our electric grid is important to reliability and resilience. In the electric sector, transmission but also other grid modernization technologies has been helpful, very helpful in the past as we looked at our response to emergencies when you look at sensors on the transmission system, outage management systems.

But specifically you asked about transmission. Transmission really -- what that does is it allows power flow when power is available in one region of the country but may not be available to either weather issues or extreme weather issues that have occurred in the United States. So what transmission does is it allows us to utilize that diversity of generation across the United States to support outages.

*The Chairman. And then -- well, thank you. As my home state of New Jersey learned during Superstorm Sandy and -- and other states such as Texas have learned more recently, it's critical that we have a reliable transmission system that can withstand climate change-induced extreme weather events. You also provided recommendations for the committee

on barriers to transmission development. And one of those recommendations is to increase the use of our existing system in the near-term using advanced transmission technologies, among other things.

And in the CLEAN Future Act, we include a provision that supports deployment of such advanced transmission technologies as well as non-transmission alternatives. So going forward, what additional policies would support the efficient use of our existing transmission system, and what role could the DOE play in supporting the deployment of these important technologies, if you will?

*Ms. Hoffman. Thank you, Congressman. Transmission technologies and grid-enhancing technologies, as well as non-transmission alternatives are really important tools and policies that can be utilized in support of our nation's infrastructure. So technologies such as energy storage, technologies as energy efficiency are all part of the holistic picture that one needs to consider as we invest in the future of the United States. So as I look at it, it's better utilizing the capacity on existing lines. It's deployment of energy storage. It's looking at energy efficiency measures, demand response measures. All these will play an important contribution. And the policies that are driven by the states in emphasizing the need for whether it's demand response technologies and energy storage will -

will aid in that conversation.

*The Chairman. Thank you. I have one more question. And in your written testimony, you also describe the important role that DOE plays in coordinating federal authorization decisions on electric transmission facilities, including environmental reviews. And the CLEAN Future Act proposes that DOE establish a transmission siting assistance program to assist states, localities, and tribes in their efforts to study and site new transmissions. So do you think DOE, through this proposed transmission siting assistance program, can play an effective role in facilitating the siting and development of additional transmissions?

*Ms. Hoffman. So siting is a challenging issue. And technical assistance to the states is an important area in which the Department of Energy can add value to the conversation. With respect to siting, technical assistance and incentives could be provided to look at cost-benefit analysis, look at where alternative routes can be done, can also look at evaluating non-transmission alternatives as we just discussed. So providing that technical assistance will allow the states to really evaluate the potential benefits of transmission projects and looking at how we invest collectively in our transmission moving forward.

One of the things that the coordination and siting would allow would be a greater collaboration and discussion on

interregional transmission projects. And that is really where some of the challenges occur, is really doing multi state projects and interregional projects.

*The Chairman. Well, thanks again for your response to the questions, and we really look forward to working with you in DOE as we try to pursue our clean energy goals. It's so important. Thank you. I yield back, Mr. Chairman.

*Mr. Rush. The Chairman of the full committee yields back. The chair now recognizes the ranking member of the full committee, Ms. McMorris Rodgers, for five minutes.

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

Ms. Hoffman, I believe very strongly in the importance of diverse supply to meeting our energy needs, the importance of an all-of-the-above approach to energy. You know, just -- just earlier this year in February, we were without electricity for several days in Spokane, and I was reminded how great it was at the time when electricity was out that still the natural gas stove worked in our house, and we could -- we could cook and having a car battery to charge some of our other devices came in handy. But I -- I just wanted to ask about the importance of hydroelectric -- hydroelectricity in particular in the Pacific Northwest and in state of Washington. It's really important baseload. It's affordable. We have some of the lowest electricity rates in the country because of hydropower. And as we continue to

move with more wind and solar, it is -- it's that important baseload that we so -- we need.

I noted in my testimony that the Four Lower Snake River Dams came to the rescue this winter during a deep freeze when we had lost access to the Chief Joe Dam on the Upper Columbia River. And they stepped up to provide that energy that we needed. So I wanted to ask would you speak to the importance of hydropower, especially on the Lower Snake River, and for electric reliability and emergency use?

*Ms. Hoffman. Thank you, Congresswoman. Hydropower is a very important asset as we look at providing generation that will provide flexibility moving forward. We have to have generation that can support the variability of renewable energy. And hydropower in the West is one of the key resources that provides that flexibility and variability. And so having hydropower assets are a very important part of our portfolio from a system reliability perspective, recognizing that we do need diversity of our generation assets. As you have pointed out, there is drought conditions in the West, which is putting great stress on our hydropower system. And so as we move forward, we need to think about investment in energy storage technologies and other technologies that will continue to support the system moving forward. But hydropower as a core element is a -- is a very important --

*Mrs. Rodgers. Thank you.

*Ms. Hoffman. -- generation resource.

*Mrs. Rodgers. Part of expanding access to hydropower and updating the -- the federal licensing requirements?

*Ms. Hoffman. So I think that's an important conversation that the Department of Energy should have with Congress on the value of hydropower and hydropower expansion. Some of the programs within the Department of Energy is how do we maximize utilization of the existing hydropower fleet that we have with respect to whether it's more power through the turbines, more efficiency investments in the hydropower assets. But I do look forward for the department having further conversations with the right folks on the hydropower relicensing.

*Mrs. Rodgers. With the buildout of the weather dependent wind and solar, I think hydropower, again, is stepping up and is really ideal for a black start. With plans to interconnect with more renewables into the grid, how important are attributes like black start capability in the event of a major power outage?

*Ms. Hoffman. Black start capabilities are very important as well as, I would say, essential reliability services, which really includes ramping services and other forms of support for the system. So hydropower is a very important contribution to black start capabilities for the

United States.

*Mrs. Rodgers. Thank you. I wanted to ask a general question about DOE's own assessments of transmission delays. In 2016, DOE issued a report on issues delaying transmission siting. It noted that NEPA processes involving multiple agencies raise a lot of institutional issues that can raise costs and delays for final approval. Would you tell us if anything has changed with regard to the interagency coordination since DOE issued the report in 2016?

*Ms. Hoffman. Since 2016, I would say that there is a greater appreciation of the need for coordination among the federal agencies for transmission permitting in the NEPA processes. There has been a permitting dashboard and a federal interagency permitting steering committee that really has taken a hard look at some of these NEPA coordination issues. Would I say that it's perfect? No. There is a lot of institutional and agency authorities that still could use better coordination. But it is a work in progress, and it's something that we really need to focus on moving forward if we are going to make a difference from a permitting point of view.

*Mrs. Rodgers. Well, I appreciate you highlighting that because permitting is -- is a key challenge to meeting these needs that we are going to have for transmission capabilities. And with that, I'll yield back. Thank you,

Mr. Chairman.

*Mr. Rush. The ranking member yields back. The chair now would like to recognize the gentleman from California, Mr. Peters, for five minutes for the purpose of questioning the witness.

*Mr. Peters. Thank you, Mr. Chairman. This -- this is what I wanted to ask about too, is that in your written testimony, Ms. Hoffman, you recommend that Congress look for ways to accelerate developers' ability to site, permit, allocate costs, and build. Can we achieve the administration's 2035 clean electricity target without authorizing FERC's backstop siting authority, leaving it to states and the way it is now in this kind of patchwork way? Doesn't the federal government need to step in and help that process work?

*Ms. Hoffman. So Congressman, thank you for the question, and I think it's a very important question. The - Energy feels that we can do a lot with the existing authorities that we already have from the loan guarantee programs and the WAPA TIP programs to getting transmission built to deploy new technologies, to expand the capacity on the existing system. The department also believes that through an integrated transmission planning process, we can advance how we should look at and build high-voltage transmission moving forward in a collaborative fashion with

the states.

The department also recognizes there is strong movement within the states. As we look at numerous states, I believe 19 states have net zero targets as well as there are other states out there that actually require utilities to invest in clean energy. So I feel there's a lot of movement with the existing authorities that can be utilized as coordinated and facilitated by the department and other agencies to move and meet some of the objectives.

*Mr. Peters. Do you not think it would be helpful to have backstop authority? Because what we have, we have a system now that designates these corridors, and nothing has been built.

*Ms. Hoffman. So I think the challenge really comes down to when there is disagreement with the states --

*Mr. Peters. Right.

*Ms. Hoffman. -- in interregional transmission projects that have more than one state engaged. So at the end of the day, there are a couple options that Congress can consider moving forward. It's really looking at the state compacts provide value in getting transmission built from a collaborative point of view, and can we be successful from a bottoms-up approach in building transmission? Some of the state technical assistance are opportunities and really getting some of those multi-state projects built. And then

ultimately, it would require a decision to say do we need this transmission line if there is disagreement among the states.

And I think the most important thing is having some sort of certainty in which some of the -- the bills that have been proposed will allow for an ultimate decision process and an ultimate decision to be made on a transmission project versus, I think, the back-and-forth that continues to go on delaying the building of interregional projects.

*Mr. Peters. Right. I think, as you have outlined for purposes of not just renewable energy but for reliability and for cost, there is a national interest in interstate transmission. Don't you agree with that?

*Ms. Hoffman. Yes, there -- there is a need for interregional transmission just to support the seams in the United States. You look at the event that has occurred with the polar vortex in February, of strengthening those seams that are important but also just getting generation from remote areas of the country, clean generation to the demand centers. And so that's what we really need to think about from that perspective in a support -- in addition to supporting a strong grid, which really means capacity that will allow for reliability during emergency events.

*Mr. Peters. Capacity, reliability, security are all things that we are concerned about in this committee, and I

would also say that I am -- I agree with many of my colleagues, Republican colleagues, that permitting sometimes gets in the way. Here is a place where permitting has not established this nationwide network that I think we all agree we need. So that is why we introduced the POWER ON Act to help DOE achieve those goals. We'd ask you to take a look at that and -- and we think that if it is in the national interest, we should give states and tribes and localities and interest groups the chance to work this out on their own.

But also, they should know that if they don't that the federal government would have the ability to come back in and do it. So that's a -- I think would be useful in helping you achieve your goals and all of us achieving our goals as well. Thank you, Mr. Chairman. I yield back.

*Mr. Rush. The gentleman yields back. The chair now recognizes the gentleman from Ohio, Mr. Latta, for five minutes.

*Mr. Latta. Well, thanks, Mr. Chairman, and first I want to thank the witness for being with us today. It's great to actually see a witness before us and not on-screen. So it's great to have you with us today. Really appreciate that. In your testimony, you spoke about enhancing grid reliability and resiliency through a robust transmission system. You also touched on transmission, how it can help with extreme weather events, environmental justice and

economic development.

One area that you didn't touch on that I think is really important to talk about, and we know how important it is. I know I have worked on issues with my good friend from California, Mr. McNerney, on these, you know, improving the resiliency of the grid when we are talking about cyber-attacks. And I think it's important that that's one of the points that we need to really be looking at. And so the incentives in the CLEAN Future Act are geared towards the integration of renewable resources of energy over the coming decades.

But consumers will be immediately impacted through the electric grid if it's brought down by cyber criminals. Wouldn't you agree that the top priority should be preventing a household from being without power during a heat wave or cold front due to a cyber-attack?

*Ms. Hoffman. So thank you, Congressman Latta, for the very important question. As you know, I have had plenty of experience, and I don't usually do a presentation without bringing up the cybersecurity issues. So I do believe cybersecurity is very important to address as part of building infrastructure and building in security measures as we develop clean energy or as we deploy new technology that the department has. We recognize that we must build in cybersecurity. We must test our supply chain components to

ensure that they are analyzed for vulnerabilities and mitigations are in place.

And we know we need to build a comprehensive workforce and I would say a new business, you know, enterprise in the United States to address cybersecurity issues. So they need to go hand-in-hand. As we develop any technology, we must consider some of the cybersecurity vulnerabilities, address the cybersecurity issues, and have that as part of the conversation.

*Mr. Latta. Let me follow up what you just said because you said that we are -- we need to, you know, build this up in the United States and make sure that we are doing what we have to do to protect ourselves. Do you have, like, a time frame because I know you -- it's -- when I have talked at different universities and schools in my district, one of the things that, you know, they always ask me if you are going to develop a new program, would it be -- and several years back, I said cyber. It's so important that we are there today and to be there.

But when you are looking at -- from your seat and, you know -- and building this up across the country and knowing the attacks -- the millions of attacks that we are experiencing in this country, how fast can we get that built up to be able to be, you know, on the cyber side that we can protect ourselves?

*Ms. Hoffman. So I think it is partly -- I would say the relationship is dependent on how much resources is put - that is put towards cybersecurity issues. And I think the balance is companies, businesses, universities really need to think about how do they want to change and institutionalize a culture of cybersecurity as they develop their products, as they do their business models. And I think the ransomware attacks of recent have really identified the emphasis that our -- that is needed from a business point of view to really take a hard look at cybersecurity, look at their cybersecurity maturity level.

There are tools out there with respect to the NIST cybersecurity framework and standards that are out there in the electric sector for building up cybersecurity. So I think it is all part of a culture that we need to change in the United States.

*Mr. Latta. Well, let me ask this. You know, looking not just with -- from outside, what can we do here in Congress in reviewing, in a bipartisan manner, ways that we can prioritize hardening the grid against the cyber-attacks? What can we be doing right now?

*Ms. Hoffman. So I think some of the efforts that really continue to be emphasized around Congress and also just a part of the community and industry writ large is building in cybersecurity and making sure that, as

technologies is developed, cybersecurity is built in that technology as well as the components and devices are tested for cybersecurity vulnerability, that businesses have, what I will say, a quality assurance practice in place that they actually test their components.

They collaborate with the agencies such as the Department of Homeland Security, the Department of Energy for intelligence information. And they look at continuing to build that partnership. Those are some of the areas that I think are really important. The last area I would say is monitoring of systems. To really understand your own network, you look at the hundred-day plan that was announced by the administration. Really emphasizes monitoring of business and networks. And that is another important characteristic that would be useful.

*Mr. Latta. Well, thank you very much, Mr. Chairman. I yield back the balance of my time. My time has expired.

*Mr. Rush. The gentleman's time has expired. The chairman now recognizes the gentleman from Pennsylvania, Mr. Doyle, for five minutes.

*Mr. Doyle. Well, thank you, Mr. Chairman, and Assistant Secretary Hoffman. Welcome and thank you for being with us today. You know, as we continue to build a cleaner energy system, we need to ensure that all of the new sources of energy can be safely and efficiently moved around. Our

transmission infrastructure, it's rarely mentioned when we talk about the future of the energy grid. But it's probably the most critical piece.

That's why we have to invest in upgrading the system and ensuring it has the capacity to expand. The growth of renewables has only made building transmission infrastructure more important, given that they are intermittent, and it is produced in different regions at different times. I mean, power needs to get where it is created to where it is used in the most efficient way possible in order to provide low-cost energy to consumers.

So a transmission buildout will enable us to take wind from the Plains and geothermal heat from the Southwest and hydropower from all across the country to where it's needed. And it will not only enable us to make the most efficient use of our energy sources but also ensure that customers are getting the most low-cost form of energy.

So I was pleased to see the administration including building transmission infrastructure in the American Jobs Plan. And I hope we can move on my colleague's bills that will allow us to decarbonize the grid more efficiently while providing good jobs.

Now, I know Chairman Rush already touched on how new transmission infrastructure helps us get more renewables on the grid and how it can give us opportunities for jobs. But

another significant piece to bringing more renewables onto the grid is energy storage. And how do you see energy storage and the transmission system working together to maximize the efficiency of the grid?

*Ms. Hoffman. So thank you very much, Congressman. That is an extremely important question as we look at the need for flexible generation in the United States. Energy storage is a key technology that allows for that flexibility. It provides different services of support for system operators from frequency regulation to ramping services. The need, I think, and energy storage technology development is really getting more towards that long duration energy storage going from eight-hour energy storage to 10 hours plus of energy storage.

And I think that will provide the most flexibility for the system moving forward. But energy storage is a key component of the portfolio because that allows for that firming of variable generation in the United States.

*Mr. Doyle. Yeah. Thank you very much for that.

Well, Mr. Chairman, since Chairman Rush addressed two of the other questions I had for the assistant secretary, I will yield back two minutes and 11 seconds, and we'll -- this moving.

*Mr. Rush. The chair certainly appreciates the kindness and generosity of the gentleman from the great state of

Pennsylvania.

Now the chair recognizes the gentleman from West Virginia, my good friend --

*Voice. He's good.

*Mr. Rush. -- McKinley for five minutes.

*Mr. McKinley. Thank you, Mr. Chairman. And Ms. Hoffman, welcome back. It's good to see you in person again. But you made a -- you -- and earlier, you made a statement about the environmental justice issue. And I just wanted to touch on that just a little bit to see just where DOE is on that because you brought it up. And that was -- in their report, they say that this council is -- is in opposition to carbon capture, direct air capture, nuclear power, R&D. They are opposed to road improvements, pipeline expansion. Does DOE -- do you -- do you support this report?

*Ms. Hoffman. So Congressman, thank you for the question. I will be honest. I don't --

*Mr. McKinley. If you could, just --

*Ms. Hoffman. -- know.

*Mr. McKinley. -- a yes or a no because I have got other questions. You raised this question --

*Ms. Hoffman. I -- I --

*Mr. McKinley. -- so I am just trying to get back to it quickly.

*Ms. Hoffman. I don't know the details of all those

aspects that that report is sponsoring.

*Mr. McKinley. Okay. I couldn't hear what your answer was. I am sorry. Now let me go further with it. We have already had -- so we are pivoting to a hundred percent renewables, and that's a good thing. I don't have a problem with that. But it is also going to involve, as you testified, the thousands of miles of more transmission line.

I am just curious about as we pivot away from fossil fuels under this scenario, we have already had people testify for the American Action Forum and the IER, the Institute for Energy Research. You have already said that electric rates for consumers are going to go up 2- to $4,000 a year. And Energy Future Initiative is already saying that it's going to cost thousands of jobs in Wyoming, North Dakota, Ohio, West Virginia, Pennsylvania, Alabama, and states all across the country, that it's going to cost jobs as we -- as we do this and switching over. And then we have already talked about the global CO2 levels, that they are not going to drop below where John Kerry said 350. Anything above 350 is a dangerous level. So we are not going to drop below that. And we have had testimony here that says even if we go to this hundred percent renewables, we are still going to have wildfires, droughts and -- and -- and wildfire and -- and flooding. I am troubled with this because our objective, all of our objectives is to reduce the greenhouse gases in the

atmosphere. But to do that, we -- can't we rely on our science, our community to do this? We did this back in the '60s when President Kennedy said he wanted to put a man on the moon, and within 10 years, we did it.

And then two years ago or a year ago when President Trump developed a vaccine or called for a development of vaccine, it happened within 10 months. So we have trusted our scientific community. I don't understand why we are exploring -- advocating through the administration, advocating the abandonment of fossil fuels when we see all the consequences that are -- job losses. The environment is not going to get any better. Our rates are going to go up. I don't understand it. Why aren't we -- why are we dealing with using our science to develop carbon capture. It's pretty fundamental with it. If we can get to this issue, for those interested in reducing greenhouse -- and for see a zero emission, I am with you on that goal. Shouldn't we be advocating for a hundred -- hundred percent emissions rather than a hundred percent of abandonment of fossil fuels across this country because we know the job impacts that's going to have and the rates is going to -- the impact it's going to have. And it's really not going to clean up the global environment. Why don't we invest in carbon capture? Why aren't you doing more on that?

*Ms. Hoffman. So thank you, Congressman, for the

question. As we look to go to a decarbonized society, we are going to have to tap all that science can offer with respect to development of carbon capture and storage, CCUS as part of the portfolio, nuclear energy as well as the deployment of clean energy technologies. Doing nothing is not an option as we move forward. We really need to think about those technologies.

*Mr. McKinley. I don't think anyone is saying do nothing. Why you think we -- you are saying do nothing?

*Ms. Hoffman. I just think we need to be more aggressive as we think about the technologies moving forward and what we can invest in now as well -- while we are doing the science and investing in capabilities for CCUS and to decarbonize our energy generation portfolio.

*Mr. McKinley. Running out of time, so thank you for your -- your testimony, and I yield back the balance of my time.

*Mr. Rush. The gentleman yields back. The chairman now recognizes the gentleman from the great state of California, Mr. McNerney, for five minutes.

*Mr. McNerney. Well, I thank the chairman. I thank the witness for your expert testimony. You have been doing this for a long time. The -- in your testimony, you discussed existing authorities that the DOE currently has to facilitate the expansion of the transmission system such as Section 368

of the Energy Policy Act of 2005. Can you discuss the extent to which this program has been utilized in the past and how we can help ensure that it is used to help overcome some of the siting and permitting challenges that we are seeing for large transmission projects?

*Ms. Hoffman. So, yes, thank you. So a lot of the coordination with respect to federal siting does occur under 216(h) of the Federal Power Act. And what that does is allow the Department of Energy and enables the Department of Energy to coordinate with other agencies on the permitting of transmission projects. In addition, Section 368 allows for the development of energy corridors on federal lands, which also will enable some of the, I would say, advancements of transmission.

So the Department of Energy has worked in the past on both of these authorities to allow for federal coordination as well as energy corridor development in -- in -- with these authorities.

*Mr. McNerney. Thank you. Well, in the CLEAN Futures Act as well as the American Jobs Plan, new authorities are introduced for the Department of Energy to expand the transmission systems even further. In particular, the American Jobs Plan announces the creation of a grid deployment authority which will help support the use of existing rights of way and other things. Can you discuss how

the grid deployment authority could be used to support the goals of the CLEAN Futures Act?

*Ms. Hoffman. Yes. Thank you, Congressman, for the question. With respect to the grid development authority that was proposed under the American Jobs Plan, what it is, is a way to really centralize and focus the Department of Energy's authorities with respect to financing transmission projects to coordination among the federal agencies to providing technical assistance. What that allows us to do is really emphasize and pull together all the authorities that the department has to really put a strong emphasis in moving things forward and getting projects done.

*Mr. McNerney. Well, thank you. In your testimony, you state that wildfires pose an increasing threat on the country's electric infrastructure and that the Office of Electricity has been taking steps to educate utilities and offer capabilities. Each year, my district is forced to confront and prepare for increasing destructive wildfires. Drought, poor air quality and power outages are now expected to be intensified by climate change. Can you elaborate on what capabilities and technical solutions are available to deal with this new normal?

*Ms. Hoffman. Thank you, Congressman. Wildfires is an ever-growing and more serious issue that the states are experiencing, especially with extreme drought conditions that

the West is experiencing. Utilities are very focused on wildfires. The secretary has been consulting and discussing the wildfire concerns with utilities in the ISOs in the regions. The Department of Energy in April held a series of workshops with utilities highlighting some of the technical capabilities that the national labs have to offer. But with respect to wildfire, wildfire management, vegetation management is always core component.

But in addition, DOE is looking at technologies such as sensors to help identify when faults occur on the system, to help clearly identify areas from an asset management point of view that can prevent wildfires. They are also -- we are also looking at artificial intelligence and machine learning to better quickly identify wildfires but also conditions, ground conditions that would enable wildfires to grow quickly versus being able to tackle them and manage them as soon as possible.

*Mr. McNerney. Right. And so advanced -- will help in that regard as well --

*Ms. Hoffman. Yes. Asset --

*Mr. McNerney. -- in my --

*Ms. Hoffman. -- management, advanced components, upgrading the infrastructure all would help from that perspective as well as managing the loading on transmission lines.

*Mr. McNerney. Well, we often hear about the weather dependency of renewable energies. How much is this intermittency diminished when renewables are distributed over a broad geographic area?

*Ms. Hoffman. So thank you very much for the question. As renewables are deployed across a wider geographical area, that time variation provides the flexibility with respect to managing that variability. So having a diversified geographic set of renewables will provide a level of -- a level of support to the system in managing that variability.

*Mr. McNerney. Well, thank you for your testimony. I yield back.

*Mr. Rush. The gentleman yields back. And now the chairman recognizes the gentleman from the great state of Illinois, Mr. Kinzinger, for five minutes.

The chair, seeing Mr. Kinzinger has no light on, meaning the chair now recognizes the gentleman from Virginia, Mr. Griffith, for five minutes.

*Mr. Griffith. Thank you very much, Mr. Chairman, and I appreciate it. And thank you for being here today. Earlier today, apparently just in time for this hearing, Chairman Pallone issued the following statement. "I am deeply disturbed and disappointed by the Supreme Court's decision today, which sets the dangerous precedent of allowing interstate pipelines to take state-owned land without a

state's consent.'' New sentence, "States like New Jersey should be able to retain their right to do what they wish with the lands they own, and no private actor, including pipeline companies, should be able to usurp that right. I am determined to work with my colleagues to do everything in our power to preserve this important state right.''

Let me reiterate now using my slight modification of his to say that he has said that states like New Jersey should be able to retain their right to do whatever they wish with the lands they own, and no private actor should be able to usurp -- usurp that right. Does DOE agree with Chairman Pallone on this issue?

*Ms. Hoffman. So, Congressman, thank you very much for the question. The siting of pipelines is not under my jurisdiction or the Department of Energy's jurisdiction. Siting is generally in the responsibility of the states as states look at technology -- I mean, as infrastructure investments.

*Mr. Griffith. All right. How about the electric transmission? No private actor, it says, should be able to have this right. Do you agree that -- that the no private actor, including electric transmission lines, should be able to use eminent domain to take the state's property.

*Ms. Hoffman. So with respect to transmission, transmission is -- siting is under the jurisdiction of the

state and under FERC. And so once again, with respect to building transmission in the United States, it is a collaborative process looking at the state's needs and the state's capability from a siting point of view. The Department of Energy focuses on the permitting aspects of transmission and planning. Part of our technical assistance would be to support states in evaluating transmission in --

*Mr. Griffith. But some of the bills that we are working on would change the rules on that. Am I not correct?

*Ms. Hoffman. I would say that under the CLEAN Futures Act, there is some -- there is modifications in the CLEAN Future Acts that are focused on FERC and FERC's authorities.

*Mr. Griffith. And -- and I would have to agree that FERC needs some reform. Earlier, if I understood you correctly -- and correct me if I misunderstood -- you indicated that one of the ways we might be able to build this huge amount of high-voltage electric transmission that we are going to need would be to use existing rights of way such as highways, existing electric lines and Amtrak. Was I correct in hearing you?

*Ms. Hoffman. Yes, Congressman.

*Mr. Griffith. Okay.

*Ms. Hoffman. That is --

*Mr. Griffith. So --

*Ms. Hoffman. -- the opportunity.

*Mr. Griffith. So here's the question I would have on that. Without some significant reform at FERC, we are not going to be able to co-locate because I tried to suggest to them they look at two pipelines that were being run through Virginia. And they said they didn't have that authority to co-locate.

Now, let me go one step further. And I am not going to ask you a question on that. I am just stating. They claim they don't have that authority. So we may have to do -- give them that authority. But then if you are doing it on, let's say, Amtrak, Amtrak doesn't own a very wide easement in most of its lines. And in many cases, it runs on private rail lines. Isn't that true?

*Ms. Hoffman. So I am not as familiar with the --

*Mr. Griffith. The answer is yes it is.

*Ms. Hoffman. -- structure of Amtrak.

*Mr. Griffith. All right.

*Ms. Hoffman. Okay.

*Mr. Griffith. So -- but for an electric power transmission line, particularly a high-voltage one, you would need at least, what, 150 to 300 feet? So Amtrak is not going to work. How about our interstate highways? Are they going to be 300 feet wide in most places? I guess the interstates would work but not U.S. Highway corridors or highways because they -- the corridor is big, but the easement is not. And I

would be correct on that. Would I not?

*Ms. Hoffman. Yes, you would be correct, Congressman.

*Mr. Griffith. So that's not going to work. If we can't take state property and we can't locate, so the only thing we have got left is locating where there's already a high voltage transmission line on those items we were talking about earlier. How do you envision that? Would we have double-decker lines, ones that -- much higher than the others? How are you going to put two high-voltage power lines in the same easement?

*Ms. Hoffman. So thank you, Congressman. I think this is really part of the planning process in discussion with states as well as Department of Transportation --

*Mr. Griffith. But right now, you don't know --

*Ms. Hoffman. -- how to best --

*Mr. Griffith. -- is the answer. You know don't how you are going to work that.

*Ms. Hoffman. It would be a transmission planning process that would have to be evaluated and individually with projects.

*Mr. Griffith. So here's my concern. We are talking about 2030 having 50 percent -- or reducing emissions by 2030 by 50 percent and 100 percent by 2050. But by the time we get through the planning process, we get through all the litigation, we comply with all the regulations, one of our

previous witnesses said it was likely to take more than 30 years. Can't be done. Let's quit selling the American people a false promise. I yield back.

*Mr. Rush. The gentleman yields back. The chair now recognizes the chairman of the Subcommittee on Environment, the gentleman from New York, Mr. Tonko, for five minutes.

*Mr. Tonko. Thank you, Chair Rush and Chair Pallone for your work to add meaningful transmission provisions to the CLEAN Future Act. And welcome back, Assistant Secretary Hoffman. Been here before, and thank you for always sharing your expertise with the committee and subcommittees.

This is certainly a tough and complicated issue, but it is critical we get this right because we will need new transmission capacity, particularly interstate and interregional projects to achieve our clean electricity targets.

According to recent studies, we may need about 70 new gigawatts of clean electricity added to our energy mix every year over the next 15 years and last year. I am informed that we deployed less than one half of that. Nearly all of these projects will require extensive planning, siting and permitting processes and at the current rates transmission projects to enable this buildout are being developed far too slowly. The good news is that I believe this work can be bipartisan. Addressing barriers to transmission deployment

played a big role in the Senate's bipartisan infrastructure framework and the President's American Jobs Plan.

So Assistant Secretary Hoffman, thank you for your testimony. Obviously, I come at this issue with an interest in deploying new clean electricity resources. But new transmission can provide many other benefits. Can you explain how many of these projects could actually result in cheaper electricity and a more reliable and resilient grid?

*Ms. Hoffman. Yes. Thank you, Congressman, for the question. As we build transmission, there is efficiency of building at scale and allowing for the access to high capacity renewable resources across the United States. So part of the -- the process for looking at transmission is really having that high-voltage capacity but that additional capacity to tap that -- remote renewable resources that can be developed in a cost-effective manner.

*Mr. Tonko. Thank you. And when we talk about interregional planning, we often think about a project in the Wind Belt supplying PJM or California. But I think it's important that we don't forget offshore resources. These offshore projects are going to feed into New York's ISO, ISO New England and PJM. How should RTO's transmission planning account for the significant expected growth in offshore wind deployment?

*Ms. Hoffman. So thank you, Congressman. I think it is

an important dialogue that must be had with the ISOs and the RTOs as we think about transmission planning moving forward. They generally do a 10-year transmission plan. But the ISOs and RTOs really need to think about scenarios moving forward so that they can build towards the future and the policies, whether it's the state policies and the federal policies from a transmission planning perspective. And that needs to be part of the discussion as well as they look at resilience attributes and making sure that we strengthen the transmission system moving forward. So they have an important role to play as they do, do transmission planning and they do, do some scenario analysis.

*Mr. Tonko. And what role can DOE play in helping states better coordinate and cooperate around this massive opportunity for offshore wind?

*Ms. Hoffman. So states have a very important role. The states along the East Coast really need to be part of the dialogue as we think about the transmission plan for building 30 gigawatts of offshore wind. As we look at that, we want to think about a coordinated approach for radial feeders and where they are connected to the transmission system on the mainland. And so that is an important dialogue of the conversation because system upgrades are going to be required, and all that investment really needs to be collaborated with -- with the states and the affected

communities.

*Mr. Tonko. And DOE, you see in the middle of all of that?

*Ms. Hoffman. DOE can provide the facilitation as well as technical assistance for some of the analysis and support for the -- the transparent and open discussions on how to build the infrastructure.

*Mr. Tonko. And finally, can you provide any examples of work done by the Office of Electricity's transmission planning and technical assistance program? And can this work play a role in the proposed grid deployment authority?

*Ms. Hoffman. So absolutely, and thank you for the question and being able to tout some of our work. Under the Recovery Act, we did sponsor transmission planning activities with the regions to look at different scenarios which I believe was the start of the dialogue as well as some of the FERC orders that came out to say that we need to have a transmission planning process in the United States, evaluate what transmission requirements are needed.

But in addition, the Office of Electricity and our organization has really sponsored the development of several tools that can be used by transmission developers. We have the rapid toolkit, which was done as part of an interagency process that's a Wiki that really allows developers to look at all the regulatory authorities and requirements on a state

basis and a federal basis for building transmission projects. But we also have an energy zone mapping tool that also allows for project developers to take a look at the mapping but really figure out where the sensitive lands are and the opportunities for transmission development and alternative routes.

*Mr. Tonko. Well, thank you again for sharing your expertise. And with that, Mr. Chair, I yield back.

*Mr. Rush. The gentleman yields back. The chairman now recognizes the gentleman from Ohio, Mr. Johnson, for five minutes.

*Mr. Johnson. Thank you, Mr. Chairman, and Assistant Secretary Hoffman. Thanks for joining us today. Today we are holding, at least by my count, the seventh hearing in this Congress on yet another portion of the CLEAN Future Act. It's important to remember that just because we hold these separate hearings, this is all part of the same massive 900-plus-page radical legislation. If enacted, it'll totally transform our society in a negative way, hitting the American economy and our constituents' pocketbooks all at once. This utopian vision mandated by the CLEAN Future Act, a vision of a fully electrified economy with its thousands of miles of new high-voltage transmission and all renewable power generation within 15 or even 30 years at some point is inevitably going to crash into reality. By the best

estimates, wind and solar electricity generation need at least 300 to 400 times the amount of land as, say, a natural gas or a coal-fired power plant. Adding to the problem is that the areas with the most wind and sunlight by and large are not even close to the population centers in our country.

My Democratic colleagues will say today that all we have to do is make a few policy changes here, throw a few hundred billion dollars there and this problem is fixed. Now, I know this sounds funny, but it reminds me of that scene in the '80s movie Back to School where Rodney Dangerfield's college professor asks his student where they should build his theoretical business. The professor clearly had never worked a day in his life and failed to take into account some very real, serious practical realities. Dangerfield's character, already a successful businessman, shouts out, "How about Fantasyland?'' to the professor, bringing laughter, obviously, from the students.

The supporters of this bill need to be honest with the American people. This rush to green, if it becomes a reality, will lead to increased blackouts, skyrocketing electricity costs and out-of-control inflation. So Assistant Secretary Hoffman, would you agree that, in general, when someone makes an investment, they do so with the hope that they get a tangible return on that investment. Is that generally your understanding of what an investment does?

*Ms. Hoffman. Thank you, Congressman. Yes. Investment --

*Mr. Johnson. Okay. Great. In your testimony, you mentioned several times the, quote, investments that you see needing to be made in transmission, a vast buildout of two to three times our current transmission capacity. Someone is obviously going to have to pay for this investment. So whether the American people are stuck picking up this tab via higher taxes or rate increases on their utility bills, can you honestly say that they'll be receiving a return on their investment?

*Ms. Hoffman. As you look at the cost-benefit for the health and safety of communities --

*Mr. Johnson. No. What is the --

*Ms. Hoffman. -- reliability --

*Mr. Johnson. -- return on investment? What is the return on investment? They are making a monetary investment with their taxes or their rate increases. What is the return on their investment?

*Ms. Hoffman. So the return on the investment is access to clean energy. It is access to --

*Mr. Johnson. No. That's not a return --

*Ms. Hoffman. -- available --

*Mr. Johnson. -- on investment. A return on investment is a monetary thing. That's why you make an investment. Let

me ask it another way. If the Biden -- which you touted in your testimony, the carbon-free power sector by 2035 are realized, in your opinion, will the American people's utility bills go down?

*Ms. Hoffman. So with respect to utilization of --

*Mr. Johnson. That's a -- that's a --

*Ms. Hoffman. -- high-voltage --

*Mr. Johnson. -- yes or a no question. If these goals are realized, will those utility bills go down?

*Ms. Hoffman. If we can access clean energy that is cost-effective in the remote areas of the country, accessing the --

*Mr. Johnson. No. Will the --

*Ms. Hoffman. -- low-cost --

*Mr. Johnson. Will the --

*Ms. Hoffman. -- energy --

*Mr. Johnson. Will the utility bill -- Assistant --

*Ms. Hoffman. -- components --

*Mr. Johnson. -- Secretary, you are not answering the question. Will the utility bills go down if these goals are realized? Yes or no?

*Ms. Hoffman. It varies across --

*Mr. Johnson. You don't know. You don't know. That's what I thought. And can you guarantee that their electricity will remain reliable, not only for essential household

functions but for businesses, job creators who need large amounts of reliable electricity for manufacturing and other commercial uses? So will reliability still be what it is today where we have coal, nuclear and gas providing our baseload?

*Ms. Hoffman. Having a strong transmission system will increase the reliability --

*Mr. Johnson. That goes back to --

*Ms. Hoffman. -- of the United States.

*Mr. Johnson. -- the investment part -- right? -- that we don't know if we are going to get a rate of return on. Thank you, Madam Secretary. I yield back.

*Mr. Rush. The gentleman yields back. The chair now recognizes the gentleman from Texas, Mr. Veasey, for five minutes.

*Mr. Veasey. Thank you, Chairman Rush. I appreciate you holding this hearing. And I want to thank the witness for her answers. We know we need to make an investment in this infrastructure, not only to meet our energy needs but to meet our climate goals and make sure that we are creating good-paying jobs along the way because people need to eat. People need to take care of their families. In Texas, we have set the standard for smart transmission planning to facilitate the deployment of clean energy.

In 2005, I was on the state legislature, and we passed

SB20, which established the Competitive Renewable Energy Zones or the CREZ. CREZ helped to create the High Plains with plentiful wind resources to the population centers of Dallas-Fort Worth, Houston, San Antonio and Austin. And according to Americans for a clean energy grid, CREZ enabled an additional 18 gigawatts of wind energy generation capacity to Texas's power system while overcoming technical issues such as curtailment and transmission congestion.

I am glad that the CLEAN Future Act contains provisions designed to take these successes and apply them elsewhere. Can you talk about why it's important -- why it's so important, regulators and transmission companies work together to identify and designate transmission corridors?

*Ms. Hoffman. Yes. It is very important for that collaboration and designating corridors to really think about where transmission is best placed in accessing the clean energy resources in the United States. So as we look at transmission corridors, we really want to look at a partnership with the states. I think the approach that Texas took with the CREZ program is a -- is a very important example of how we can merge infrastructure investment with policy objectives by the states to really collaborate in developing cost-effective solutions for building transmission, as well as your colleague in New York has done some similar processes in New York with respect to how do we

collaborate in looking at energy corridors but looking at the siting and placement of transmission in the United States.

*Mr. Veasey. Yeah, yeah. No, and that's important too as we -- you know, particularly when you look at Texas, I think there were about 23 percent renewable energy on our grid. Obviously, the legislature failed to take any substantive action to fix some of the issues that we had with the grid that caused -- that caused the power outage and the black -- and the blackouts that we had during the winter storm. But, you know, being able to implement things like that will make it more -- we can continue to grow that number, too, as well. So I appreciate your answers, and I yield back.

*Mr. Rush. The chair thanks the gentleman for his kindness. The chair now recognizes the gentleman from Indiana, Mr. Bucshon, for five minutes.

*Voice. Mr. Chairman, I think it should be Mr. Palmer at the moment from Alabama.

*Mr. Rush. All right. The chair now recognizes the gentleman from Alabama, Mr. Palmer, for five minutes.

*Mr. Palmer. Thank you, Mr. Chairman.

Ms. Hoffman --

*Mr. Rush. What happened -- Bucshon?

*Mr. Palmer. The national renewable energy laboratory estimated that if the U.S. were to attempt to derive 90

percent of its electricity from renewable sources, it would have to roughly double its high-voltage transmission capacity. That's what this hearing is about, isn't it?

*Ms. Hoffman. Yes.

*Mr. Palmer. We currently have 240,000 miles of high-voltage transmission lines. A doubling of that would mean that -- that we would -- would require adding enough high voltage transmission to circle the Earth about 10 times. That -- that's a lot of wire; right?

*Ms. Hoffman. Your numbers are a lot of wire. But I think, Congressman, part of it, it would be increasing the voltage on the transmission system to adding capacity to the transmission system.

*Mr. Palmer. But the point is, is that we are going to have to build new transmission lines and -- and what I want to ask you about is, first of all, we -- I think my Democrat colleagues and I have some agreement on this, that we are going to need to expedite permitting. We are going to have to evaluate some of the regulatory impediments to getting this done. This would necessarily require that we do things that we ordinarily wouldn't do, for instance, building infrastructure for high-voltage transmission across sensitive areas that are habitat-sensitive, that are wetlands, things like that. And we would have to do it in an expedited fashion if we to -- to achieve the goals, for instance, that

John Kerry and -- and Alexandria Ocasio Cortez have said that we have got -- what now? Nine years left. Under current permitting and regulatory regime, we couldn't even get the paperwork done in that time. So it would necessitate a much-expedited permitting process. Would it not?

*Ms. Hoffman. So, Congressman, thank you for the question. What I really believe is really it takes -- is a more coordinated process among the federal agency and the state agencies with respect to transmission planning and state actions from a siting point of view.

*Mr. Palmer. Well, thank you for making that point that it will take a collaborative effort between the federal government and the states because I -- I have been looking at some of the recommendations from DOE and others that have a vested interest in -- in a renewable power grid, that they basically are willing to usurp the rights of the states in regard to the states' ability and their -- to control what gets built in their states. And I appreciate Mr. Griffin bringing this up, quoting Chairman Pallone. And they are -- and his strong stand, defending the right of New Jersey to protect that.

What I am concerned about at this point, and I -- I want to ask you about this, is wouldn't it require a very aggressive use of eminent domain to make this possible? And what I want to point out to you is that there -- the effort

to build these transmission lines for renewable power generation and transmission, in 2017, Iowa enacted a law prohibiting the use of eminent domain for high-voltage transmission lines. In 2018, the Clean Line Energy Partners announced it was suspending its years' long effort to build a 720-mile 2.5 billion transmission line across the state of Arkansas.

And every member of the congressional delegation from Arkansas opposed that deal. In 2018, the New Hampshire regulators rejected a high-voltage electricity transmission project called the Northern Pass Transmission that was to carry power from Quebec, hydroelectric facilities to consumers in Massachusetts. There was a 2.3 billion, 780-mile Grain Belt Express, has been delayed for years because of opposition from Missouri farmers.

In 2019, environmental groups and local governments sued the Wisconsin Public Utility Commission to block construction of a $492 million 100-mile high-voltage transmission project called Cardinal-Hickory Creek that was designed to move wind energy to urban areas. And we could go on.

The only way that the federal government, the Biden Administration and my Democrat colleagues will be able to achieve this dream of a Green New Deal is to be very aggressive in the use of eminent domain that will deny the states the right to determine what's built in their states

and take property from private landowners. I thank the chairman. I yield back.

*Mr. Rush. The gentleman yields back. The chair now recognizes the gentlelady from Washington State, Ms. Schrier, for five minutes.

*Ms. Schrier. Thank you, Mr. Chairman. First, Ms. Hoffman, after Mr. Johnson's question about return on investment, I'd just like to give you an opportunity to explain why investment in clean energy can't be judged simply by an energy bill and has to be taken in the context of the cost of climate disasters and also that cost can decrease markedly when you have good transmission systems. So I just wanted to -- feel free, please, to -- to finish your thoughts on why energy bills are nuanced issues and can't be answered with a simple yes or no.

*Ms. Hoffman. Thank you, Congresswoman, for that opportunity to provide more details. As we look at all the cost and benefits and the benefits to consumers and nations, we really want to think of the health of consumers in the United States to be able to have that clean environment and access to healthy communities as well as economic development from manufacturing and jobs that can be created as we have low-cost electricity, affordable electricity in communities and states. And so I really wanted to emphasize that it's just not simple, the price you pay for electricity.

But there is a larger set of benefits for consideration as we build this infrastructure from a security and resilience side of things. And looking at the resilience of our nation. There is additional benefits there from building infrastructure so thank you.

*Ms. Schrier. Thank you. I wanted to give you that opportunity. Now, as you know, the Pacific Northwest is currently experiencing abnormally high record unprecedented temperatures. On Monday, Seattle broke a record for the highest temperature ever recorded at 107 degrees. In my neighborhood, it was 109. In Wenatchee, 111. And over the weekend, an investor-owned utility in my district had about seven times the volume of outages as they normally would have in June with temperatures being 30 or 40 degrees higher than normal. And the primary causes were things like vegetation, tree limbs, but also heat-related equipment failure. And traditionally, Washington sends power to California in the summer so they can run their air conditioning, and they send us power in the winter for heat. But now we are seeing this new need to maybe serve peak demand during the summertime because of these extreme temperatures that may become a new normal.

So I was wondering. Your testimony identifies numerous ways in which the Department of Energy oversees the deployment of transmission, including through the Federal

Power Marketing Administrations. Can you talk about the administration's recent and current efforts to use the Western Power Administration to build additional transmission to support the Pacific Northwest?

*Ms. Hoffman. Yes. Thank you, Congresswoman, for that question. And the Western Power Administration has a transmission infrastructure investment program, which is a congressionally authorized program that allows borrowing authority for building transmission infrastructure in the Western region of the United States.

It's about a $3.25 billion program for infrastructure investments. They can look at transmission infrastructure as well as other -- other infrastructure such as energy storage. They have built and participated in two projects under this program. And the secretary announced that this program is open for business in addition to the Loan Programs Office, borrowing authority for building infrastructure.

*Ms. Schrier. Thank you, and thanks for mentioning storage because I know that our Pacific Northwest National Labs are doing remarkable research into storage. Now, I have another question, which is do you have any comments to make about mitigating new risks? For example, now we have forest fires, as mentioned, in the entire West. And so I am wondering about any research in, for example, the development of underground transmission distribution lines, whether

that's a pipe dream or something that could really happen or would be useful and what other Department of Energy plans there are to -- to mitigate the risk that wildfire and extreme weather poses to our transmission system.

*Ms. Hoffman. So thank you, Congresswoman, for the question. Undergrounding is a great opportunity for high voltage DC transmission. As Congressman Griffin brought up about the rights of way issues, undergrounding DC lines is a really good way to utilize narrow rights of way for transmission investments. So -- but it is generally applied to long-distance lines. And the high-voltage capacity lines that -- and so that is really where the opportunity is for undergrounding. And it does provide great advantages in pairing with renewable technologies that is mostly from a DC capacity point of view.

AC technologies are -- are more, I would say -- if you wanted the underground AC technologies, you really do that in city and dense areas. So there is a difference between high-voltage DC capacity that we want to build in the United States. So with respect to accessing offshore wind or remote resources, high-voltage DC is the preferred technology.

And it does enable that ability to do undergrounding. Now, that being said, I will say it's more expensive. It is more expensive to underground. And you also have to be very cognizant of the ground conditions. Rocky environments

versus farmlands are very, very different characteristics for undergrounding. And so that is why I say planning and transmission planning is we are thinking about what transmission infrastructure we want to build really has that key component to evaluating the cost that it's going to require to get that transmission.

*Ms. Schrier. Thank you. I am over time.

*Mr. Rush. The gentlelady's time has expired. The chair now recognizes the gentleman from South Carolina, Mr. Duncan, for five minutes.

*Mr. Duncan. Thank you, Mr. Chairman. Love to have you back in the committee room sometime soon. Assistant Secretary Hoffman, thank you for being here today. I understand there is a provision in the CLEAN Future Act, Section 220(c), which requires all public utilities to place transmission facilities under the control of an independent system operator or regional transmission organization within two years of the enactment of the act.

Now, I represent South Carolina, which currently does not participate in an RTO or an ISO market. Last year, the state legislature directed the state to study electricity market reforms, including the possibility of joining an RTO, ISO or other options. Generally, I do think this sort of issue should be handled at the state level through the state legislatures and utility commissions.

States know their residents. They know their energy market priorities and the stakeholders best. South Carolina has taken data-driven approach to determine what market structure is best for the state, and I do not believe that it should be short-circuited by bureaucrats here in Washington, which is exactly what the CLEAN Future Act will do. So why not let South Carolina decide for themselves whether it's in their best interest for its energy consumers to join an RTO or ISO?

*Ms. Hoffman. So thank -- thank you, Congressman, for the question. RTO decisions is -- are -- are under the jurisdiction of FERC and not the Department of Energy. The Department of Energy collaborates with the states in evaluating participation in the RTOs. I know that the southeastern states is looking at different market enhancements for the southern states as they look at Southeast. I think it's market exchange program, looking at bilateral exchanges in 15 minutes. I think it comes down to a discussion with FERC and the future of RTOs.

*Mr. Duncan. I just can't help but notice that nuclear reactors going off-line within RTOs and we have heard some of my colleagues today represent these areas. Our priority should be pursuing market structures that keep these energy sources affordable and reliable for consumers, maintaining a market conducive to keeping and bringing reactors online

important.

In fact, there's a whole list of states that have reactors that have been taken off-line. Mr. Chairman, I'd like to submit this for the record.

[The information follows:]

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

*Mr. Duncan. In my district, Duke Energy has filed an application with NRC to renew the Oconee Nuclear Station's operating licenses for an additional 20 years. It's the largest nuclear station. Three generating units produce more than 2500 megawatts of carbon-free electricity. These would get carbon-free electricity as well, but they are now not off-line. I will commend the Connecticut governor for seeing that if you want to be more carbon-neutral, you keep the reactors online.

But given what's going on in other regions, do you think the CLEAN Future Act, RTO and ISO requirement may undercut South Carolina's clean energy future with regard to nuclear reactors, any other things, both from a jobs or energy perspective?

*Ms. Hoffman. So Congressman, thank you for the question. Nuclear energy is an important part of the clean energy portfolio from a generation resource future. The administration is supportive of nuclear energy as part of the portfolio. I know the Department of Energy is working on advanced nuclear designs and nuclear technologies moving forward. And so hopefully that will continue to develop new nuclear assets in the United States but also continue to strengthen our -- our nuclear fleet.

*Mr. Duncan. Yeah. We can agree on that. In your testimony, you mention that in order to meet the goal of 100

percent clean energy by 2035, given a greater amount of electricity generation from our renewable sources will be needed. Don't mention any of the role of nuclear in those comments. So do you -- I guess you agree that nuclear energy -- because what you just said is a part of that. Do you agree it's critical for both the reliability and resiliency?

*Ms. Hoffman. Nuclear energy is a critical part of our portfolio with respect to decarbonization. And it is an asset that is -- can be utilized moving forward. I hope with new technologies, that asset can be a little bit more flexible in providing flexible generation --

*Mr. Duncan. When you mentioned new --

*Ms. Hoffman. -- for the system.

*Mr. Duncan. -- new reactor technology and whatnot, what are you talking about?

*Ms. Hoffman. So I am not the -- the expert with the nuclear program. I'd be more than welcome to get our nuclear office to come in and have a collaborative discussion.

*Mr. Duncan. I'd love for you to do that. I'd love to see what this administration. I know what I think the future should look like. I know what other experts have told me. I'd love to hear what the administration thinks about what that future looks like. With that, Mr. Chairman, I will yield back.

*Mr. Rush. The gentleman yields back. The chair would

like to say to the gentleman that this is a hybrid hearing of over nine -- 100 -- it's a hybrid hearing for a reason. We are not certain if all the Republicans have been -- the chairman also like to remind the gentleman what scripture says. You should not criticize, look at the splinter in your neighbor's eyes when you have -- might have time in your own eye. So the gentleman should be wary of trying to -- to cast dispersion on the chair. The chair now recognizes the gentlelady from Colorado, Ms. DeGette, for five minutes.

*Ms. DeGette. Thank you so much, Mr. Chairman. Welcome, Ms. Hoffman. It's always good to have your deep knowledge of the subject in front of this committee. As we are -- and -- and I have some -- some sort of deep questions here. As we move towards more renewable energy and hopefully under clean energy standard, accounting for energy lost during transmission is going to be critical in ensuring that when we say we are getting 100 percent clean energy, we are really getting 100 percent clean energy.

And if we don't account for energy loss, that may inadvertently create a loophole through which technical compliance with a hundred percent clean energy standard could still allow carbon emissions because of energy lost. And so I am wondering if you can tell me does DOE have a good idea of how much energy is lost in electrical transmission?

*Ms. Hoffman. So in general, I would say that electric

transmission, there is about a 2 percent energy loss. Distribution systems are higher. Generally, the higher the voltage, the less loss on a transmission line.

*Ms. DeGette. Okay. Does it vary between different types of transmission lines, different parts of the country, different seasons and so on?

*Ms. Hoffman. So yes, Congresswoman. Thank you for the question. It will vary depending on the type of material that's used in the transmission line, how long the transmission line is and the other factors that you have brought up. Not repeating them all. And so there is a variability in the losses from that.

*Ms. DeGette. Now, if DOE were asked to account for the energy lost along the different transmission lines given those variables, would the department be able to do so?

*Ms. Hoffman. So the department would be able to verify transmission losses in a controlled environment with our national laboratories. I would say that the utilities themselves could provide a very performance-based analysis with respect to the losses on their system. And so as we look at performance-based with utilities that they should be able to provide representation of that. In addition, I am wondering if EIA probably also has some information in this space that could be useful.

*Ms. DeGette. Thank you. Now, in your testimony, you

mentioned that your office has been making efforts to reduce energy loss transmission. Can you talk a little bit more about that work?

*Ms. Hoffman. Yes. With the Department of Energy, what we really want to be able to do is maximize the capacity and utilization of our transmission system. So a lot of the technologies that we would look at really focus on a couple different areas. First is utilizing the maximum capacity of the line, which would be dynamic line ratings for the ability to really utilize those lines. Other technologies really comes along the lines of advanced conductors to be able to increase the efficiency of a transmission line. And so that's focused on composite conductors.

There are various technologies out there such as carbon-reinforced conductors that allow for additional throughput on transmission lines as a result of that technology.

*Ms. DeGette. Okay.

*Ms. Hoffman. In addition, there is other sensors and capacity and materials for advancing transformers and efficiency of transformers. So we have a portfolio of programs, and I appreciate the opportunity to discuss those.

*Ms. DeGette. I appreciate it too. We have had a robust discussion of the siting of transmission lines today in this committee. And one of the things that I think is important which you mentioned is the siting of -- of lines

across public lands, which is an issue we have a lot of in my state of Colorado, and it's a really important issue. You said that the Federal Power Act provides DOE the authority to coordinate federal authorization decisions on transmission, including setting deadlines for decision-making. So I am wondering how that's worked.

*Ms. Hoffman. Thank you, Congresswoman, for the question, and I guess this will date me a little bit in my experience and tenure in the Department of Energy. But back in 2009, DOE has done an MOU with our interagency partners. And that is called the lead agency designation as part of 216(h) in the Federal Power Act. And what this allowed was for us to develop and designate a lead agency.

And being a designated lead agency, that agency would establish milestones for projects.

*Ms. DeGette. Right. So I only have 13 seconds left. So let me ask you. Those milestones and deadlines that have been set, have they actually been met?

*Ms. Hoffman. So I would ask you to -- it's been mixed. I would ask you to go to the Federal Infrastructure Permitting Steering Committee. There is a dashboard with several project examples that highlight which milestones have been met. So it's been a mixed success and I think a -

*Ms. DeGette. So you --

*Ms. Hoffman. -- work in progress.

*Ms. DeGette. Okay. Mixed success. Thank you. I yield back.

*Mr. Rush. The gentlelady yields back. The chair now recognizes the gentlelady from the great state of Arizona, Ms. Lesko, for five minutes.

*Mrs. Lesko. Thank you, Mr. Chairman, and thank you, Assistant Secretary Hoffman, for being here. Assistant Secretary Hoffman, do you -- what role do you think natural gas plays in the future of our electricity in our nation?

*Ms. Hoffman. So natural gas is currently playing a role of providing flexibility and balancing variable resources and looking at providing support for the system, similar to hydropower assets. It is providing that flexibility and support for the system.

*Mrs. Lesko. And I have a concern that in the CLEAN Future Act, it says that basically we need to eliminate natural gas by 2035 for electricity generation. My concern is that that's going to -- is a fast time period. Many think that it's -- it's not achievable in that short of a time period. Do you think -- my concern is that that will increase prices to my constituents, utility costs, and also decrease reliability of the grid. Do you share my concern?

*Ms. Hoffman. So with respect to natural gas, the opportunity exists for decarbonization with CCUS, carbon

storage and capture. And as the department looks at alternative clean fuels, that is going to be the transition to a cleaner fuel infrastructure. And so I think the balance is going to be during that transition, the science and technology development that's going to have to occur for us to achieve those goals. I am not a natural gas expert, so I would be more than welcome to have the staff and the department collaborate with you on some of these discussions moving forward.

*Mrs. Lesko. Thank you. You had brought up earlier in your testimony about Biden's 30 by 30 plan. I think you said that it would require 30 gigawatts of offshore wind by 2030; is that correct? And I -- I looked up, and it said the average wind turbine has a capacity of 2.55 megawatts. And so if I did my math right, that means it would require 11,765 offshore wind turbines to generate this amount of electricity.

In a previous ENC committee hearing, we heard from former Secretary of Energy Moniz. And if my memory serves me correctly, he said that each offshore wind turbine takes 1 ton of critical materials, minerals, to build. And that, you know, would be -- require tons of excavating, processing, that type of thing.

Considering that America now relies on foreign countries, sometimes adversary foreign countries like China,

for our critical minerals, I think a hundred percent of 17 critical minerals, where do you propose that we get all of these critical minerals to build 11,765 offshore wind turbines?

*Ms. Hoffman. So I understand that the Department of Energy and the Office of Energy Efficiency, renewable energy, there is an emphasis in looking at advanced materials and critical materials as well as alternatives for replacing critical materials or looking for material alternatives. So I think it's important as we move forward to address these challenges, recognizing they are challenges and -- but still continue to move forward on what technology can do and what we can do in this space. So I recognize and I thank you for the question. These are very important issues that must be part of the dialogue and the conversation.

*Mrs. Lesko. And thank you. And the reason that I bring these up is I think there's -- I have a general concern, and many of us do, that the timeline for switching to purely solar and wind is just totally unreasonable and will increase the cost to my constituents' utility -- I have a lot of senior citizens on fixed incomes in my congressional district, and they complain if their utility bill goes up by five dollars, let alone, you know, this 14 years. We are going to get rid of a reliable baseload energy and somehow think that we are going to replace it so soon in such a fast

timeline.

And the technology isn't there right now to do that. In fact, last night, I talked to another former Secretary of Energy, and he thinks it's going to take 20, 25 years to have the right energy storage batteries that are needed to do this. And so that's -- that's my concern. I am concerned about my constituents, the cost of electricity, and the reliability of the energy grid. I sure as heck do not want Arizona --

*Mr. Rush. The gentlelady's time has --

*Mrs. Lesko. -- to have rolling blackouts --

*Mr. Rush. The gentlelady's --

*Mrs. Lesko. -- like here --

*Mr. Rush. -- time --

*Mrs. Lesko. -- California does.

*Mr. Rush. -- has expired.

*Mrs. Lesko. Thank you. And I yield back.

*Mr. Rush. The gentlelady yields back. The chair now recognizes esteemed jurist from the great state of North Carolina, Mr. Butterfield, for five minutes.

*Mr. Butterfield. Thank you very much, Mr. Chairman, and let me say good afternoon to you and to all of our colleagues. And thank you, Mr. Chairman, for your leadership. Thank you for convening this very important hearing today.

And on the subject of hybrid hearings, let me just say for the record that I share my colleague's desire for us to come back together and reunite in the committee room. But my friends, we are not there yet. And I -- I share the chairman's view that when we are convinced that all members, not just -- not just Republicans but when all members and staff have been vaccinated, then we can return to in-person hearings, and I look forward for that to happen. I have great respect for the wellness of my colleagues. And I only ask that this attitude would be reciprocal.

And thank you, Ms. Hoffman, for your testimony. Thank you for your many years of service. I am from the great state of North Carolina. We have affordable retail electric rates in our state below the national average, which is very beneficial for low-income and rural residents who reside in my district. And so we must ensure that electricity consumers like those not only in my district but -- but many of your districts will continue to have access to affordable rates when upgrades are made to our transmission infrastructure. That's a great fear that I have. Although larger transmission projects are sometimes necessary, could we ensure -- and this is my question -- how could we ensure that transmission providers also invest in the types of less expensive non-wire alternatives that can keep rates low?

*Ms. Hoffman. So thank you, Congressman, for the

question. And it's very important as we think about transmission planning that we also consider non-transmission alternatives, energy storage, distributed energy resources, energy efficiency are all non-transmission alternatives that can provide a contribution as we move forward in meeting the President's clean energy goals.

And so these are important aspects that every state must consider. Transmission planners will consider moving forward of the consumer engagement in this part of the conversation and say, "Look at their demand management,'' and say, "Look at their consumption.'' And so I think these are critical dialogues that the states and the utility industry can -- moving forward, it's important to discuss non transmission alternatives.

*Mr. Butterfield. Thank you for that. Electric utilities in my district -- and many of them are owned by municipalities, and some are owned by electric co-ops. But they are all dependent on the lines that other transmission providers operate to deliver electricity to their consumers. And so my question to you now is whether through the bills we are discussing today or -- or other things that we can do, how can we ensure that the services of existing electric utilities like those in my district remain robust when significant investments are made into our transmission infrastructure.

*Ms. Hoffman. So Congressman, thank you for the question. You bring up a very important issue that we need to invest not only in the transmission system but have strong distribution utilities, whether it be investor, municipal or cooperative utilities because a lot of that interface is really at the distribution level to the consumers. And so reliability is more significant at the distribution system where a lot of the outages occur, is on the transmission or is on the distribution system.

So technology investments, investment in the distribution system, is really important as we move forward. A lot of things the department has been looking at are things such as microgrids for -- or for building resilience, looking at sensing and tools for asset management in strengthening the distribution utilities. So all these are very important, and we have to take a holistic picture of an electricity delivery system that includes both the transmission and the distribution system.

*Mr. Butterfield. Thank you very much, Ms. Hoffman. Mr. Chairman, I have 45 seconds remaining. I will compensate for Ms. Lesko's overrun, and we will cancel out each other and I will yield back. Yes. I am yielding back.

*Mr. Rush. The gentleman yields back. The chair appreciates the gentleman's generosity. And now the chair recognizes the gentleman from the great state of Indiana, Mr.

Bucshon, for five minutes.

*Mr. Bucshon. Thank you, Mr. Chairman. There is no doubt that updating and modernizing our transmission infrastructure is vital to ensuring energy reliability. In fact, ensuring energy reliability should be the primary focus as we move to address these problems legislatively. Unfortunately, that's not the case. This is now the 7th legislative hearing the committee has held to review the CLEAN Future Act, and I wonder what progress has been made.

We have seen no changes to the bill text or even any consideration that my colleagues on the other side of the aisle are open to making changes. Now, I understand that this bill, which is 981 pages and valued at over 500 billion in spending may require additional time to review because of its length.

But again, I question how this action is helping the hardworking Americans that sent us here to represent them. So I urge this committee to get back to -- to working together. With respect to the legislation before us, I have heard specific concerns about overriding state and local energy policies, creating new problems by expanding FERC's transmission jurisdiction, passing the increase in energy prices off to the customers, failing to -- and failing to address the permitting process and timelines and not to mention any others.

So who is it that usually stops infrastructure projects anyway when we try to do them even when funded? Well, honestly, it is mostly the Democrats and their supporters, trial lawyers, environmental activists. But my Democrat colleagues plan to now support the use of eminent domain, for example, to build EV charging stations and powerlines that supply them, ignore environmental standards if the line has to go across a river or a stream.

My colleagues plan to force federal agencies like FERC and other really Democrat-dominated federal agencies at the career level to look the other way because if you don't, the proposals in the CLEAN Futures Acts can -- Act can't happen no matter how much money you throw at it. It's just not a practical timeline for the things that are being proposed. So Ms. Hoffman, infrastructure buildout takes years to accomplish, and that is assuming there are no delays in the process, which, for the reasons I just stated, trial lawyers, environmental activists, there will be decades of delays. We have seen this. I am not making this up. This happened in Indiana with Interstate 69 that we built from Evansville to Indianapolis. They started talking about it in 1969. And it is still not completed, and it will be completed maybe in a couple of years. What stopped it? Eminent domain, trial lawyers, environmental activists, and others.

If these projects were cost-effective or economic, maybe

it would be a different story, but they are not. But how do you expect a government works project that will be sure to displace real private investment keep that kind of schedule? I mean, how can you keep the kind of schedule you are proposing?

*Ms. Hoffman. So thank you, Congressman, for the question. The department stands ready to try and utilize every authority it has available --

*Mr. Bucshon. So you are going to support use of eminent domain to take over private land to develop your projects?

*Ms. Hoffman. So the -- the Department of Energy is going to look at its authorities with respect to can it with technical assistance to the states with collaboration and transmission planning to best figure out where transmission can be developed.

*Mr. Bucshon. So most transmission lines now aren't in the air. As you probably know, they are in the ground; right?

*Ms. Hoffman. Yes. High-voltage --

*Mr. Bucshon. That's just the way it is --

*Ms. Hoffman. High-voltage --

*Mr. Bucshon. -- for a variety of reasons. So you are going to -- will you guys support the fact that when you try to get transmission lines across the Ohio River in southern

Indiana and Kentucky, will you support burying those underneath the Ohio River and coming across to do that? The power lines that are going to take to supply charging stations are not, you know, the electric cord you buy down at Home Depot; right? They are not 110 power outlets. These -- unless you want to spend 40 hours charging your car.

*Ms. Hoffman. So the high-voltage DC transmission lines are mostly underground. And they are part of the infrastructure.

*Mr. Bucshon. And so are oil pipelines that have been shown to be the safest way to transmit oil; right? But that doesn't stop you all and the environmentalists from stopping those from happening, well, at least in the United States. I mean, you can build a pipeline from Russia to Germany, but you can't build one from Canada to the U.S. So this will be the same thing. So what you are saying is you don't think that there will be -- you don't think that your timeline is a problem?

*Ms. Hoffman. Congressman, I think it's important for us to push our timeline to push the capacity and the capability with respect to the resources that the Department of Energy has to offer with assistance, coordination with the federal agencies. And so it is really trying to make a best effort to meet the timeline with the authorities but also the partnerships and collaborations that are necessary to get

this done.

*Mr. Bucshon. Fair enough. I yield back.

*Mr. Rush. The gentleman yields back. The chair now recognizes the widow of our late and great colleague, Congressman Bob Matsui, Ms. Matsui, Ms. Doris Matsui, who is great in her own right. She is now recognized for five minutes.

*Ms. Matsui. Thank you very much, Mr. Chairman. And I appreciate the hearing very much, and I appreciate also Assistant Secretary Hoffman for being here today as one of our witnesses. You know, throughout my time in Congress, I have spearheaded initiatives such as the Clean and Efficient Cars Act and enacted legislation to reauthorize the Diesel Emissions Reduction Act.

Now, these efforts will help expedite the transition to light, medium, and heavy-duty electric vehicles and lower emission carbon emissions and air pollution from the transportation sector. Ms. Hoffman, how will transportation rectification affect the transmission system, and what actions should Congress take to ensure that a transmission system will meet the demands of this transition?

*Ms. Hoffman. Thank you, Congresswoman, for your question. I think it's an exciting development and opportunity in the vehicle industry with electrification of vehicles, heavy-duty vehicles, the announcement of the Ford

F-150 is an exciting opportunity as well as fixed-use vehicles in the continued electrification of those vehicles. With this, electrification requires or is going to end up resulting in an increase in demand for electricity and therefore really investments in our transmission but our distribution system as we look at charging stations and how we are going to build that infrastructure out.

So recognizing this increase in demand, we are going to have to modernize our distribution system, look at technologies such as smart charging environments so that we can actually manage the different charging cycles with respect to electric vehicle and charging capacity.

*Ms. Matsui. Okay. Well, thank you. In my home district, the Sacramento Municipal Utility District, also known as SMUD, has committed to decarbonization by becoming the first utility company in the nation to lay out a plan to completely eliminate carbon emissions from his power supply by 2030. To support the achievement of this ambitious goal, we must bridge the gap between clean energy generation from remote locations to urban areas such as Sacramento. Ms. Hoffman, what are the most important investments that Congress can make on our transmission system to support decarbonization of our power sector?

*Ms. Hoffman. So thank you, and I recognize SMUD's achievement with respect to their goals and being a very

forward-leaning utility and looking at decarbonization. With respect to investments on the transmission system and the priorities, really goes after increasing the capacity of the existing system with great enhancing technologies such as dynamic line rating, energy storage technologies, re conductoring of our transmission system. And then it really goes after what is the investments needed to build new transmission in the United States, including high voltage DC transmission in a transmission planning process that allows for collaborative dialogue and interactions with the states on transmission planning.

*Ms. Matsui. All right. Thank you. You know, one of our goals is we build back better to focus on environmental justice and energy equity. Initiatives like the TREES Act, my bill to reduce energy bills through residential tree planting can be used to lower home electricity costs while combating heat islands. Ms. Hoffman, in your testimony, you mentioned that an enhanced grid supports environmental justice and economic development and allows underrepresented and underserved communities to access clean energy. Can you explain how today's bills would support environmental justice and energy equity and how a robust transmission buildout will help achieve these goals.

*Ms. Hoffman. Thank you, Congresswoman, for the question. Environmental justice is an important -- and

energy justice is an important objective of the secretary. Justice40 is an effort looking at 40 percent of the benefits going to economic disadvantaged communities. As we look at transmission investments, one of the things that I can directly highlight is looking at the loan program office that does -- has the ability to provide loans to tribal nations for transmission development and infrastructure investments. And so that is an opportunity to really directly take advantage of it.

But in addition, we look at transmission as being an economic enabler to allowing, as you have, access to reliable electricity. It is an incentive for economic development and manufacturing in the United States. And so a lot of that really provides opportunities in communities.

*Ms. Matsui. Now, thank you very much, and I truly believe this is an important time to really consider all communities as we move forward and look at what we are going to be doing in the future. Thank you very much for your testimony, and I yield back.

*Mr. Rush. The gentlelady yields --

*Ms. Hoffman. Thank you.

*Mr. Rush. -- back. The chair now recognizes the gentleman from the great state of Indiana, Mr. Pence, for five minutes.

*Mr. Pence. Thank you, Chairman Rush, Ranking Member

Upton, for holding his hearing, and thank you, Assistant Secretary Hoffman, for being with us today. You know, as the head of the Office of Electricity, you play a key role in advancing grid modernization efforts that could benefit the Hoosiers in my Indiana 6th District where we have coal, natural gas, wind, and solar.

Modernizing our transmission system for the 21st century isn't a partisan issue. I am all of the above type of individual. However, the self-imposed timeliness, as you have heard today, of the CLEAN Future Act and the administration commitments, in my opinion, are unworkable, unrealistic, and may be incredibly costly. Earlier this year, I had the opportunity to sit down with Ms. Miso, I think which you mentioned earlier, in Carmel, Indiana. In their estimation, by 2030, ensuring reliability and affordability, generation mix in the region could be 32 percent renewable energy and 55 percent fossil fuels. In other words, the lead entity ensuring reliability in my grid does not find it feasible to meet the administration's goal of carbon-free power by 2035 and the stringent timeline of the Democrats' clean energy standards. Our grid has taken over a century and a half to build, but some of my colleagues are talking about replicating this network in a mere 15 years. We should be supporting private industry stakeholders across the country that are already investing to bring our

shared goal into reality.

In fact, just in Indiana, utilities across my state have invested over 2 billion annually to upgrade transmission and smart grid capabilities. There needs to be a landing strip for this committee to work together on modernizing our grid. This can be done by leveraging private investment into transmission technologies and maintaining local authority, which I, like my fellow Hoosier, Congressman Bucshon, has pointed out, that's a big deal in putting windmills and solar panels. It is just people have fought back at that tooth and nail.

Pressuring utilities to meet unrealistic timeliness will only sacrifice reliability and will most likely lead to steep increases in electricity prices for my ratepayers and probably higher taxes. I wish my colleagues would support efforts to streamline permitting and construction costs to leverage private investment without superseding local authority.

The ambitious timeliness to integrate renewable energy into our grid, rely too heavily on technology that, in my opinion, is not ready to provide sufficient service at a cost that is reasonable. You know, earlier you talked about technologies that would deliver to retail. I know that some of the things that are happening in Europe delivering charging stations, the locations have to spend, in some

cases, millions of dollars to be able to put in the grid stations. I suggest that you take a look at that, and I'd be happy to help with that information.

As one example, you already know modernized grids will need to provide dispatchable, flexible energy supply to make up for the variability of wind and solar. However, current battery storage technologies are not yet ready to provide more than a short-term backstop. Here is my question, Assistant Secretary Hoffman. Can you talk about some of the successful grid modernization R&D initiatives that the tools you mentioned earlier have helped the private sector to develop economic alternatives to achieve this administration's timeline?

*Ms. Hoffman. So thank you, Congressman, for the question. Through the grid modernization initiative, we have really been working on developing advanced technologies and capabilities in support of the utility sector. And some of the things that we have looked at is sensors for asset management to improve the utilization of the electric grid. And so some of the --

*Mr. Pence. If I may, just specifically, I am running out of time. So have -- has private industry implemented some of those things you have developed or recommend?

*Ms. Hoffman. Congressman, yes.

*Mr. Pence. Okay. Thank you, and Mr. Chair, I yield

back. Thank you.

*Mr. Rush. The gentleman yields back. The chair now recognizes the gentlelady from Florida, Ms. Castor, for five minutes.

*Ms. Castor. Thank you, Mr. Chairman. I appreciate that we focused a lot about the cost on consumers and affordability during this hearing. The truth is the status quo is really hurting consumers. A January 2021 report from the Americans for a Clean Energy Grid found that the backlog in the interconnection queue is needlessly increasing electricity costs for consumers by delaying the construction of new projects, which are cheaper than the existing electricity production. It also found that the risk from the uncertainty of the interconnection process significantly increases the cost of capital for generation developers, private -- a lot of folks in the private sector, which increases the cost of energy for customers. So to address this traffic jam that we have, last week I introduced the Efficient Grid Interconnection Act to help families power their homes with affordable and abundant clean energy, reduce the costly transmission, congestion and help connect more low-cost renewable energy to the electric grid.

Assistant Secretary Hoffman, thank you so much for being here today. There was another study last month out of the Lawrence Berkeley National Laboratory that found that about

680 gigawatts of zero-carbon energy was stuck in these interconnection queues nationwide. That's nearly five times the nation's existing -- existing wind and solar capacity. The average wait time is about three-and-a-half years.

So that's just completely frustrating, what businesses, what states, communities are trying to do, what the federal government is trying to do to increase clean energy. So tell us how -- and thank you because DOE provided some input on the -- on my bill. Just explain in real-world terms how everyday Americans would benefit by clearing out these interconnection queues.

*Ms. Hoffman. Thank you, Congresswoman Castor, for your question, your comments, and your bill. The cost allocation and interconnection queues is a huge issue. I would say on a good -- on the positive side, it shows the excitement for the development of clean energy generation in the United States. It also identifies the challenges, the 3.5 years for getting a technology connected to the grid. And that is the purpose of an interconnection queue is to do a study on what system upgrades are required to allow that technology to connect to the grid. And so it's very important that we take a holistic approach as we think about the renewable energies, energy storage and technologies we want to connect to the grid, what the system upgrades are that are required and how to allocate cost for upgrading that system.

And that is really the debate of the discussion around interconnection queues is how to best do that on an individual project basis or what some interconnections are doing as cluster studies. And so -- but this is a really important issue. It's under the jurisdiction of FERC. But the Department of Energy will continue to provide some technical assistance, as we have done through Lawrence Berkeley Laboratory to identify and help really analyze some of these issues.

*Ms. Castor. And this would be a huge job creator. Don't you agree?

*Ms. Hoffman. Yes, of course. Having the additional generation come onboard, there is different studies identifying the potential opportunities for job creation not only in the transmission side but on the generation side, good quality jobs, a variety of jobs from the engineering field to construction jobs to the service industry. So it is a very important topic.

*Ms. Castor. I think we'll hear about that in the second panel as well. There -- on the transmission siting assistance, the help for states and local communities to do a lot of the planning that can save money and lawsuits down the road, your office is going to be tasked with providing that technical assistance. And you already explained to Chairman Pallone how it would help. But I want to ask you a slightly

different question. If we were to increase development of these interstate high-voltage transmission lines, what impact do you think it will have on jobs in rural communities, middle America?

*Ms. Hoffman. So thank you, Congresswoman, for the question. Once again, the transmission really provides access to clean energy resources, remote locations and really will bring it to all communities in the United States. Allowing for that access of clean energy allows for economic development. It allows for job creation. And so that really becomes the stimulus for a strong economy moving forward.

And so rural communities will be able to take advantage of it as well as the administration's effort with energy justice and really concentrating on disadvantaged communities and allowing for those benefits to be clearly directed and allocated to communities is an important role.

*Ms. Castor. Thank you very much. I yield back my time.

*Mr. Rush. The gentlelady yields back. The chair now recognizes the gentleman from North Dakota, Mr. Armstrong, for five minutes.

*Mr. Armstrong. Thank you, Mr. Chairman, and thanks for being here. So one of the things that's not in the CLEAN Futures Act is litigation reform. And I -- actually, the federal backstop authority, when we are talking about

disagreement among states, is important. But, I mean, let's be -- people hate utilitarian infrastructure projects regardless of what they are. And I have been warning about this for even my -- longer than my time in Congress. The opponents of these projects are going to utilize a lot of what they have learned in pipeline litigation.

I mean, these tactics have been being used against those types of projects for the last 20 years, and you are seeing it right now. You have the Missouri Grain Belt Express, which is essentially taking wind from Kansas and trying to transfer to the East Coast. And common carrier, public utility, eminent domain, all of those issues are being brought up. There was an offshore wind project in Martha's Vineyard that was opposed by commercial fishermen. It was opposed by a lot of other people, but that was the avenue in which they went with. And I think that's important; right? If you don't like the project, you don't necessarily oppose it in your backyard. You go to bottlenecks. You go to different places. I'll bring that up in a second. I mean, there was a Maine project that was only in Maine because New Hampshire had already denied it, which was bringing hydropower from Canada to New England. I mean, this isn't oil. This isn't coal. This isn't natural gas. This isn't nuclear. It is hydropower.

And that was opposed, I mean, by the Sierra Club,

landowners, and the oil and gas industry. Our -- the carbon industry. So as we talk about these things and we move forward and we are -- and, I mean, when we talk about collaboration between DOE and the states, I think before we get there, we have to talk about particularly where some of these bottlenecks occur. And I am just going to use Highway 85 in North Dakota as an example. It's a -- it's an interstate highway. It connects the southern part of North Dakota to the northern part.

We have a tremendous amount of oil and gas production up there, but we also have a lot of renewables out there. So just by going across that, because it's a natural bottleneck, you hit the National Park Service, the Fort Berthold Reservation, Lake Sakakawea, both the Missouri River and the Little Missouri Scenic River. So in order to deal with anything up there, you have to deal with the BIA, the EPA, FERC, DOT, Corps of Engineers, Interior, BLM, the Forest Service, the National Park Service, county zoning, county commission, North Dakota Petroleum Council, Department of Environmental Quality, and the Industrial Commission. And so when we talk about collaborating and doing all of these things, I think it's important to remember that most of the litigation around these things is actually -- and court decisions aren't actually -- it's on court interpretations or agency interpretation of a law or regulation and not the

underlying law itself.

Just my question for you from Department of Energy, who is in charge of, you know, safety, security, reliability of the grid, maybe before we go to collaborating with the states, we need to figure out how to shrink down the voluminous amount of paper we have to deal with in these bottlenecks because every single one of those pieces of paper is a potential litigation; right?

A plaintiff's lawyer doesn't care if you complied with BLM if what you put in the Park Service permit was different. All they care about is the difference. And they don't have to win any of these. And before we talk about, you know, replacing existing transmission with more efficient transmission, I would just point to the Enbridge Pipeline in Minnesota; right? They are not putting a new pipeline in. They are taking an old pipeline and replacing it in the same spot with a new pipeline. So these are all things that, again, I think -- I think it's been borne out; right? If -- if you care about a monarch butterfly or a prairie chicken or a sage grouse or any of those different things, we didn't even talk about the Environment Endangered Species Act. You don't particularly care what's bifurcating the habitat. You just care that the habitat is being bifurcated.

So are you guys working with other federal agencies to figure out -- I -- I just personally -- I am an old trial

lawyer. So I think the less amount of paper, the less litigation you have. So when we are dealing with these issues, how are we going to coordinate amongst federal agencies, so people only have to -- only have to reply once to one thing? Because under current law, you have to reply to every single one of them.

*Ms. Hoffman. So Congressman, thank you for the comments, and you bring up the crux of the issue and the heart of the issue with respect to litigation of projects. And projects are litigated. And the need here is really having folks as collaborating agencies. So we do the process once and not more of a linear process that ends up going back and forth and creates more paperwork and more volumes of materials. And so I think we have to think about this. I think we have to really think about how agencies can be collaborating agencies, so we do the process once. But you really highlight the crux of a huge challenge in building infrastructure in the United States.

*Mr. Armstrong. And I just want to be clear before I end with four seconds. We need to do it with the states too, but I think the federal government needs to get its house in order first. Thanks.

*Ms. Hoffman. Yes, sir.

*Mr. Rush. Does the gentleman yield back? The gentleman yields back?

*Mr. Armstrong. I yield back.

*Mr. Rush. The chair now recognizes the gentleman from Vermont, Mr. Welch, for five minutes.

*Mr. Welch. Thank you very much. Ms. Hoffman, thank you for your very helpful testimony. Can you outline some of the really practical impediments about building out the grid so that we actually can transport renewable energy to where it is needed? Also, are there some things that can be done on the permit process that will expedite it obviously without compromising local concerns and environmental concerns?

*Ms. Hoffman. So thank you, Congressman, for the question. And the impediments for building transmission really come in several categories. One is financing of transmission. The second is permitting of -- permitting and siting of transmission and making sure that the costs are allocated appropriate for transmission as well as being able to come up with a national transmission plan and looking at planning of transmission moving forward. So I would say that those were the major challenges that we all face in looking at how we build this important infrastructure moving forward. With respect --

*Mr. Welch. Well, I want -- I want to say --

*Ms. Hoffman. -- to your second --

*Mr. Welch. I want to stay -- go ahead. I wanted to stay on that a bit because we are all interested in getting

the transmission seat -- system we need for reliability and also to get the power from where it's generated to where it's needed. But is there progress that's being made on the very real-world challenges about how you permit that, and will the transmission, is it anticipated, that will mainly be in high-transmission wires?

*Ms. Hoffman. So thank you for the question. I do believe there is progress being made as we look at technology solutions with respect to increasing the efficiency of the transmission system as well as a recognition by the states, the need for transmission to really enable clean energy deployment. Nineteen states have targets for net zero as well as other states have enabled utilities or really directed utilities to invest in clean energy. So I think the movement and the recognition is there. Now, the procedural ways of how do we become collaborating entities as we look at transmission siting, and that is real -- or permitting, that is really where we are going to have to go after moving forward to continue to make progress.

*Mr. Welch. Okay. What are the benefits of the President's proposed grid deployment authority?

*Ms. Hoffman. So thank you. The grid deployment authority provides an opportunity for us to really bring together the authorities in the department as well as the technical assistance that the department would provide under

one umbrella or under a central location so that we can be very effective as we look at transmission development. You can take a look at the example of, say, offshore wind and where we really want to do that technical assistance, the consultation with the states as well as a -- a transmission planning strategy moving forward.

*Mr. Welch. Representative Clark and I are going to be introducing the Federal Energy Efficiency Standard. What role do you see that as potentially playing in achieving the goal of massive reduction of carbon emissions?

*Ms. Hoffman. Thank you, Congressman. Non transmission alternatives such as energy efficiency, demand response, energy storage all play an important role with respect to consumer engagement and onsite resources in supporting the administration's goals. So those are opportunities really to really get ahead of the game by instilling in really deploying energy efficiency measures.

*Mr. Welch. Okay. Thank you very much. Mr. Chairman, I yield back. Thank you for the excellent hearing.

*Mr. Rush. The gentleman yields back. The chair now recognizes the gentlelady from New Hampshire, Ms. Kuster, for five minutes. The chair now recognizes the gentlelady from New Hampshire, Ms. Kuster, for five minutes.

*Ms. Kuster. Thank you so much, Mr. Chairman. I am very grateful for you taking the time and for the opportunity

to hear again from Acting Assistant Secretary Hoffman. As you referenced in your testimony, the evolution to a clean grid poses significant challenges for how our nation moves electricity. Our most promising sources of wind energy are in the interior and offshore, far away from the major urban areas where electricity is most needed.

So we must reevaluate how the grid operates and where it is built to take advantage of these resources. This is no small task and an issue that the subcommittee should examine in a bipartisan way. New England is blessed with vast offshore wind resources which, if properly utilized, have the potential to meet the region's energy needs. ISO New England, the entity responsible for managing our power markets in the Northeast recently conducted a study of the region's ability to incorporate offshore wind into the grid. It found that the southern part of our grid could take roughly 6 gigawatts of new offshore wind before serious upgrades to the region's transmission infrastructure are necessary.

So Acting Assistant Secretary Hoffman, how could President Biden's American Jobs Plan help New England meet its carbon-free energy production goals through transmission infrastructure improvements?

*Ms. Hoffman. So thank you, Congresswoman, for the question. I think you highlighted, really, the important

opportunity, which is really to be able to access that generation that's available in the New England states and be able to access that for the benefit of the consumers in the region. Transmission also provides the opportunity where necessary and needed is to be able to transmit clean energy generation from other regions of the country as well as supporting the reliability/resilience of the region when it -- - resources potentially are not available. So from a perspective, transmission is really a key component and attribute to the clean energy strategy. It is a must-build investment as we move forward. And I -- I appreciate your question.

*Ms. Kuster. Great. Thank you. Now, one of the barriers to bringing new clean energy resources online are interconnection queues where projects wait as the cost of plugging them into the grid is evaluated.

Once that cost is determined, clean energy producers are forced to pay for any upgrades necessary to move new clean electricity onto the grid. However, when a project in New England is necessary for the grid's reliability, the costs of the upgrade are spread throughout the market. Our country, our planet faces an existential threat due to climate change. In the same way that everyone benefits from reliable electric grid, so too will all customers benefit from a clean grid.

And a grid with more clean energy resources is also a more reliable grid. Acting Assistant Secretary Hoffman, what role could the DOE play in supporting our efforts to make interconnection queues more efficient and ensure that cost of plugging new projects into the grid are allocated fairly?

*Ms. Hoffman. So thank you, Congresswoman, for the question, and it's a really important issue that you bring up to be addressed as part of this hearing today in that the interconnection queue is a roadblock with respect to how do we get more clean energy deployed on the electric grid. The Department of Energy does not have the primary responsibility for cost allocation with respect to technologies that are in the interconnection queue. But we do have the resources of the national laboratories to really take a hard look at the generation that is in the interconnection queue, upgrade requirements, the benefits and approaches for thinking about how to be innovative with respect to cost allocation moving forward, going beyond a single generator being responsible for providing upgrades to really looking at some of the approaches that others are taking of -- of really cost cluster studies or other opportunities for our cost allocation moving forward.

And so I think the value that we have is really looking at what is the optimal sense -- set of upgrades that could be done. How do we minimize the cost? But how do we really

look at the strategy for allocating cost?

*Ms. Kuster. Great. Well, thank you very much. I did have one more question that I'll submit for the record on how we can most effectively incorporate clean electricity projects into our existing transmission infrastructure. But my time is up, and Mr. Chairman, I yield back.

*Mr. Rush. The gentlelady yields back. The chair now recognizes the gentlelady from California, Ms. Barragan, for five minutes.

*Ms. Barragan. Thank you, Chairman Rush, for holding this important hearing on how investing in a national U.S. power grid would make electricity cleaner and cheaper while creating hundreds of thousands of jobs. As we see heat waves and record temperatures throughout the West, this puts a strain on our electric grid. Power outages are a constant concern and can endanger people who lose air conditioning and are unable to escape the heat. Assistant Secretary Hoffman, a recent 2021 Government Accountability Office report on the impact of climate change on the electric grid recommended a Department of Energy-wide strategy to enhance the resilience of the grid to climate change. Is there a department-wide strategy to improve the resilience of the grid to climate change or plans to create one?

*Ms. Hoffman. So thank you very much for the question. I will take that question back, but I do believe that the

department is looking at a climate strategy with respect to climate adaptation but look at the resilience of the electric grid. We have had several efforts where we have looked at how do we harden our infrastructure. How do we look at investments, whether it's local generation, distributed energy resources, microgrids, looking at a wide variety of technology solutions for investing in the resilience of our electric grid as well as evaluating interdependencies in different -- what I will say, extreme weather conditions that could impact the operations of the electric grid. So I thank you for your question, and I look forward to the further dialogue that we can have on this topic.

*Ms. Barragan. Well, thank you. My next question is to connect renewable projects to the transmission grid in a timely and cost-effective manner, interconnection reform is essential. While the current process worked when we connected large power plants to the transmission grid, looking ahead, we will have smaller but more numerous renewable projects seeking interconnection. Connecting a renewable project to the grid could take around three years. What is the most efficient way to promote interconnection for renewable projects to the transmission grid?

*Ms. Hoffman. So thank you, Congresswoman, for that question. The interconnection queue is one of the biggest challenges for connecting generation to the electric grid.

And really, analysis needs to be done on how do we do this in a very streamlined fashion. Individual project analysis for interconnection studies are not the most efficient way to go in moving forward. So although the interconnection queue is not -- and cost allocation under that is not the responsibility of the department, I do believe the department can provide some analysis on system upgrades, really looking at priorities for upgrades and maybe taking a larger, more systematic approach in analysis through the national laboratories to help streamline and maybe move the interconnection queue process moving forward.

*Ms. Barragan. Thank you. My last question is how can building a national energy grid help support the deployment of electric vehicles throughout the country?

*Ms. Hoffman. So thank you very much for the question. It's a huge opportunity, as we continue to invest in technologies that will accelerate the electrification of our vehicle fleet in the United States. The transmission system plays a critical role in enabling that continued advancement in the -- in the transportation sector. What we really want to do is really upgrade the distribution system, make sure that we have smart charging for -- as incorporated as part of the distribution system so that we can actually charge with providing charging electric vehicles while providing minimal impact to the distribution system. So some of those are the

technology and operational areas that we can invest in moving forward.

*Ms. Barragan. Well, thank you, Assistant Secretary, for your testimony and your work. We, the committee, and myself are looking forward to working with you to address this critical issue, along with climate, environment, energy.

And thank you, Mr. Chairman. With that, I yield back.

*Mr. Rush. The gentlelady yields back. And with that, this concludes our first panel of witnesses. Madam Assistant Secretary Hoffman, I want to thank you for appearing before the subcommittee today. Thank you for your excellent testimony and for your endurance. You answered our -- answered the questions of our members to their greatest conclusion, and we certainly want to commend you for your appearance and for your answers. This concludes our first panel.

And we have a vote that is occurring on the floor. So the chair would ask that the committee stand in recess for - until 10 minutes after the final vote is taken and before the last vote -- 10 minutes after the last -- after the end of the last vote. So I would -- the committee now stands in recess until 10 minutes and -- after the conclusion of the last vote.

[Recess.]

*Mr. Rush. The Subcommittee on Energy will now come to

order. And this is our phase two. And we ask -- we have before us four new witnesses for the second panel of witnesses for today's hearing. And it's my privilege now to introduce those witnesses. First is Dr. Susan Tierney. Dr. Tierney is a senior advisor for the analysis group. A second witness is Mr. Rob Gramlich, who is the founder and president of Grid Strategies, LLC.

Next, we have Mr. Lee Anderson, government affairs director of the Utility Workers Union of America. And last but not least, the Honorable Tony Clark, who is the senior advisor for Wilkinson Barker Knauer, LLP. And I want to thank each and every one of our witnesses for joining us today. And we look forward to your testimony.

Dr. Tierney, you are now recognized for five minutes, Dr. Tierney. You are muted, Dr. Tierney. Please unmute yourself.

Dr. Tierney is experiencing some technical difficulties, so why don't we proceed until we are able to eliminate the technical difficulties for Dr. Tierney?

Mr. Gramlich, you are now recognized for five minutes.

STATEMENT OF SUSAN TIERNEY, PH.D., SENIOR ADVISOR, ANALYSIS GROUP; ROB GRAMLICH, FOUNDER AND PRESIDENT, GRID STRATEGIES, LLC; LEE ANDERSON, GOVERNMENT AFFAIRS DIRECTOR, UTILITY WORKERS UNION OF AMERICA; AND TONY CLARK, SENIOR ADVISOR, WILKINSON BARKER KNAUER, LLP

STATEMENT OF ROB GRAMLICH

*Mr. Gramlich. Thank you, Chairman Rush, Ranking Member Upton, members of the subcommittee for holding this important issue focusing on transmission and inviting me to testify. My name is Rob Gramlich. I work with clean energy buyers and sellers, states, grid operators, and others interested in low-cost decarbonization and grid resilience. A few of my reports were mentioned in the committee memo with Americans for a clean energy grid, which is one group that I lead. And my background has been on transmission and power markets my entire career. My public-sector experience was with a chairman of FERC. He was a Republican member and appointed by President Bush. And I note that last time I was here, I was a Republican witness, and the hearing was actually very similar, the content of the hearing. A couple of the witnesses are the same, and I am going to say the same exact thing. So I hope I don't disappoint you. But I say that because transmission is a bipartisan issue. It is and it

should be back in those days when the Bush team was in charge around here. Transmission was more led by Republicans. These days, you see more Democrats out front.

But whoever is out front, I think both sides can get on board. And we have just a couple of differences from that May 2018 hearing, and that is that we have some -- a few specific legislative provisions now to discuss that have been vetted over the last few years since that hearing, and I think the politics and the policies are now ready to go, and it is time for Congress to act.

A few bipartisan messages while I am on that theme are, number one, everyone wants reliable and resilient power. A lot of the discussion this morning was about interregional transmission. Well, whatever you think about how much we need to decarbonize or how fast, that same interregional transmission is exactly what we need to keep the lights on. We saw what happened in Texas when their interregional capacity was limited. That is not what anybody wants to see. The other regions that had interregional transmission capacity did keep the lights on. People were safe.

So for whatever reason you might come to, interregional and large regional transmission capacity and delivering power over large geographic areas is critical to our safety, to our economy, to just about everything we do in modern society at home and at work. So everyone wants reliable power.

Transmission is critical to that. Number two, another bipartisan message, I think, is that transmission should be planned for future load and generation. A lot of utilities, a lot of end-use customers have certain resource choices that they are making. Whether or not they are driven by federal policy or state policy, whatever has motivated them, we know a lot about what the resource mix is that consumers are asking for and that utilities are putting into their plans. And so it seems just obvious that we should plan the transmission system for those generating resources. We know the generation side about as much as we know the load side. We can estimate both. We need to plan the transmission to connect the two.

Number three bipartisan message, the barriers to building large-scale regional and interregional transmission fall into the categories of -- we call them the three P's, planning, permitting, paying. You heard about that this morning. I think both sides acknowledge the barriers there and also that public policy changes are needed to address those barriers. And then finally in the context of the news today and this week about infrastructure legislation, hopefully bipartisan, transmission is infrastructure. In fact, it is underlying core infrastructure when you think about how necessary it is for food, water, medical, and first responder services. All of those other infrastructure types

rely on electricity, which relies on transmission. So transmission is really fundamental infrastructure for modern society.

So those four points, I think, reflect -- provide a good, solid bipartisan foundation for this hearing and this committee's work. And in my written testimony, I comment on some of the specific provisions that were put forth for this hearing. I think the CLEAN Future Act, Section 211 to 218 or the transmission provision -- provisions, those are a great start. There are a couple of updates or more recent modifications, including Representative Casten's interregional planning bill, H.R. 2678; Representative Peters' POWER ON Act, H.R. 1514; Representative Castor's new interconnection bill. I also recommend a provision that is over in the Senate side, the Manchin -- Senator Manchin Discussion Draft on a transmission facilitation program. I know the tax credit is not in this committee's jurisdiction, but that would be great for transmission. And so with that, my time is up, and I will turn it back. Thank you very much for having me.

[The prepared statement of Mr. Gramlich follows:]

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

*Mr. Rush. Thank you, Mr. Gramlich. And now we'll return back to regular order. I understand that Dr. Tierney's microphone is working. So Dr. Tierney, you are recognized for five minutes for the purposes of an opening statement.

STATEMENT OF SUSAN TIERNEY

*Dr. Tierney. Chairman Rush, thank you for your patience. I am really sorry. We try to get this right every time, and sometimes there is blips. Ranking Member Upton and members of the subcommittee, it is just wonderful to be here, and I really appreciate it. I have two main points to share with you today.

First, expansion of the nation's electric grid is essential to our country's energy transition. And second, the bills at the heart of today's hearings would constructively address very persistent impediments to planning for, investment in, and siting of transmission infrastructure that is so needed for the U.S. electric system to be fit for purpose in the 21st century.

I am testifying here on my own behalf. But in my written and oral testimony, I point to various relevant findings and recommendations of several reports of the National Academies, committees on which I have recently served. These committees recently released two reports, the Future of the Electric Power Study and a Decarbonization Study.

I am extremely pleased that many of the findings and recommendations in our two reports aligns so strongly with the purposes and provisions of the bills. The four bills

under consideration would deftly tackle many of the toughest challenges that frustrate responsible expansion of the nation's transmission grid.

Let me go through five challenges very briefly. The first is addressing difficulties in siting interstate transmission projects and regions' public policy objectives such as opening up access to renewable energy resources, reducing local pollution, and reducing congestion and cost to consumers.

The CLEAN Future Act would provide needed clarity on the goals that may be supported by transmission expansion and include not only electric system reliability and economic efficiency but also reducing air pollution and providing access to regions with abundant renewable resources.

The National Academies' Future of Electric Power Study recommended that Congress establish a national transmission policy to rely on the transmission system to support energy diversity, energy security, the nation's equitable transition to lower carbon energy system. And the decarbonization study made similar recommendations. The CLEAN Future Act nicely articulates such important elements of a national transmission policy.

Challenge No. 2, facilitating development of economical renewable electricity projects by planning for and opening up transmission access to regions with abundant and high-quality

renewable energy. The CLEAN Future Act would broaden the current definition of national interest transmission corridors to focus on those that are high priority for saving consumers money and for accessing and integrating location-specific renewable resources.

The Interregional Transmission Planning and Improvement Act would direct FERC to take rulemaking steps to increase the effectiveness of interregional transmission planning. These bills would address important potential transmission connections across regions to help with reliability, resilience, access to transmission to make sure that renewable resources are available.

Challenge No. 3, strengthening the role of national needs in regulatory approvals of certain interstate transmission construction projects. The CLEAN Future Act would clarify the conditions under which FERC would have authority to issue permits for construction of transmission projects in high-priority corridors and encourage the states to look at regional benefits when they review projects within their own borders.

Challenge No. 4, recognizing the benefits that accrue to states and their citizens, when, through transmission enhancements, they have access to broader interstate electrical regions and to the economic resiliency, reliability, and public health outcomes that those larger and

more diverse regions can provide. The CLEAN Future Act would direct FERC and the Department of Energy to undertake and implement actions to improve this transmission planning.

And each of the four bills that are under consideration here today would help with that. Finally, there are two other elements that address the fifth challenge of ensuring that transmission enhancements only occur when they are needed. And this is done through the CLEAN Futures Act clarification of the importance of non-wires alternatives in avoiding transmission where possible.

And secondly, the CLEAN Future Act and the POWER ON Act would support the essential role that tribes, localities and states must play in transmission planning and energy facility siting. The Academies' Future of Electric Power Study and the Decarbonization Study recommended the same financial incentives and analytic support to states, tribes and localities so that they can have a meaningful role in this process. Thank you.

[The prepared statement of Dr. Tierney follows:]

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

*Mr. Rush. I want to thank you.

Our next witness is Mr. Lee Anderson. Mr. Anderson, you are -- have five minutes for the purposes of an opening statement.

*Mr. Anderson. Thank you, Mr. Chairman. Can you hear me okay?

*Mr. Rush. I hear you quite well. Thank you.

STATEMENT OF LEE ANDERSON

*Mr. Anderson. Thank you, Chairman Rush. Thank you to Ranking Member Upton and to the distinguished members of the subcommittee. My name is Lee Anderson. I am the government affairs director for the Utility Workers Union of America. Our union represents around 50,000 workers in the electric, gas and water utility sectors. Our members have deep experience in operating, maintaining, and repairing the transmission grid. These are highly skilled jobs, and many of these disciplines require individuals to participate in an apprenticeship consisting of a thousand hours of on the job training delivered through labor management partnerships and include attendance at community colleges and other training facilities.

Just as businesses depend on transportation systems such as roads, railways, and ports for delivery of goods and services, electricity requires its own transportation. The wires needed to carry the electrons that are our product. Power transmission is, in that respect, perhaps more fundamental to underpinning the entire economy than any other system.

By some estimates, transmission investment holds the potential to create upwards of 240,000 direct jobs just in the buildout of those systems alone. In the emerging

offshore wind industry, for example, we see an industry which will require thousands of new workers to be trained for integrating power into the grid via transmission infrastructure to move the electrons from the towers to the shore and on to the load centers.

We see several examples as to how transmission investment will benefit buildout of the transmission grid for the offshore industry in some early areas. In Massachusetts, transmission terminations are planned to be at the Mystic Power Plant site and the former Pilgrim Nuclear Station. Also at the former Brayden Point Power Plant site, the planned Anbaric Renewable Energy Center will include an offshore wind logistics port, a manufacturing hub and support center, a battery storage facility, a converter station and solar power arrays.

In Connecticut, transmission terminations are planned to be at the Bridgeport Power Plant, previously the site of one of the last coal fire power plants in New England. The project would now share that location with a new gas-fired power plant, making the site itself a blend of generation technologies.

In New York, the UWUA has partnered with community colleges and offshore developers to begin designing a training program for the necessary workers. Here again, some of the earliest jobs will be in transmission upgrades and

buildout at sites around New York City. Another example of how a significant transmission buildout can transform the grid and grow the economy is with advanced nuclear technology.

Recently, Energy Secretary Jennifer Granholm, Governor Mark Gordon, and Senator John Barrasso came together in Wyoming to announce that an advanced nuclear reactor built in partnership by TerraPower and Pacificorp would be located in that state. Training former coal fire power plant workers to work in a nuclear power plant not only solves the challenge utility space as they work to enhance grid reliability and stability while meeting decarbonization and emissions reduction goals but also supports high-paying union jobs that will last decades while reestablishing a highly specialized nuclear talent pipeline.

However, without the energy highways, linking our members in Wyoming to large population centers in surrounding states, the future of their energy jobs would be bleak. In this respect, transmission lines are truly economic lifelines for what would otherwise be stranded workers and communities.

If the future of power generation is tech neutral, as we believe, nothing is more integral nor more tech neutral than the transmission systems that will carry the electrons from every power source in America to load centers around the country. These kinds of large-scale transmission investments

are exactly how an already existing and experienced workforce will pave the way to an all of the above energy future. The health of our communities, well-being of our union's members and competitiveness of our economy requires this type of action. I thank you for the opportunity today to be a part of these proceedings. I look forward to answering your questions.

[The prepared statement of Mr. Anderson follows:]

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

*Mr. Rush. The chair thanks Mr. Anderson.

Mr. Clark, you are now recognized for five minutes for purposes of an opening statement.

STATEMENT OF TONY CLARK

*Mr. Clark. Thank you, Chairman Rush, Ranking Member Upton, and members of the committee. It is a pleasure to be with you here today. For your record, my name is Tony Clark, senior advisor at Wilkinson Barker Knauer and former FERC commissioner, in which capacity I have appeared before you in the past.

I will begin by emphasizing something that I think you have heard a lot today from all of the panelists and, indeed, from members of the committee, which is the importance of electric transmission, as it is an integral part of the electricity delivery system in our country. Properly planted, constructed high-voltage transmission facilitates numerous customer benefits.

When it comes to reforming transmission policy, I'd urge the committee to follow the following principles. First of all, bottoms up, not top down. Any regional effort or any effort at interregional and regional planning and cost allocation for electric transmission should reflect the plans that are developed first at the state and local levels. They should not be an imposition of a predetermined federal solution that may not meet the needs of end-use customers in each of the states. Put another way, transmission and generation projects exist to support consumers. Consumers do

not exist to support specific generation and transmission projects. As such, any regional or interregional coordination must build upon what is being done at the state and utility level, not the other way around.

Second, respect regional differences. There is no one size-fits-all when it comes to generating and transmitting electricity in the United States. This is a large country with diverse natural resource bases, very different regional supply and demand characteristics. This diversity should caution against the federal government adopting policies that assume all regions need to -- need to meet their needs in the exact same way.

Indeed, transmission might be the best way to serve customers in a particular state or region. But in another state or region, those goals might be better met by accessing, for example, generation that is closer to load. Having said that, I do fully support efforts to decrease roadblocks to needed transmission investment. I would say as a side note, I was heartened recently by an announcement by FERC and NARUC, the association that represents state utility commissioners of a federal task force on electric transmission.

It seems to me that those sort of bottom-up efforts are exactly the kind of collaborative approaches that can ensure customers are put at the center of a grid energy -- energy

grid transition. Yet I would be remiss if I did not note my concerns that I had outlined in my submitted testimony that I do have with certain aspects of the pending legislation.

I believe that -- that the wrong outcome would be to put the federal government in the position of determining for states how their customers should be served. What I don't think you would want to have happen is someone sitting in a conference room in Washington, D.C. drawing bubbles around certain areas of the map where there are windy areas and other areas of the map where there are load centers and then drawing a line in between the two and developing plans based simply off that.

Under that scenario, you could see, then, the power of the federal government being able to overrule local siting and zoning protections. Once completed, those projects -- it is at least not outside the realm of possibility that the cost for those could be socialized across interconnection. That sort of income could have unintended consequences on local sources of generation, potentially consumer costs, other clean energy investments that are already being made at the local level and operations on the RTOs and ISOs themselves.

Now, while that outcome may not be what the committee intends, the language of the bill, at least as written, would not seem to entirely preclude such a process either. If it

is not the intention of the committee, my suggestion would be to simply say so in the bill itself. Finally, I would recommend deleting closely related language mandating RTOs and ISOs and establishing a so-called, quote/unquote, right to clean energy.

While I believe RTOs do certain things well, they may not be the only way to achieve clean energy goals. In fact, RTOs were not really designed to promote one particular resource over another, and they are not a cure-all for procuring clean energy. This conundrum is at the heart of the present multiple crises existing -- in existing RTOs related to price formation challenges and states that are unhappy with the generation resource mix that are being procured by the RTO.

RTOs may not be the best solution for all areas of the country, so this should remain a local decision. Regarding the establishment of the federal right to clean energy, the language would likely create a scenario where large corporate energy purchasers would be able to use their buying power to directly procure one particular source of generation of preferential rates while shifting other system costs like maintaining 24/7 reliability to other customers. This could become the sort of haphazard deregulation of the retail electricity business.

Traditional retail regulatory rules exist at the state

level to hold other consumers harmless when certain buyers wish to procure their energy directly, but this language could preempt such protections. With that, I will close my statement and look forward to taking any questions that you might have. Thank you.

[The prepared statement of Mr. Clark follows:]

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

*Mr. Rush. Thank you, Mr. Clark, and want to -- and need -- thank all the witnesses on this second panel. Now we are moving into the member questioning of the second panel witness. Each member will have five minutes to ask questions of panel two's witnesses. And I will start by recognizing myself for five minutes.

Mr. Anderson, I want to express my appreciation for your membership's tireless work to keep the lights on across our nation since the early part of the 20th century and for your being here today. My question to you is how will the build our -- buildout of transmission infrastructure benefit the hard-working members of your organization and the nation as a whole? And how can Congress support your membership in their work to expand transmission?

*Mr. Anderson. Thank you very much for that question, Mr. Chairman. The short answer is that all of those things, transmission buildout, operation, and maintenance and the power generation assets that they support are -- those are the things that actually create the tens of thousands or hundreds of thousands, really, of jobs in our industry. This is what our members do all day every day. They work on all of these energy systems, generating the power, transporting the power, building, operating, and maintaining all of the systems. That is the source of work for our membership.

And as to how it benefits the country, I think it has

been said several times here today that there is nothing more of a fundamental underpinning to the entire economy than electricity. There is nothing in modern society that can be done, frankly, without electricity. So in that respect, it is not just beneficial. It is absolutely necessary. What Congress can do to support this, to support our members, is two things.

One, by when we are analyzing how the buildout is going to happen, think about who is going to be doing the buildout, by which I mean where you really find the union workforce in this space is with the regulated utilities. There is a union density in that sector of about 22 percent, which if they were a state, which would make them about the second most union-dense state in the United States, on par with New York. Hawaii would be a little bit higher.

The point being that to the extent that the regulated utilities are building, operating, and maintaining these systems, you have a built-in guarantee of getting those kind of high-road family and community supporting jobs that we all are looking for. The second thing is that Congress can do all that it can to support these labor -- what I referred you earlier as labor-management partnerships or what I might call union apprenticeships. We have an apprenticeship program of our own that we developed with our utility employers that trains people to work on any number of systems, not just in

electricity but also gas and water. And those are not the sort of programs where you have to pay tuition, or you finish it and then you hope you have a job. You have a job from the very first day that you start.

And you don't pay tuition for that. You have a job. You are trained, and by the time you go through that program, you are literally one of the top technical experts in your field. So those two things, making sure that the utilities are integral to the buildout as much as possible and making union apprenticeship programs core to building the workforce.

*Mr. Rush. Thank you.

Mr. Gramlich, in your testimony, you expressed that building large-scale transmission networks to meet growing electricity demand and clean energy roles will bring well paying domestic jobs and benefit U.S. global competitiveness. Will you please elaborate on this point?

*Mr. Gramlich. Sure. Thank you for the question, Chairman Rush. There are, as you just heard from Lee Anderson, great domestic jobs potentials, potential with large-scale transmission. The jobs are high-quality jobs. They are nearly all union jobs. And the domestic content of transmission is also very high, starts -- starts pretty -- pretty high. So the manufacturing jobs upstream are good in domestic. So I think transmission is a great way to not only get direct employment in transmission, but also, it gives you

access to the -- the generation jobs.

*Mr. Rush. Thank you so much. I only have four seconds.

Ms. Tierney, what are the lesser-known benefits for buildout of the electric transmission grid to our nation's communities?

*Dr. Tierney. Several things. A more resilient system, a system in which people in different regions can rely on each other and save money on their electric bills, a reliable system and one that really can deploy domestic energy resources. Thank you, Mr. Chairman.

*Mr. Rush. Thank you so much. And that concludes my testimony. I now recognize the ranking member of the subcommittee, Mr. Upton, for five minutes for questioning the witness.

*Mr. Upton. Well, thank you, Mr. Chairman, and thank you, witnesses. This is a particularly timely hearing. That is for sure. I am hoping that we are able to get a bipartisan infrastructure bill to the President before the August break begins. And one of the important elements that has been not only in the House side but also in the Senate is a nice sum of funds for transmission, not only to protect against weather-related, as we saw in Texas this last March but also to protect against cyber attacks as we saw with the Colonial Pipeline. And knowing that we may need to triple

the size of transmission as the system by 2050, we better start on the right path. So Mr. Gramlich, I really appreciated your words and not only your past but today in terms of needs to be bipartisan. We have no -- there are not a lot of more important issues than making sure that we deliver energy at the best price to the consumers across the country, whether it be for their home or for their workplace.

Mr. Clark, you had quite the kudos from our colleague from North Dakota earlier. I don't know if you were here for those words. But Mr. Armstrong is going to be back. But given your experience at the state and federal level, what are some of the biggest challenges that you see to developing more transmission?

And particularly, I want to go back to the EPACT 05 where we tried to give FERC the federal backstop siting authority. But that didn't work so well. And I'd like just to -- if you could just walk us through that, what your experience was.

*Mr. Clark. Sure. Ranking Member, you are correct. There are numerous hurdles to getting transmission sited. It is not easy to do. EPACT 05, I was, as I noted in my testimony, a little bit of an outlier probably among some of the state regulatory community in that I thought it made sense to have some sort of backstop siting authority when there was true reliability needs that might be put at harm,

and you just can't get a transmission line built. And so it was a fairly narrow compromise that I think came out of that. Subsequent court decisions, in many ways, have really neutered that -- that backstop siting authority.

And so there are -- there is sort of a reattempt, it looks like, in this legislation to enact federal siting authority. I would say this is much, much broader as proposed in -- in this legislation. It broadens it out to include projects that might just be good for hooking up renewables. And it does so in a way that preempts states probably more aggressively than that original legislation did.

I would say that one of the most helpful things that this committee and Congress can do would be to reform government, federal government permitting processes themselves, which is something you don't need to do without getting into backstop siting authority. Ask any state regulator in the western half of the U.S. for sure that has to do with federal lands issues. And they will tell you one of the biggest hurdles is simply trying to get permitted through federal land type issues. So I think there is significant things Congress can do itself reforming the federal government's process with regard to permitting that would be incrementally helpful.

*Mr. Upton. Mr. Gramlich, what is your reaction to

that?

*Mr. Gramlich. Well, I largely agree with Mr. Clark on that. The legislation before you fixes one of those court decisions. And that is the primary purpose. But I might also suggest that the committee consider. If you are going to go in and touch something that, you know, addresses difficult eminent domain issues, you might want to look at the whole construct of that EPACT 05 corridor designation at one agency and permit at another agency where you have NEPA, a few years of NEPA at one place and a few more years of NEPA at another place and just say maybe let's keep it surgical and targeted. Maybe just say something over a thousand megawatts that crosses multiple states is FERC jurisdictional to permit.

Mr. Upton, you mentioned parity with gas pipelines. I mean, that gets closer to gas pipelines. We would love to have parity with gas pipeline permitting on the electric side.

*Mr. Upton. Well, I just know that as we look at more renewables, a number of us had dinner last night with former Secretary of Energy. And he talked about, as we see renewables expand, I think most of us here support that. You are still going to need something for when the wind doesn't blow, and the sun doesn't shine. And in large part now with the decline in coal, it has got to be gas. We have got a new

gas plant that is being built in my district, over a billion-dollar new facility that should be online in the next number of months. We had real issues on siting, just with Amtrak and making sure that right of ways and everything else would -- delayed it for some time. So I think we need to figure that out as we look to the future.

With that, Mr. Chairman, we'll yield back. And again, thanks for doing this hearing.

Thank you, witnesses.

*Mr. Rush. The gentleman yields back. The chair now recognizes the gentleman from California, Mr. McNerney. You are recognized for five minutes.

*Mr. McNerney. Well, I thank the chairman. And I thank the witnesses. Mr. Clark, thank you for your years of service.

Mr. Gramlich, during times of peak demand, California imports power from neighboring states that have large amounts of solar and wind energy. However, many of the merchant transmission lines that have been planned for the purpose of delivering renewable to California have been stalled while in development. And that's kind of a problem that we are talking about here today. Can you describe what measures can we take to encourage more merchant transmission projects that won't be stalled out?

*Mr. Gramlich. Yeah. Thank you for the question,

Congressman McNerney, and for your leadership on renewables and transmission over the years. I think the main problem with these large interstate lines, whether they are merchant or utility lines, is we don't have a way to recover costs of the interstate highway type lines in our system. All of you in your own districts have utilities that are able to recover in rates that are investments for their local transmission and distribution systems.

And that is how the electric industry grew up. But we don't have a way to recover costs of the large interstate highway type of lines. And those are the lines we need for resilience and for clean energy. So you have these merchant developers who are out there trying to provide this service. But there is no customers, really.

So I think my suggestion would be to look at, first of all, the tax credit, which is in the Ways and Means Committee, for large regionally significant lines and, secondly, I would urge you to consider a bill that was in Senator Manchin's discussion draft called a Transmission Facilitation Program where the government could essentially finance part of the line. And then over time, as transmission customers come on, they pay their taxpayers back.

*Mr. McNerney. Thank you. Good suggestions.

Dr. Tierney, as a Californian, I am very concerned about

wildfires and the effects of extreme weather on the grid. In particular, overgrown vegetation near transmission line can cause fires to proliferate. Can non-wires alternatives like those identified in Section 214 of the CLEAN Futures Act reduce the need to deploy transmission lines in the areas that are prone to fires?

*Dr. Tierney. Thank you, Congressman. This is a great question. I do think that there are many circumstances under which non-wires alternatives could provide a solution, at least to avoid or delay a new transmission line. Looking at the wildfire region that is in your neighborhood, things like microgrids could be a way in which one could provide an alternative to reinforcing a transmission line, provide local support for community needs and so forth. And those microgrids could provide power in the event that lines had to be taken out of service for wildfires. So that is just an example. There are lots of other examples as well.

*Mr. McNerney. Thank you.

Mr. Gramlich, again, one of the main challenges we face in bringing renewable energy from generation to load centers is clearly constructing those large backbone transmission centers. You discuss the importance of having proactive transmission planning that would reduce the cost and expedite the interconnection. How would you explain the transmission planning process that fails to connect new generation, and

what policies should we be looking at to be more proactive?

*Mr. Gramlich. Sure. Thank you for the question. We need to simply plan transmission. We are really not doing it in most regions right now. Transmission, quote/unquote, planners, are essentially waiting for each generator to come into the queue and responding to generator by generator when, in fact, they know based on the utility goals, consumer -- stated consumer preferences, state laws, that there is going to be X amount of generation of this type and at these locations. So all we need to do is proactively plan the transmission system to those areas.

I know FERC is trying to do that. But the planning and interregional planning provisions in the CLEAN Future Act and Congressman Casten's interregional planning bill would help a great deal with that and urge FERC to undertake a rulemaking to fix that and do the proactive planning that we need.

*Mr. McNerney. I yield back.

*Mr. Rush. The gentleman yields back? Does the gentleman -- the gentleman's time is concluded. The chair now recognizes the ranking member of the full committee, Ms. McMorris Rodgers, for five minutes.

*Mrs. Rodgers. Thank you, Mr. Chairman. Appreciate the witnesses being here today. In the Pacific Northwest, we have abundant clean, reliable, affordable hydroelectric power. We enjoy some of the lowest electricity rates in the

country. We even export our energy to California when it needs its power, and it seems like that is increasingly the case. I get concerned about policies that would drive up rates on our manufacturers and on our families. And I don't know what the southeastern United States would do if policies were imposed on that region, which has high energy poverty rates.

So Mr. Clark, I wanted to ask if you would talk about the need to respect regional differences when it comes to electricity generation. How does this help ratepayers? And please explain to us why provisions in this legislation may harm people because of the regional differences.

*Mr. Clark. Sure. Ranking Member, thank you for the question. I think when we talk about regional differences, the Pacific Northwest might be one of the best examples that we have in the country. As you indicate, the Pacific Northwest is unlike just about any other region that I can think of really anchored around that federal hydrosystem that exists up there and especially around the Bonneville transmission lines that hook up so much of the Pacific Northwest. There are a lot of regional efforts that are going on in the Northwest, for example, where there are discussions amongst the states in the region about how to account for and make sure that resource adequacy is maintained. Resource adequacy is the idea that not only do

you need to plan the transmission grid, but you need to ensure that there are available resources 24/7 under a variety of weather conditions and system operating conditions.

So the Pacific Northwest has been neck-deep in -- as a region in looking at those sort of efforts in a way that makes sense for that particular region. My concern would be if the federal government were to just come in and say "mandate,'' you have to have one particular type of market model like an RTO or an ISO which is traditionally not worked in the Pacific Northwest due to a lot of it's -- the specific things about that region, that it could cause some of the really good efforts that are going on within the region to fall apart.

*Mrs. Rodgers. Right now, Bonneville Power Administration is considering joining the Western Energy and Balance Market. And part of that is the benefit that then we would have the ability to sell our excess power to California. I wanted to just ask your thoughts on that and if you would think it would be different if we were forced to join the California ISO.

*Mr. Clark. Sure. Ranking Member, the EIM is a little bit different concept than the full RTO. EIMs have been becoming more and more popular across especially parts of the West. Basically, they allow utility system -- systems to run

their generators to meet their own system needs but to the degree they have excess energy, which is often the case with renewables, during certain hours of the day or maybe short a little bit during other hours of the day, they can trade energy across a platform that enhances the market.

Some of my colleagues and I have been referring to that as an emergent market as opposed to a more prescribed one. An RTO, as I indicated, has, for a lot of reasons, had a very difficult time taking root in the Northwest. Some of the concerns from local officials is a lot of that -- that locally generated, very affordable hydropower might then be exported to other parts of the country, and their rates might go up if that happens. So imposing an RTO from a top down, I think, becomes particularly problematic, especially in certain regions.

*Mrs. Rodgers. Well, I really appreciate you being with us today. I am going to yield back.

*Mr. Rush. The member yields back. The chair now recognizes the chairman of the Environmental Subcommittee, Mr. Tonko, for five minutes.

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

Dr. Tierney, regarding proposals to address backstop authority, would you please expand on your views as to why FERC may be better suited than DOE to designate corridors for high-priority lines?

*Dr. Tierney. Representative Tonko, thank you for that question. I really appreciate it. And I know I can answer this from the perspective of the two National Academy studies that I was part of because in both studies, the committees recommended that FERC would have backstop siting authority as well as the authority to designate needed corridors.

Now, the reason for that is FERC is a regulatory agency. It makes its decisions based on evidentiary records. It has a long-standing culture, a set of authorities, requirements and provisions that are used to making very tough calls on robust records. And in our view, the committee members' view, the -- putting -- enabling somebody like the Department of Energy to provide evidence about transmission plans, a variety of national needs and so forth, having FERC actually make decisions about the corridors and then step in to certify projects would address many of the siting hurdles that we know today. Let me leave it at that, but I am happy to follow up with more if it is helpful.

*Mr. Tonko. It certainly would. So we welcome any additional info you wanted to exchange with the subcommittee.

Mr. Gramlich, what is your perspective on DOE or FERC leading to designation of corridors for high-priority lines?

*Mr. Gramlich. Well, I certainly agree. Thank you for the question. I agree with Dr. Tierney about FERC's capabilities in that area. And I mentioned before the

awkward two-step double-agency, double-NEPA approach that we currently have which is suboptimal from any perspective.

FERC is equipped to do that. But, you know, I would also just think about whether you even want to have the whole corridor designation process at all if you are going to go in and try to improve this provision, maybe just establish a bright line and say what is -- what is for FERC and what is not.

*Mr. Tonko. Thank you. And interregional projects could play an important role in achieving a low-cost clean energy transition. But today, RTOs do not have good processes in place to evaluate these types of projects. So Mr. Gramlich, given today's processes for consideration of interregional projects, do RTOs' planning tilt too far toward considering and selecting regional over interregional projects?

*Mr. Gramlich. Well, there is an unfortunate and probably unintended consequence of recent FERC orders or FERC orders going back the last decade. Encouraging -- they sort of make it easy for the local investments. And that is probably okay given a lot of the assets are 70 years old and do need to be replaced.

But we are really not building any of the large regional or interregional transmission. It is just not coming out of the plans. So we need to plan for the future, as I said

3839 before, which seems -- seems simple. But I think Congress
3840 should encourage FERC to undertake a rulemaking to make sure
3841 that happens.
3842 *Mr. Tonko. And could a FERC rulemaking provide the
3843 direction necessary to get RTOs to use similar methodologies?
3844 *Mr. Gramlich. Yes. I think it could. FERC's
3845 authority is quite strong in --
3846 *Mr. Tonko. And should --
3847 *Mr. Gramlich. -- transmission planning.
3848 *Mr. Tonko. And I would ask also should they analyze
3849 these projects, evaluate them to see what their merit is?
3850 *Mr. Gramlich. Yes. They should look at these regional
3851 and interregional opportunities, include the resilience value
3852 because remember a lot of these lines, Mr. Clark and I both
3853 commend the MISO Multi-Value Projects in the Midwest. Those
3854 lines were justified based on west-east flow for renewables
3855 out of the region, but they kept the lights on during Winter
3856 Storm Yuri in February by flowing the power the other
3857 direction. And that is what transmission does. It gives you
3858 options, and it provides resilience once you get it built.
3859 *Mr. Tonko. And Dr. Tierney, what else could FERC
3860 clarify to promote improved interregional planning?
3861 *Dr. Tierney. Well, one of the reasons that I like the
3862 CLEAN Future Act as well as the POWER ON Act, actually, all
3863 four of the acts is that they do talk about resilience,

environmental improvements, diversity of supply, in addition to just the dollars and cents associated with transmission investments and the reliability benefits. And having the direction from Congress that it is in the national interest to be looking at transmission to support this array of goals would help FERC make decisions with regard to planning, cost allocation, and other things.

*Mr. Tonko. Thank you very much.

Mr. Chair, I yield back.

*Mr. Rush. The gentleman yields back. The chair now recognizes the gentleman from Ohio, Mr. Latta, for five minutes.

*Mr. Latta. Well, thanks, Mr. Chairman, and again, thanks to our witnesses for being with us this afternoon. Really appreciate it.

Commissioner Clark, if I could start my questions with you, you know, considering the cyber threats that are directed at our grid on a daily basis, what is your opinion on prioritizing the efforts to harden the grid against other cyber attacks over the long-term? And how long is it going to take us to make sure that we get the grid hardened?

*Mr. Clark. Mr. Chairman and Congressman, cyber concerns are one of my top concerns. They were during the four-and-a-half years that I was on the commission. And I think most FERC commissioners and state commissioners that

you talk to will probably tell you the same thing. And I don't know that we are ever going to feel like we are in a spot where cybersecurity is taken care of, and we don't need to worry about it anymore. I just think it is going to be part of an evolving process that we have to be -- that we have to stay on top of.

I think the commission has done a lot to make the grid better, to make it more cybersecure. But as we have seen from recent attacks, there is still a lot of work to go. From a FERC standpoint, which is the area that I am most familiar with, really what it is about is creating an ecosystem that makes it as difficult as possible so that, from an operation standpoint, operators are doing the baseline of things, sort of the floor, in terms of trying to protect their networks.

But there is a lot that has to happen on top of that. And it is a lot of work for the operators themselves because ultimately, it is not government who runs those networks. It is those individual operators. They have to have the ones that have the access to the information, the ability to block cyberattacks.

*Mr. Latta. Let me just kind of go into that because, again, I know back -- back in Ohio and going through different of our -- different companies and also with our co-ops, I tell you when you look at what they are doing out

there today, I mean, cyber is at the top of the list. So when you are thinking about what the federal government needs to be doing too, I know you just said that you have to look at the -- what the companies are doing or the providers are doing.

You know, it is that interaction between the federal government and those companies out there that have to be doing this. Is there enough information being provided on - you know, on an instant basis to make sure between the providers themselves and then also with the federal government to make sure that they can, you know, withstand the attacks after the cyber attacks happen to one?

*Mr. Clark. It can always be improved. And one of the more promising type of efforts that I saw during my time at FERC was things like the fusion centers, local fusion centers where government was tracking and seeing what was happening on some of the networks in a broader context, but then they could provide a feedback loop to get that information quickly to the local utilities themselves so they can implement the sort of processes and patches that they need to, to protect the network. So that really is a big part of the key, is that feedback loop between what federal officials see as well as what the operators themselves are seeing so that -- that they can protect those networks.

*Mr. Latta. You know, also -- you know, in reading your

testimony, maybe you could just delve in a couple of these things. I think it is interesting, and you brought up in your opening statement about the respecting regional differences and the bottom-up, not top-down. Would you want to get into, especially with our regional differences, when you talk about that, you know, one size doesn't fit all. And do we have a situation out there were the federal government is creating situations where we do have a situation where they want to have a, you know, one size fits-all for everybody to try to fit into that box?

*Mr. Clark. Congressman Latta, I would say the -- if you look at the most successful programs that have gotten, say, transmission built -- for example, Mr. Gramlich talked about the MISO MVP suite of lines. The reason that happened was because it was built from the bottom up, and you had local, state, and utility buy-in into a plan that seemed to work for the entire region.

I think what I would seek to avoid or would urge you to avoid in congressional legislation is you don't want the federal government to be picking out the lines where it thinks they should go and then maybe connecting into regions and really undercutting some of the investments that may happen in local regions.

For example, I mentioned the Pacific Northwest has a very unique profile in their grid. There are certain parts

of the country that rely very heavily on nuclear plants. If you build a lot of lines with zero fuel cost resources and flood the market with zero fuel cost resources, uplift the cost of transmission in a region that has very large nuclear plants, that is very likely going to cause economic distress for those nuclear plants, and we can't afford to lose those resources in terms of trying to reduce carbon emissions. So it is a complicated network, and that is why it is so important that whatever is done nationally has to be leveraged and based on the decisions that are being made at the state and local level.

*Mr. Latta. Well, thank you very much, Mr. Chairman. My time has expired, and I yield back.

*Mr. Rush. The gentleman yields back. The chair recognizes -- now recognizes Ms. Schrier for five minutes. The chair now recognizes Ms. Matsui for five minutes.

*Ms. Matsui. Thank you, Mr. Chairman. I want to thank the witnesses for appearing before us today. 2020 was a record-setting year, wildfires in California. Wildfires burned through nearly 4.5 million acres, making this the largest wildfire season in California's modern history. These fires ravaged through more than 4 percent of the state's land, and the threat of wildfires combined with historic heat waves cause rolling blackouts.

For this reason, I introduced the Preventing Outages

with Enhanced Resilience and Operations Nationwide Act of 2021, or as it is called, POWER ON Act of 2021, which is not to be confused with Mr. Peters' great legislation with the same acronym. This POWER ON Act that I had is a bipartisan and bicameral bill to establish a new electric grid resilience grant program at DOE focused on grid-hardening for extreme weather events.

Mr. Gramlich, can the deployment of grid-enhancing technologies, such as dynamic line ratings and advanced conductors, reduce the risk of wildfires posed by certain transmission lines?

*Mr. Gramlich. Thank you for the question, Congresswoman. Yes. Grid-enhancing technologies, I am so glad you asked about that. We have not covered it much here. But we -- while we endeavor to expand transmission capacity, we really need to make sure that consumers and people care -- who care about the land that could be impacted are assured that we use grid-enhancing technologies to deliver as much as we can over the existing network first.

And then in addition to that, as you just indicated in your question, they can often help a great deal with reliability and resilience situations. In emergency conditions, often we re-rate transmission lines. That is one example of the type of thing we can do. We can actually push and pull power over different routes now with modern

technology. So grid-enhancing technologies are a great opportunity to do that.

*Ms. Matsui. Well, how about the use of advanced conductors usually selected for high-capacity and efficiency? Can they provide wildfire mitigation and resilience?

*Mr. Gramlich. Yes. Advanced conductors can reduce the sag, for example. They are -- they can be much more resilient than the standard transmission line. And sag is a problem because the lines can dip into vegetation and spark a wild -- spark a fire. And so if you can reduce the sag with advanced transmission conductors, then you can reduce that risk.

*Ms. Matsui. Okay. Climate change poses a variety of threats to our communities. According to report from the U.S. Global Change Research Program, climate change will cause a wide range of negative impacts on public health, including increase premature deaths and respiratory illnesses due to decreasing air quality. And increase heat related death due to rising temperatures, among other disruptions.

For this reason, I introduced the TREES Act, my bill to reduce energy bills through residential tree planting while combating heat islands and co-lead the Climate Change Health Protection and Promotion Act with Representative Matt Cartwright.

Dr. Tierney, in your testimony, you mentioned that

transmission infrastructure enhancements and increased access to broader interstate electrical regions can help resiliency, reliability, and public health outcomes. Can you expand on the social benefits that transmission system investments will have and how Congress can help maximize these outcomes?

*Dr. Tierney. Congresswoman, I love that question, and I love your bill. I am very aware of this heat island problem, and tree planting is very, very important. But more broadly, transmission can help on local public -- public health issues where there are today highly polluting fossil generation where there are front-line communities that are living very close to those very aged facilities. In some cases, they cannot be retired unless there is either a replacement there potentially for local reliability issues or transmission is built to widen the availability of access for that community to power, say, from renewables that are distant. So transmission can help enable avoidance of local pollution in very important ways. And I think that this is a really important issue that I hope people will consider.

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

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

*Mr. Rush. The gentlelady yields back. The chair now recognizes the gentleman, my friend from West Virginia, Mr. McKinley, for five minutes.

*Mr. McKinley. Mr. Chairman, that is West by God

Virginia. Let me just continue on with this. I have really enjoyed this kind of political, tainted conversation we have had about transmission lines and -- but I don't want to go down that rabbit hole. I think there is an alternative that we don't have to face all the problems because they are telling me we may have hundreds of thousands of miles of transmission lines we have to put in as we make this transition.

So I'd like to talk a little bit about how we might be able to use carbon capture as a way to keep our coal-fired fossil fuel fleet still available. And I want to use the illustration of land use when we make this conversion, this transition over to wind or solar.

So this would take one power plant in West Virginia. It's a -- the Amos Power Plant is about 3,000 megawatts, a pretty good-sized facility but not the biggest in the country by any stretch. The 3,000 megawatt -- our consultants that we have been talking to for the last month and a half have indicated that we were going to have to -- if we have two-megawatt wind turbines apiece, we will have to have a total of 4,250 wind turbines to be able to service that 3,000-megawatt power plant, now, because we have to also charge the batteries for the backup.

So I understand. I am not going to argue over that 4,250. Now if you use that, now the math comes in. If the -

- if what we are hearing from the National Renewable Energy Laboratory in their report has surveyed, they went back through, and they looked at 172 large-scale power wind farms. And they came to conclusion that you need to have about two-tenths of a square mile per windmill.

So now do the math back again to what I just said, 4,250 at two-tenths. That means I am going to have to have eight -- I am going to have 850 square miles, 850 square miles of land committed to putting windmills on. Eight hundred and fifty square miles.

Now, what does that look like? That is one-and-a-half times larger than the entire city of Houston. It is for Chairman Pallone's district up in -- up in the 6th District of New Jersey. It is four times larger than his entire congressional district just to put in windmills, wind turbines, for one power plant in West Virginia. So I am astounded with that, and I am wondering is this the best use because I think we heard earlier today to get 850 square miles, I am going to have to have imminent domain. I am going to have to have a series of litigation that I am going to have to go through. So for us to get to 2030 or 2035 with renewables, I don't know how in the world we are going to get to that.

If one power plant requires 850 square miles just to put in a wind farm. So I am -- I ask, Mr. Clark, if I could just

focus on you for a moment. Is that the best use of our land, or would it be better if we were to convert -- use carbon capture and keep our power plants still as -- we are going to eventually go to renewables. I understand that. But just we -- maybe we don't need to do it so quickly that we can come up with another system. Can you react to that?

*Mr. Clark. Congressman McKinley, the way I would put it is utility companies and generating companies build different resources for different reasons. And every resource has its place. So the future will have some mix of a number of different resources. And as you indicate, renewables, I believe, will be a -- a big part of it. The question that you ask which I think is exactly right, which is we still have to focus on ensuring that there is dispatchable resources on the system available to accommodate the amount of renewables that are being -- will be coming on.

In a carbon-constrained world, which is generally where the arc of the generation fleet is moving, it means we -- be serious about figuring out ways to have carbon-free dispatchable resources. That includes things potentially like carbon capture and sequestration with existing plants, nuclear generation, so on and so forth.

*Mr. McKinley. Mr. Clark, if I could, do you think they are wrong, the National Renewable Energy Laboratory, two-tenths of a square mile. You have heard --

*Mr. Clark. Congressman --

*Mr. McKinley. -- the wind turbine?

*Mr. Clark. -- I don't know that I have seen that particular one, but the issue of energy density and the fact that it takes a lot more land use with renewables as compared to, say, a smaller footprint --

*Mr. McKinley. I am just running short of time, obviously. I just want -- it is a reality check to realize what we are about to do here in pursuing because if we can keep our coal-fired -- fossil fuel-fired power plants, we are not going to need this transmission problem, as it go - it at least is mitigated. We are not going to need as much as we would have otherwise. We could go to a hundred percent by 2030 or 2035. So with that, Mr. Chairman, I know I have yield -- gone over but thank you. Yield back.

*Mr. Rush. The chair now recognizes Ms. Schrier for five minutes.

*Ms. Schrier. Thank you very much, Mr. Chairman. And thank you to our witnesses. I am very interested in how we can identify ways to better use our power marketing administrations to support the deployment of transmission, which I believe we need regardless of what energy portfolio we need because we need redundancy and resiliency. Mr. Gramlich, in your testimony, you state regarding the facilitation of interregional transmission that another

option is for greater use of the power marketing administrations which have expertise in transmission planning, valuable local relationships, and authorities to permit transmission and partner with private investors. It seems that if they could lead here, it could be a real win win, facilitating the deployment of more renewables and hydroelectric energy while also continuing to improve grid reliability and redundancy in the Pacific Northwest. And I was wondering if you could just expand a bit on your statement.

*Mr. Gramlich. Sure. Thank you for the question. Yes. Power marketing administrations are -- play a key role in transmission. They can -- with their loan authority, they can go ahead and develop and build some transmission. They can expand the seams capacity between the Eastern and Western interconnections. That would be WAPA. And they also, as you mentioned, can use the authority in Section 1221 of EPACT 2005, which allows the PMAs to partner with private investors and private capital to build transmission. And the PMAs in that case bring a lot of expertise, local relationships and permitting authority to get transmission built. And that can be utilized in the parts of the country where the PMAs exists, which is a little over half the country.

*Ms. Schrier. And that is what we have in Washington state. So that is really interesting to hear about the

partnership between the two. I know that in your testimony, you talked about kind of a transmission facilitation program in which the Department of Energy reserves up to half the capacity of a new transmission line and then sells that capacity to other users. Is that the kind of relationship with private industry that you are referring to?

*Mr. Gramlich. That is another example. It is sort of a loan program. And it appeared in public, I think, in the first time about a week ago in Senator Manchin's discussion draft. And I commend that provision.

*Ms. Schrier. And would that benefit a state like Washington where a federal power marketing administration is responsible for a significant part of the transmission system?

*Mr. Gramlich. Yes. I think it would be -- apply in the northwest. You might check with Senator Cantwell's office. I think she is very interested in that type of provision.

*Ms. Schrier. Fantastic. I will follow-up and I thank you for your comments and yield back the remainder of my time.

*Mr. Rush. The gentlelady yields back the balance of her time. The chair now recognizes Mr. Johnson from Ohio for five minutes.

*Mr. Johnson. Well, thank you, Mr. Chairman. We have

covered a lot of ground today with several sections on transmission. But I am going to focus on a couple of them that are particularly concerning. First is Section 220, establishing something called a federal, quote, right to clean energy. Now, that is interesting. Mr. Chairman, I don't know about anyone else's district, but I can assure you that in eastern and southeastern Ohio where I live and represent, the people are not pounding down my door demanding their right to clean energy.

What they really want for their families is affordable, reliable energy. That is my main concern, and it should be the main concern of this committee. Anything else is an intentional failure to grasp the reality of what the American people face every day. Ironically, even individuals or businesses who would actually like to pay higher prices for their so-called clean energy still need a backup for intermittent renewables for when the sun doesn't shine, and the wind doesn't blow.

What is that backup? You guessed it. Cheap, reliable and affordable natural gas and coal paid for by everyone else. So Mr. Clark, in your experience as a state utility regulator, your first priority was delivering electricity on demand at the best price. Can you explain to us why this, quote, right to clean energy, why that section coupled with federal preemption of state or regional rules would not be

the right approach if the goal is to provide the best, most affordable, most reliable electric service to the American people?

*Mr. Clark. Congressman, sure. I suspect that the provision is being supported, especially by large corporate energy buyers who might like to directly procure energy outside of existing regulated relationship that they might have in the areas in which they do business. And by establishing a, quote/unquote, federal right to clean energy to purchase it from anywhere, it would allow them to do so, sometimes to meet, I suppose, their corporate sustainability goals, number one, but also to get preferential rates that they can get because they are very large energy buyers.

The problem with that sort of system is it can leave other system costs to balance and maintain 24/7 reliability existing with the remaining customers on the system, and then they have to pick up the tab for that. State regulators that you mentioned typically have processes to ensure that when a large buyer wishes to get direct special access to a resource that they do it as part of some sort of proceeding in front of the state commission.

The state commission can then balance interests and make sure that average customers are held harmless so that the sort of little guy, the residential customer, the small business customer, doesn't end up subsidizing those choices

for the large customer who wishes to leave the system. I would be concerned that a federal establishment of a right could undermine those protections that exist at the state level to make sure that that cost shifting does not --

*Mr. Johnson. Okay.

*Mr. Clark. -- happen.

*Mr. Johnson. All right. You also outline, Mr. Clark, some concerns with Section 211, citing regional differences in choosing what investments make sense for certain areas. And you make the case that we should pursue cleaner energy sources as free-market innovation facilitates it rather than a mandated one-size-fits-all approach. In past hearings, I have cautioned about not wanting to lock into certain technologies when, down the road, technological breakthroughs, perhaps with hydrogen or advanced nuclear, might render them obsolete.

This pertains to wind, solar and their thousands of miles of new transmission lines in particular. When you consider the millions of tons of glass, concrete, steel, land and rare earth metals that we depend on communist China for, among other materials, it is staggering. We certainly should think twice about whether this is wise stewardship of taxpayer dollars, not to mention preserving the American landscape, which all of these wind and solar farms would blight. So Mr. Clark, this legislation, in unprecedented

fashion, mandates preferential treatment for current renewable technologies. Once again, it is Congress trying to pick winners and losers. Can you talk about the unintended consequences of this approach, especially when forced on the entire country?

*Mr. Clark. So Congressman, as I indicated before, I think every resource does have its place. And in my home state and region of the Midwest, for example, wind has been traditionally a fairly popular option. And there have been transmission lines. But -- built to accommodate that. That doesn't mean it is necessarily the right answer everywhere. I know there are large parts of the country, especially in the southeast, that have depended on nuclear power. And that may be -- sort of local nuclear generation may be a better way for them to meet carbon reduction goals than importing wind, say, from, you know, several thousand miles away.

So that is why I say it really has to be built from the bottom up based on those plans that are made at the local level in order for these decisions to be -- have some sustainability.

*Mr. Johnson. Okay. Well, thank you. Mr. Chairman, I yield back.

*Mr. Rush. The chair now recognizes the gentlelady from Florida, Ms. Castor, for five minutes.

*Ms. Castor. Thank you, Mr. Chairman. Thank you to our

witnesses for being here today.

Mr. Gramlich, you note in your testimony that there are hundreds of gigawatts of proposed power projects stuck in these interconnection cues. My bill, 4027, the Efficient Grid Interconnection Act, would direct FERC to use a beneficiary pays principle to cover the network upgrade cost. Talk to us about this and how you see it helping consumers save money eventually on their electric bills.

*Mr. Gramlich. Sure. Thank you for the question, and thank you for the bill. I think it is a great bill, and what it does is it makes sure that it is not just the next car on the highway that has to pay for the whole lane expansion, that everybody else in the future is going to use. That is what is happening with our transmission system right now. We are essentially trying to plan a transmission system through the interconnection process. And it is a sequential process. So these generators kind of pile up in line in the queue.

And the next one that sort of -- the next straw that breaks the camel's back triggers that upgrade that is needed, and then they have to pay for it when, in fact, once it is built, it is, by definition, a shared network. It is used by everybody. And so what your bill does is that it makes sure that all the users of the system will pay their share. It doesn't prescribe -- your bill doesn't prescribe exactly who pays how much. FERC would have to do that. But at least it

takes this most egregious option off the table.

*Ms. Castor. Dr. Tierney, what do you think about this bill and how we want to reduce congestion, break up this traffic jam?

*Dr. Tierney. Well, I would agree with everything Congresswoman, that Rob Gramlich just said. One of the problems here is this chicken-and-egg problem and the fact that the first party in has to pay so much of the cost, and then it is a staggering impediment to actually going forward with investment.

So spreading these costs around amongst a broad group of beneficiaries as your bill would do would really help make sure that a suite of projects can come forward economically and that's --

*Ms. Castor. And you --

*Dr. Tierney. -- good for consumers.

*Ms. Castor. You see that as -- yeah. So is that a good -- is that good for businesses and families alike?

*Dr. Tierney. Absolutely. I apologize for stepping on your toes there. Yes. That will help reduce bills for consumers very broadly.

*Ms. Castor. Mr. Anderson, so if we can break up these interconnection roadblocks, boy, that could really create a lot of jobs. Will we have the workforce that we need among our utility workers to connect up these power projects to the

grid?

*Mr. Anderson. Thank you very much for that question. And just in case it is not immediately obvious, you have put your finger right on what our perspective there is. We don't have particularly strong opinions about the cautioning that's used such as the other witnesses do. We do have a strong opinion about -- is who is going to build these projects, who is going to operate them and maintain them over time. And naturally, we want those jobs to be as good as possible.

Do we have the workforce now? We have the start on the workforce. But when we are talking about the scale of buildout that we are discussing at this hearing today, we will need a much larger workforce, which is -- goes back to my earlier response to the chair, which was that we have to build out our training programs much more robustly than they exist now because the scale of the job requires a much -- a scaled-up workforce.

*Ms. Castor. And Mr. Clark, do you see -- I mean, these are projects all over the country. But from your experience, this would be a boon to middle America especially, but talk to me about where we could see these jobs.

*Mr. Clark. Sure. With regard to jobs, of course, wherever the projects are built, that's where the jobs will follow. And we have certainly seen that with certain transmission projects and things like that in my home region.

With regard to the interconnection queues, this is an issue that, when I think back, this was probably an issue in 2005 and '6.

When I was on a state commission, it was an issue while I was at FERC, and it has been an issue since then. So it is a log jam. I do have some concerns with regard to the suggestion that if we just spread the costs around large enough, that will break up the interconnection queue itself. The reason for that concern is it may just encourage more developers to then clog the queue, which in one hand is sort of -- I see more development happening out there. On the other hand, it attracts that much more interconnections into the queue. So it --

*Ms. Castor. We are off --

*Mr. Clark. I wish --

*Ms. Castor. -- our competition aren't --

*Mr. Clark. Yeah. I wish there was a silver bullet to the interconnection problem, but we haven't come up with one yet at the -- at the regulatory level. It is tough because you do have to do the engineering studies, of course, to make sure that everyone can interconnect equitably in a way that doesn't harm the reliability of the system.

*Ms. Castor. Thank you very much. I yield back.

*Mr. Rush. The gentlelady yields back. The chair now recognizes the gentleman from Indiana, Mr. Bucshon, for five

minutes.

*Mr. Bucshon. Thank you, Mr. Chairman. On the first panel, I mentioned a couple of ongoing challenges to infrastructure development, including probably new transmission lines, lawsuits related to eminent domain issues and environmental activists who sue over basically anything.

So Mr. Clark, what do you see as the biggest challenges when it comes to building out transmission infrastructure, particularly the stuff that is discussed in the bill about - in this bill where we would build out charging stations across the country. What is the biggest challenges that we face to actually completing a timeline that is described in this bill?

*Mr. Clark. Congressman, I think that probably permitting challenges are the largest challenge that we have across the country. And I do have concerns that simply shifting the responsibility for siting lines to the federal government doesn't really solve that problem. In fact, in some ways, it may --

*Mr. Bucshon. Probably will make it worse; right?

*Mr. Clark. In some ways, it could. If you set up a system where there had to be programmatic EIS's and the federal government itself was planning transmission corridors and lines, you will invite a significant amount of opposition

to those projects. And as my friend, Congressman Armstrong pointed out earlier, all of the folks who have been watching what has been happening in the pipeline permitting program and finding out new legal ways to block those lines have been sharpening their pencils. And those legal strategies will be used against electric transmission lines as well.

*Mr. Bucshon. Yeah. For example, the Supreme Court ruled today against the state of New Jersey blocking a pipeline based on eminent domain across state property, but that doesn't -- it is a pipeline going up the East Coast, our chairman's home state.

But that doesn't fix the problem there. So there is going to be ongoing lawsuits in addition to -- no matter what we -- what we do. I would agree that, in my experience, taking jurisdiction away from states and giving it to the federal government makes things dramatically worse. I think that's been proven over and over. So basically, do you feel like the goals of 2035 and 2050 realistically be met when the legislation doesn't address what you said, the permitting process? I mean, how -- I mean, that's the -- all of us on this committee want to address carbon emissions.

I think most of us support -- I -- at least I'll speak for myself. I support an all-of-the-above energy approach. But that said, how can we have a timeline this tight 14 years from now if we don't address the permitting process? I mean

-- and I think Mr. Armstrong mentioned in some infrastructure of a highway in his state. And he mentioned maybe six or seven federal agencies that had jurisdiction that had to -- had to go through that process. And every one of them, if something is different between your permit over here and over here, they get sued.

So if we don't address that process and streamline that at the federal level and then we take control at the federal level, how can we meet these timelines? Is there any possible way?

*Mr. Clark. Congressman, to your question, even under the best of circumstances if you -- you know, it is 2021/2035 goal. In the utility business, 14 years is basically tomorrow.

*Mr. Bucshon. There you go.

*Mr. Clark. And to meet extraordinarily aggressive goals on that sort of timeline, considering that there would have to be a tremendous buildout of infrastructure that already is very difficult to get built in and of itself. And we heard testimony today, and we have heard it elsewhere. If you are a major transmission project crossing federal land, 15 years might be an optimistic scenario to get one line built, let alone talking about an entire grid transformation.

*Mr. Bucshon. Yeah. So we have seen difficulties maintaining our existing transmission lines in California.

Obviously, you know, we have wildfire situations out there a lot, and some of that is related to -- honestly, I think the environmental community not allowing us to clear trees and other things away from transmission lines, that is local and federal but mostly, I think, California issues.

Does this legislation address that kind of thing?

*Mr. Clark. Congressman, I have to admit I haven't read the whole almost 1,000-page bill, and I --

*Mr. Bucshon. Yeah.

*Mr. Clark. -- focused more on --

*Mr. Bucshon. Neither have I.

*Mr. Clark. -- that I am testifying on. But I think under any scenario, the point that you are getting at is a good one, which is that the grid transformation, which I think the arc of is very clear. We are moving towards a less carbon-intensive grid.

*Mr. Bucshon. And I agree with that. I think everyone does.

*Mr. Clark. The -- getting there is tough. There is no two ways about it.

*Mr. Bucshon. Yeah. I yield back.

Thank you for those answers.

I yield back, Mr. Chairman.

*Mr. Rush. The gentleman yields back. The chair now recognizes the gentlelady from California, Ms. Barragan, for

five minutes.

*Ms. Barragan. Thank you, Mr. Chairman, and thanks to the panel for joining us today. Mr. Gramlich, will building a national grid help our country retire fossil fuel plants more quickly?

*Mr. Gramlich. Well, I think we need a large investment in interregional transmission under any scenario for resilience. Certainly, it is the case sometimes when plants retire, as Dr. Tierney mentioned, that there are sometimes plants that are right next to disadvantaged communities that have the local emissions, and you need transmission to replace those and clean up the air. So in that respect, yes.

*Ms. Barragan. Okay. So just to be clear, you do think it is going to help us to retire them more quickly or you don't?

*Mr. Gramlich. Well, transmission is critical to cleaning up the grid no question. Cleaning up the grid and for system resilience.

*Ms. Barragan. Okay. Dr. Tierney, on average, will the clean energy sources -- will the clean energy sources national grid -- hang on a quick second. Oh, my note is -- I think I have, when I drafted this, a little typo here. I think I am just going to ask Mr. Anderson my next question, and I will come back to that.

Mr. Anderson, how can we target grid investment so the

jobs they create can benefit workers and communities of color?

*Mr. Anderson. That's a great question. I think it goes back to a couple of points that I made earlier, which is -- well, it is tied up with all the points we have made earlier today.

Targeting the investment in a way that allows the regulated utilities to be a part of this is what will really benefit the workforce because that is where the unionized workforce really is. And that goes to the point that has been made several times today about projects first having local, state and utility buy-in as opposed to being a top down federal approach.

A happy byproduct of doing that bottom-up approach is that you are organically including the unionized workforce in doing that. To your second question about the community, it is really, I think, about, I'll say, revenue flow.

And the reason I say that is because even if you locate a brand-new generation asset of any type -- say it's a utility-scale solar farm, another thing that has been said today is that nobody really likes utility projects no matter what they are. And the reason is because nobody likes to look at them, frankly, and it doesn't matter really what it is. So the way that you benefit the community is you site these assets for engineering reasons or where the resource is

and then think about where the revenue from that generation asset flows and identify the community that needs to be -- that needs benefit.

*Ms. Barragan. Okay. Thank you. Mr. Anderson, I was going to stay and follow up with you on that. Like any other work, green jobs aren't guaranteed to be good jobs. As Congress looks to invest in the grid, what labor standards should we be requiring of any companies that receive investment tax credits or other federal funds?

*Mr. Anderson. Thank you for that question. That is very important. I think the first top-line thing that Congress could do, frankly, is some fundamental reform of federal labor law by which I mean passing the PRO Act and having that signed into law. Federal labor law at this point is degraded to a point where it is very difficult to use. I will say that. And -- but the second point there on labor standards, particularly when it comes to things like Buy America and procurement standards, it is also very critical to say if you are going to get the bid on this project, then these are the labor standards that you have to meet now.

That doesn't -- you can't actually mandate union labor. I understand that. But you do -- you can build out a set of labor standards in such a way that that's probably where it is going to come from because that is where the really good jobs are, is in that unionized workforce.

*Ms. Barragan. Great. Well, thank you.

Dr. Tierney, I will have to follow up with you on my own. It is a question about whether, you know, this clean energy having a national grid is going to make it cheaper for the ratepayers compared to what they are currently paying. I don't know if you want to comment on that in my last 20 seconds at all. I am happy to yield you that 20 seconds or we can chat offline.

*Dr. Tierney. Well, just one thing I can say is that what transmission can provide is the ability for the grid operator to reach out to more economical supplies. So, yes, there could clearly be benefits to consumers. But I would be happy to answer that more fully. Thank you.

*Ms. Barragan. Okay. Thank you. I apologize for the mix-up. With that, Mr. Chairman, I yield back.

*Mr. Rush. The gentlelady yields back. The chair now recognizes the gentleman from Michigan, Mr. Walberg, for five minutes.

*Mr. Walberg. Thank you, Mr. Chairman, and thanks to the panel for being here to take our questions and respond today. Mr. Clark, in your testimony, you discussed respecting regional differences. I appreciate that. You said there is no one-size-fits-all when it comes to generating and transmitting electricity in the United States and that different market structures have developed based on

characteristics of each reason. It makes sense to me. The point hits home very clearly in the state of Michigan.

Our energy system is unique in that the utilities own and operate generation assets and the distribution system while an independent company owns and operates the transmission system. This structure creates some challenges for us since the state public utility commission overseas generation, but our transmission lines fall under FERC. All that to say -- point out that every state, every region, is unique and have unique challenges specific to them.

As opposed to only investing in new transmission lines, some states might refer non-transmission alternatives that achieve the same result in terms of reducing emissions. For instance, Michigan is one of the top three states that stand to benefit the most from deploying carbon capture technologies at existing steel and cement industrial facilities, both in terms of reducing emissions and adding economic benefit like creating thousands of new good-paying jobs.

And so Mr. Clark, can you speak to the potential harm that a top-down one-size-fits-all approach to building out massive amounts of new transmission might cause to a state like Michigan?

*Mr. Clark. Congressman Walberg, thank you for the question. I think what you had mentioned in your question

about some of the things that are going on, it sounds like at the -- sort of the distribution side and at the retail side is a good case in point. And why I say that, it really has to take place from the bottom up and not the top down.

So many of the non-transmission alternatives, things that might include demand response or energy efficiency programs, other things that take place on a customer precedent -- premises are things that, by definition under federal law, because of the line that is drawn in the Federal Power Act itself are retail activities and, therefore, subject to state jurisdiction. So states have the most experience in that. And they tend -- they, in overseeing their utility companies, will build a resource base and make decisions and balance interest based on how to best serve those customers from the bottom up.

If the federal government doesn't take that into account and we are empowered to, as I suggested, just simply draw lines that may hook up what looks like a renewable rich area here to a load center here, it could actually disrupt a lot of those investments that take place in the region, whereas if the planning takes place from the bottom up, then that sort of transmission line might be supported by a broad region because it is supporting the individual choices that those states are making.

*Mr. Walberg. You have a great deal of experience

dealing with the thorny issues related to allocating costs for interstate transmission projects. You state in your testimony that, and I quote, transmission and generation projects exist to support customers, again going from the bottom up, as you have said.

Customers don't exist to support transmission and generation projects. Do you believe we should more carefully examine how this proposed massive transmission buildout purported to be about a hundred billion dollars will affect consumer cost? A utility in my state has suggested that if this were to take place, it would cost the ratepayer a 20 percent increase. Would you recommend doing so state-by-state or region-by-region?

*Mr. Clark. So cost allocation is one of the most difficult challenges that FERC deals with, and it is because beneficiaries can change over time over the grid, and they are often very contested cases. And that suite of MISO lines that we had talked about earlier, Michigan was actually a state that -- that I think it was Michigan and Illinois had sued in federal court over those cost allocation decisions. So these are big-dollar values.

I actually think FERC has a lot of tools to be able to come up with smart cost allocation decisions under current law. So I might be a little bit concerned about broadening federal law in ways that upset that precedent that has been

established to this point.

*Mr. Walberg. Well, I would as well, especially when we think about the cost of mandates to the consumers and the impact that would be unique -- in each unique region of this country. So I appreciate your comments, and I yield back.

*Mr. Rush. The gentleman yields back. The chair now recognizes Mr. Palmer of Alabama for five minutes.

*Mr. Palmer. Thank you, Mr. Chairman. Earlier in this panel, one of my colleagues said that these transmission lines and renewable would be competitive, that cost would come down, that -- Mr. Clark, that would only be -- that statement can only be made in the context of the massive amount of federal subsidies that go to solar and wind. I have got a report here that came out in April of this year. Shows the subsidies for wind at almost $34 billion and the subsidies for solar at almost 27 billion. That is almost three times the combined subsidies for expensing of expiration costs for oil and natural gas and for the depletion allowance for oil and natural gas.

Would -- given the -- that the taxpayers are basically having to foot the bill for this, that is not exactly a reduction in cost, is it?

*Mr. Clark. So Congressman, I mean, one of the -- there have been a number of studies recently that would indicate that even without the subsidies, a lot of renewables are

becoming competitive, which would seem to indicate that perhaps you don't need the subsidies to continue to promote the renewables. I think originally those subsidies were intended as sort of a jumpstart to that industry, and there was an expectation that most of those would be phased out, but they have been extended several times.

They can have distortive impacts on the market. It is something that Congress will want to be aware of. But as I indicated earlier, utilities will build resources for different reasons. Renewables can be a very competitive option when it comes to things like --

*Mr. Palmer. Let me just point out, having worked for a couple of engineering companies, a lot of the cost of this will be in the form of stranded costs. And it is going to be enormously expensive to completely replace the power grid. I mean, we are talking trillions of dollars to have one uniform grid. And that cost is going to be borne either by the taxpayer or the ratepayer or both.

It will be borne by the people who are doing manufacturing, operating businesses. As I point out to people, businesses don't pay regulatory costs. They don't pay taxes. Consumers do. So any way you look at it, in the long-term, this is going to be extremely expensive, as was the current grid, as they are still paying for the stranded cost. I also want to raise another issue that several of my

colleagues have raised that I'm -- I'm not sure that my Democrat colleagues have adequately addressed. And that is the issue of the power of eminent domain. Section 216 of the Federal Power Act authorizes the Federal Energy Regulatory Commission to issue a federal permit that preempts state limits and grant permit holders eminent domain authority. If the -- is it possible that the permit holder could be a private company?

*Mr. Clark. Oh. Yes, Congressman.

*Mr. Palmer. So we would be granting a private company eminent domain authority over --

*Mr. Clark. That is --

*Mr. Palmer. -- property owners.

*Mr. Clark. That is correct. It would greatly expand the -- what is now an unused federal backstop authority and what, in my testimony, I called really just federal siting authority.

*Mr. Palmer. Well, that is very disturbing to me. And I pointed out on the earlier panel the number of states that have fought these -- the expansion of these transmission lines over state property, over private property. One of my colleagues on the Republican side quoted the chairman of this committee, Frank Pallone, and his arguments against the pipeline being forced -- construction pipeline being forced on his home state of New Jersey. I respect the chairman's

position on that, his -- he is absolutely right to defend his state's property rights, both the state property and the private property owners.

You know, I find it striking that the federal government has -- has declared certain species endangered like the lesser prairie chicken that they are about to put on the endangered species list that will impact what is going on in the Permian Basin. But -- and I don't want to make light of this, but it is almost as though they give more power, more rights to the lesser prairie chicken than they do a homeowner or a farm owner or ranch owner or a municipality. And that is disturbing to me. So I hope that, as we go forward, Mr. Gramlich, and others on this panel that you realize that you are trampling on constitutional rights, and there is nothing in our Constitution that I think people hold as dear as they do their right to private property. I yield back.

*Mr. Rush. The gentleman yields back. The chair now recognizes the gentlelady from Arizona, Ms. Lesko, for five minutes.

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

Mr. Clark, I have several questions for you. The first is would you say it is safe to say that if there is a mandatory provision that utility companies have to be part of an RTO or ISO, as is stated in the Democrats' bill that Arizona would probably be brought into the California ISO.

*Mr. Clark. So there are not a lot of -- lot of other ISOs operating in the West. The only one that is near Arizona right now is Cal ISO. So it could be a likely candidate if it was mandated upon Arizona.

*Mrs. Lesko. And so what would happen, in your estimation, if Arizona is brought into the California ISO under that authority? My understanding is the governor of California appoints the board members to the California ISO. So would that mean basically that Arizona would be governed by the governor of California?

*Mr. Clark. One of the hurdles to developing an ISO in the West, quite candidly, has been that governance structure of the Cal ISO because it is appointed by the governor of California. California has such a large state in comparison to others in the West. And it has very aggressive energy policies. It has traditionally been a concern of other Western states that they don't wish to come into an ISO that has that level of sort of a political thumbprint on it. So that is a big concern for leaders across the West, yes.

*Mrs. Lesko. Thank you. And Mr. Clark, would you say -- will forcing Western utilities into RTOs result in more renewable energy on the grid?

*Mr. Clark. I don't believe necessarily that's case -- the case. I think there are -- and part of the reason I say that is -- is ISOs in and of themselves were not designed to

choose a particular resource. They were designed to operate around setting price as the mechanism that determines, say, when transmission gets built or what resources come online, what resources are dispatched.

So RTOs aren't specifically designed to be transmission and green energy-building machines. I think there may be ways for the West or for other regions to achieve significant carbon reductions and a buildout in renewables but in a planned way. One of the ways that the utilities in the West have been -- have been doing that is through membership in what we had heard about earlier, the EIM, energy imbalance market, where they maintain their fleet of generation to serve their customers, but then they have a platform that rests on top of that state-regulated activity that allows them to trade more energy across a broader region.

*Mrs. Lesko. Thank you. And you talked about this before. But in Section 220 of the Democrats' bill, it says it disallows state interference and a customer's right to purchase clean electricity in interstate commerce. And I believe your concern and my concern as well is that big electric buyers like data centers or Google, Amazon would then be able to do that. And the fixed cost of utilities would then be spread to the residential customers, thus increasing their cost. Is that -- am I accurate on that?

*Mr. Clark. Congresswoman, that is -- that would be my

concern. And that is why the -- typically states have processes for when, for example, a large buyer wishes to directly procure their energy from some other resource that there is a mechanism that they will go through to ensure that other customers are held harmless. I worry about putting a, quote/unquote, right to clean energy mandate in federal law that may preempt a lot of those consumer protection standards.

*Mrs. Lesko. Thank you, Mr. Clark. And my last question is also in Section 220. It basically says FERC can charge carbon taxes on people. Is that your understanding, and would the utility rates rise for consumers in that case?

*Mr. Clark. So as I read that section, yes, it would allow a pathway to make it clear -- explicitly clear that it is legal for FERC to start a process by which it would price carbon into, if the bill is passed as it is, now mandatory RTOs which would establish effectively the nationwide price on carbon. That will have the effect of raising consumer rates, almost by definition, because it is changing the dispatch stack from what would normally run to resources based on an environmental dispatch.

*Mrs. Lesko. Thank you, Mr. Clark, for your testimony, and you, sir, as well, and Ms. [sic] Anderson. And I yield back.

*Mr. Rush. The gentlelady yields back. The chair now

recognizes the gentleman from Indiana, Mr. Pence, for five minutes.

*Mr. Pence. Thank you, Chairman Rush, Ranking Member Upton, and thank you to the panel for coming here today. Mr. Gramlich, I just got here at the end. I kind of feel sorry for you. Nobody is asking any questions. And I am not going to either. Sorry.

You know, the rapid rush to green envisioned by the CLEAN Future Act would outpace current technologies who move beyond the logistical reality permitting large-scale infrastructure projects. The Princeton report on transmission that has been referenced here today suggests a 31 percent increase in national capacity by 2025, three and a-half years away from right now.

We know that from design to completion, these types of infrastructure projects can take over 10 years and sometimes even longer. To be clear, I support efforts to modernize our grid and to reduce our emissions. Hoosiers in southeast Indiana will benefit from transmission technologies that make more efficient use of energy supplies.

It is important to note that stakeholders in Indiana and cross-country are already investing in transmission projects to make this a reality. Instead of a top-down approach that many of us have talked about today, we should encourage the private investment that is already occurring by lowering

barriers to continued innovation. Take the Indiana Municipal Power Agency, for example. IMPA has worked with their members to responsibly integrate a hundred gigawatts of renewable energy into the grid all without sacrificing reliability or affordability. And you spooked me with the FERC carbon tax, Mr. Clark.

Unfortunately, that is not how CLEAN Future Act views his transition. Starting with the timeline set out under the clean energy standards and tied together with the national policy on transmission, utilities and public power agencies will be forced into cost-prohibitive investments that may or may not fit local needs of their ratepayers. Further, this bill will put all ratepayers on the hook for expanded electrical vehicle network envisioned by my colleagues, which doesn't really fit my rural area.

Who will pay for the transmission needed to obtain and distribute dispatchable energy for electric vehicle charging equipment? This bill will spread the cause amongst all ratepayers, not just EV drivers, to subsidize retail infrastructure. And I mentioned earlier in the first panel I know a lot about retail infrastructure. I have dealt with some folks in Europe about their implementation of putting charging stations in. And it is not just a transmission to the site. It is very, very costly. In some cases, it costs a million dollars to be able to distribute it at the site.

Commissioner Clark -- and again, sorry, Mr. Gramlich -- across the country, leading utilities and public power agencies are already investing in transmission upgrades to provide more efficient energy distribution and to integrate more renewables into the grid. But provisions in the CLEAN Future Act disregard the regional expertise of our local authorities and stakeholders. What do you envision happening to local utilities privately owned, municipally owned, in my district that would be forced to integrate renewables into the grid before they are able to sufficiently maintain supply in a cost-effective manner?

*Mr. Clark. Congressman, thank you for the question. I think it really does -- not to sound a bit like a broken record here today, but it does emphasize the importance of the bottom-up planning. And if you can do that, there is certainly lots of situations in which the local utilities will see that there may need -- be a need for a transmission line, maybe fairly large regional -- interregional lines. But it has to be based from a bottom-up analysis of what they need and not a presumption that there is one particular way that their customers should be served. If that happens, then, yes, it does have the potential of undercutting investments that they may have made locally that might then compete with lines that are brought in and against resources that are brought in that have a comparative advantage because

of the, perhaps, socialized nature of the cost allocation.

*Mr. Pence. I like that, socialized nature of the cost. But -- well, thank you all for being here today, and I yield back.

*Mr. Rush. The gentleman yields back, and that concludes the witness questioning, and I would like to thank our witnesses for their participation in today's hearing. I must add in your testimony, your answers to some very tough questions was nothing less than remarkable and very, very informative.

And I want to remind members that pursuant to committee rules, they have 10 business days to submit additional questions for the record to be answered by the witnesses who have appeared. I ask each witness to respond promptly to any such question that you may receive. Before we adjourn, I request unanimous consent to enter the following letters and documents into the record: a June 18th -- a June 28th, '21 letter from the Industrial Energy Consumers of America on the CLEAN Future Act and electric transmission; a June '21 letter -- or scratch that -- a June '21 report from the Americans for a Clean Energy Grid; a June 24, '21 -- 2021 letter from the R Street Institute on the Electric Transmission Reform; a June '21 -- 20 -- June 2021 white paper from Staten Island Management Consulting on the environment transmission in the United States; a June 25th, 2021, letter from the Trade

Organization of American Power on power-free electricity by 2035; and lastly Chamber One from a CRS report on nuclear energy about commercial reactor shutdowns. Without objection, so ordered.

[The information follows:]

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

*Mr. Rush. That said, at this time, again, thank you, you very special witnesses, and the subcommittee now stands adjourned.

[Whereupon, at 5:08 p.m., the subcommittee was adjourned.]