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POWERING UP CLEAN ENERGY: INVESTMENTS TO MODERNIZE AND EXPAND THE ELECTRIC GRID

HEARING

BEFORE THE

SELECT COMMITTEE ON THE CLIMATE CRISIS HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTEENTH CONGRESS

FIRST SESSION

HEARING HELD
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POWERING UP CLEAN ENERGY: INVESTMENTS TO MODERNIZE AND EXPAND THE ELECTRIC GRID

THURSDAY, MAY 20, 2021

U.S. HOUSE OF REPRESENTATIVES,
SELECT COMMITTEE ON THE CLIMATE CRISIS,
Washington, DC.

The committee met, pursuant to call, at 9:30 a.m., via Zoom, Hon. Kathy Castor [chairwoman of the committee] presiding.

Present: Representatives Castor, Bonamici, Brownley, Huffman, Levin, Casten, Graves, Palmer, Carter, Miller, Armstrong, Crenshaw, and Gonzalez.

Ms. CASTOR. The committee will come to order.

Without objection, the chair is authorized to declare a recess of the committee at any time.

As a reminder, members participating in a hearing remotely should be visible on camera throughout the meeting.

As with in-person meetings, members are responsible for controlling their own microphones. And members can be muted by staff only to avoid inadvertent background noise.

In addition, statements, documents, or motions must be submitted to the electronic repository to sccc.repository@mail.house.gov.

Finally, members or witnesses experiencing technical problems should inform the committee staff immediately.

Well, good morning, everyone, and thank you all for joining this remote hearing. Today we are looking at the benefits for our country and workers that come from modernizing and expanding the electric grid.

I now recognize myself for 5 minutes for an opening statement.

Well, we started this Congress with hearings focused on the millions of jobs we can create in clean energy and resilience and then the growing risks and costs of inaction. Once again this week, we are seeing how extreme climate-fueled events harm Americans across the country and put lives at risk. Rising temperatures and the climate crisis are amplifying these impacts.

Heavy rains and flooding in Texas, Louisiana, Oklahoma, and Arkansas have left homes, businesses, and entire communities under water. Over the weekend, more than 1,000 people in southern California were forced to evacuate their homes when a wildfire broke out in the Santa Monica mountains.

Current drought conditions and a wildfire in the middle of May have already heightened fears of another long and brutal fire sea-

son on the West Coast, and our hearts go out to the families dealing with these disasters.

And, Ranking Member Graves, our thoughts are with you and your constituents in the Baton Rouge area especially.

Our efforts here in Congress must focus on solutions to help them, not only in the near term, but also the long term, to avoid the catastrophic climate consequences for our grandchildren—our children and our grandchildren. One of those important solutions is to modernize and expand the electric grid, making it stronger and more resilient.

Wildfires out West and cold snaps in the South have left Americans in the dark and in danger just in the last 4 months. And climate-fueled disasters continue to hit our energy infrastructure, which is already in need of major repairs.

Nationwide, the American Society of Civil Engineers gives American energy infrastructure a C-minus rating. We don't want a C-minus. We are America. This is America. We can do better than that. And when we do, hopefully together, we will create a lot of jobs and mend our supply chains through Buy American.

Building a modern grid can increase our energy capabilities and improve efficiency across America, all while ensuring greater reliability. The energy catastrophe in Texas demonstrated the need for safeguarding the Nation's disconnected grids with better backup and interconnections.

We have many innovations at the ready. We just need to deploy them. This also will create good-paying jobs that will help jump-start the economy. According to a recent report from Americans for a Clean Energy Grid, there are already almost two dozen shovel-ready projects that will reduce connection, improve reliability, and put over 1 million Americans to work. Another report by the American Council on Renewable Energy shows that an investment tax credit for priority high-voltage transmission lines would lead to about 650,000 new jobs.

Both reports show that investing in our grid will create jobs. That is why renewing and modernizing the grid is the centerpiece of President Biden's American Jobs Plan. By passing the President's infrastructure plan, we can put thousands—hundreds of thousands—of people to work, laying thousands of miles of transmission lines that will connect entire regions across America. It is a historic investment and a once-in-a-generation opportunity to invest in America so we come back stronger.

We already have the innovative technologies needed to increase the efficiency, capacity, and flexibility of our electric grid, and the experts here today will help explain how. We know we need to act quickly. As we expand clean energy, we will also reduce pollution and lower electricity bills and will build new transmission lines so that every city, town, and county can access America's affordable and abundant wind and solar energy.

We must set ambitious goals via a clean energy and an energy-efficiency standard. Many States are way ahead of us on this, and we need to catch up. Cleaning up the power sector will also help us reduce carbon pollution from the transportation, building, and industrial sectors. Many automakers have already announced their commitment to electric vehicles, and I loved watching President

Biden this week take a drive in the new Ford F–150 in Michigan, where he previewed the new electric pickup truck and renewed his commitment to the nationwide charging network.

This is how we solve the climate crisis, by unleashing American innovation and building the cars of tomorrow in America.

Today's witnesses will give us important insights on the road ahead of us as we double down on clean energy in a way that prioritizes workers and environmental justice. I look forward to our conversation.

At this time, I will recognize Ranking Member Garret Graves for a 5-minute opening statement.

[The statement of Ms. Castor follows:]

Opening Statement of Chair Kathy Castor

Hearing on "Powering Up Clean Energy: Investments to Modernize and Expand the Electric Grid"

Select Committee on the Climate Crisis

May 20, 2021

As Prepared for Delivery

We started this Congress with hearings focused on the millions of jobs we can create in clean energy and resilience, and the growing risks and costs of doing nothing. Once again this week, we are seeing how extreme, climate-fueled events harm Americans across the country and put lives at risk. Rising temperatures and the climate crisis are amplifying these impacts.

Heavy rains and flooding in Texas, Louisiana, Oklahoma, and Arkansas have left homes, businesses, and entire communities underwater. Over the weekend, more than a thousand people in Southern California were forced to evacuate their homes, when a wildfire broke out in the Santa Monica mountains. Current drought conditions—and a wildfire in the middle of May—have already heightened fears of another long and brutal fire season on the West Coast. Our hearts go out to the families dealing with these disasters. And our efforts here in Congress must focus on solutions to help them, not only in the near-term, but also to avoid catastrophic climate consequences for our children and grandchildren.

One of those important solutions is to modernize and expand the electric grid, making it stronger and more resilient. Wildfires out west and cold snaps in the South have left Americans in the dark and in danger just in the last 4 months. Climate-fueled disasters continue to hit our energy infrastructure, which is already in need of major repairs. Nationwide, the American Society of Civil Engineers gives American energy infrastructure a C-minus rating. We don't want a C-minus. This is America, and we can do so much better. And when we do it, hopefully together, we will create a lot of jobs, and mend our supply chains with Buy American.

Building a modern grid can increase our energy capabilities and improve efficiency across America, all while ensuring greater reliability. The energy catastrophe in Texas demonstrated the need for safeguarding the nation's disconnected grids with better backup and interconnections. We have many innovations at the ready, but need to deploy them—and this also can create good-paying jobs that will jumpstart our economy. According to a recent report from Americans for a Clean Energy Grid, there are already almost two dozen shovel-ready projects that will reduce congestion, improve reliability, and put over a million Americans to work. Another report—by the American Council on Renewable Energy—shows that an Investment Tax Credit for priority high-voltage transmission lines would lead to 650,000 new jobs.

Both reports show that investing in our grid will create jobs across America. That's why renewing and modernizing the grid is a centerpiece of President Biden's American Jobs Plan. By passing the President's infrastructure plan, we can put hundreds of thousands of people to work laying thousands of miles of transmission lines that will connect entire regions of our nation. It is a historic investment—and a once-in-a-generation opportunity to invest in America so we're come back stronger.

We already have the innovative technologies needed to increase the efficiency, capacity, and flexibility of our electric grid. The experts here today will highlight how, and we know we need to move quickly. As we expand clean energy, we'll also reduce pollution and lower electricity bills. And we'll build new transmission lines so that

every city, town, and county can access America's affordable and abundant wind and solar energy. We must set ambitious goals via clean energy and energy efficiency standards. Many states are way ahead on this and we need to catch up.

Cleaning up the power sector will also help us reduce carbon pollution from the transportation, buildings, and industrial sectors. Many automakers have already announced their commitment to electric vehicles. I loved watching President Biden drive the new Ford F–150 in Michigan, where he previewed the new electric pick-up truck and renewed his commitment to a nationwide charging network. This is how we solve the climate crisis—by unleashing American innovation and building the cars of tomorrow in America.

Today's witnesses will give us important insights on the road ahead of us, as we double down on clean energy in a way that prioritizes workers and environmental justice. I look forward to our conversation.

Mr. GRAVES. Thank you, Madam Chair.

And I do appreciate your recognition of some of the extraordinary challenges our folks are going through back at home. We recently had a storm this week where we got about 12 inches of rain in about 8 hours. In fact, I think there was 1 hour of time where we received about 4 inches of rain. So pretty incredible. I think my quick math was within about 8 to 12 hours, our folks at home received as much rain as the average American does in—40 percent of the average rainfall in a year's time for the average American. So pretty incredible.

But, in any case, I want to thank you for having this hearing. And, Madam Chair, as you know, every once in a while we don't agree, but in this case, in terms of updating our grid, I think this is an area where we absolutely share the same objectives. We have seen blackouts and brownouts all across the United States, and part of that is attributable to some of the grid issues. We also, I believe, have cyber vulnerabilities to much of our grid that needs to be addressed as we work to update the grid system. And so I want to reiterate that I think that we share that objective.

As a matter of fact, in Ms. Sanford's testimony, she makes reference to a Princeton study that concludes that our grid capacity in terms of high-voltage transmission is going to need to triple between now and approximately 2050. Let me say that again. The capacity of high-voltage transmission in our grid, according to a Princeton analysis, indicates that it is going have to triple in capacity between now and 2050. And so that is very different than the status quo.

Madam Chair, this administration has talked a lot about infrastructure. And I, once again, I share their concern for infrastructure. I think, like, roads, bridges, flood protection, I think that our ports, waterways, and airports are all Federal obligations, Federal responsibilities. They are part of the core infrastructure that the Federal Government has an obligation to work on. But my large concern with what this administration is trying to do is that putting an extraordinary amount of taxpayer dollars into a system that is incapable of delivering only results in more bad outcomes. And let me clarify what I am talking about there.

You have heard, for example, that the average road project now takes 7 years just to get through an environmental review. I have no desire, and I am confident no one on this committee has any desire, to go trash the environment. But if we have, I believe, tripled the amount of time it takes to do an environmental review from when this law was first passed, we have got to take a fresh look

at that. Let me say it again. Not to shortcut our review of the environmental impacts but to make sure that we are staying focused on the core objectives of that law, making sure that we are truly focused on the best environmental outcomes, but also staying focused on the project outcomes, the project objectives, because the worst kind of project in the world is a project that never gets finished.

Madam Chair, as you know, I have spent from my teenage life on involved in infrastructure. And it is so frustrating to work with the Federal Government. They are an unreliable Federal partner. And I think that if we are going to realize the grid transformation that is needed, we have to make fundamental changes to our permitting process, to the way that we develop and we deliver projects for grid reform or modernization, as well as other types of infrastructure projects.

And so I think that has got to be a very important, really, just a fundamental component of the recommendations we make moving forward on how to ensure that the preconstruction activities don't monopolize all of the funding all of the time to where we never see ultimately the outcomes that all Americans deserve.

Last thing, Madam Chair, I want to make reference to my strong concerns about, I think, some of the confusing energy policies that we are seeing pushed right now by this administration. Madam Chair, I am just totally baffled. Months ago, we saw President Biden being deemed a hero for shutting down the Keystone Pipeline. Yet months later, we saw terrorist and hacker labels applied to the folks that shut down the Colonial Pipeline. How is it that the President can be a hero for shutting down a pipeline, while others are considered terrorists or hackers for shutting down a pipeline that had profound impacts on the U.S. economy, on folks all across the eastern seaboard?

The same administration just—after years of just trashing the Trump administration and deeming them as being complicit in Russian activities, then just lifted sanctions to allow the Nord Stream pipeline to send Russian gas to our friends in Europe that has a higher emissions profile.

I am really struggling with what appears to be the hypocrisy here, and I think that we have got to step in and make sure that we are making the right decisions for the global environment, for our allies, and for a clean energy future that is based on America's resources.

Thank you. I yield back.

Ms. CASTOR. I thank the ranking member.

And I think everyone shares the concern over the Nord Stream pipeline. I know the Biden administration didn't change its opposition to that pipeline. But I think it does highlight the need for maybe a hearing in this committee on harmful pollution from frack gas and other fossil development, especially in the wake of the IEA's report this week that was a surprise to everyone about—not a surprise about the surge we needed in clean energy but that they recommend no new oil and gas development, no new fossil development. So we will be talking about that in the days ahead, I am certain.

Mr. GRAVES. Madam Chair, I would welcome that hearing. I would love to do one on Nord Stream 2 and also on CCS activity. So thank you. Count us in.

Ms. CASTOR. Without objection, members who wish to enter opening statements into the record will have 5 business days to do so.

Now I want to welcome our witnesses. We will hear from leaders in the electric power industry on how investments to modernize and expand transmission infrastructure can create jobs, integrate more renewable energy, boost grid reliability, and protect the public health.

Linda Apsey is the President and CEO of ITC Holdings Corp., which is the largest independent electricity transmission company in the United States. Based in Michigan, the company owns and operates high-voltage transmission infrastructure in Michigan, Iowa, Minnesota, Illinois, Missouri, Kansas, and Oklahoma, with plans underway to expand in Wisconsin.

Donnie Colston is the Director of the Utility Department at the International Brotherhood of Electrical Workers, IBEW. He helps locals with collective bargaining agreements, working conditions, safety-related work practices, and apprenticeship training. A utility lineman, Mr. Colston started his career in transmission and distribution construction before working as an electric troubleman.

Emily Sanford Fisher is the General Counsel, Corporate Secretary, and Senior Vice President for Clean Energy at the Edison Electric Institute, which represents investor-owned electric companies. Ms. Fisher manages EEI's litigation and legal affairs, and she oversees and coordinates strategic clean energy engagement across EEI and across the Federal Government.

And Michael Skelly is the Founder and President of Grid United. He is a renewable energy entrepreneur and pioneer in the U.S. wind industry, who currently leads an early-stage transmission development company. Mr. Skelly was previously Founder and President of Clean Line Energy, a company that successfully permitted some of the longest transmission lines in the United States over the last 50 years.

Without objection, the witnesses' written statements will be made part of the record.

With that, Ms. Apsey, you are now recognized for 5 minutes for your testimony. Welcome.

STATEMENTS OF MS. LINDA APSEY, PRESIDENT AND CHIEF EXECUTIVE OFFICER, ITC HOLDINGS CORP.; MR. DONNIE COLSTON, DIRECTOR, UTILITY DEPARTMENT, INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS; MS. EMILY SANFORD FISHER, GENERAL COUNSEL, CORPORATE SECRETARY & SVP, CLEAN ENERGY, EDISON ELECTRIC INSTITUTE; AND MR. MICHAEL SKELLY, FOUNDER AND CEO, GRID UNITED

STATEMENT OF LINDA APSEY

Ms. APSEY. Great. Good morning. And thank you, Chair Castor, Ranking Member Graves, and distinguished members of the Select Committee. I am Linda Apsey, President and Chief Executive Officer of ITC Holdings Corp., the Nation's largest independent electric

transmission company. Thank you for holding this hearing and for addressing the clean energy economy and the future of the electric transmission grid.

Our Nation's high-voltage transmission system holds the key to unlocking renewable energy potential in much the same way the interstate highway system provided a roadmap to economic prosperity in the middle of the 20th century. Like the construction of the interstate highways, transformative investments in the high-voltage grid will not simply just happen. It will require visionary leadership from Federal and state leaders, as well as cooperation among numerous stakeholders and the Nation's electric utilities that oversee the grid.

If we are successful, this transformation of the grid can drive significant economic, environmental, reliability, and resiliency benefits for this and future generations to come.

While recent years have seen some policy steps taken to encourage transmission investment, more needs to be done to address the three major hurdles to transmission development: planning, cost allocation, and siting. I will first focus on the significant benefits of transmission investment and then on Federal policies that can help spur a reliable and affordable low-carbon electric system.

Electric transmission infrastructure is a strategic asset that can provide economic benefits and accelerate clean energy adoption. Modernizing the electric grid presents a unique opportunity to create hundreds of thousands of jobs. It also can generate sustained, long-term, economywide benefits, while helping to address decarbonization goals. The World Resource Institute estimates that for every $1 invested in U.S. transmission infrastructure, it creates approximately $2.40 in economic benefits.

While transmission drives significant benefits, the regulations and regional planning process we currently have are insufficient to address the challenges we face. There is still much to be done at the Federal agency level to fix these processes and facilitate the necessary investment.

First, the Federal Energy Regulatory Commission can improve planning processes by requiring regions to recognize and count all of the benefits of the given transmission project. Today, we only reflect whether the project is a reliability or economic project in our planning studies. We would strongly recommend that FERC also require planning studies to include state clean energy standards and realistic estimates for electrification growth.

In addition, new cost allocation policies are required to provide for the expeditious integration of the significant amount of renewable energy projects waiting to be connected to the grid.

FERC should also repeal or modify unhelpful policies, like Order 1000, that have slowed regional transmission development and simply made it more complex. The introduction of so-called competition is not competition. It is nothing more than a regulated bureaucratic bidding process with little appreciable benefit to the consumer.

With President Biden's goal of decarbonizing the U.S. electricity sector by 2035, high-voltage transmission is taking center stage. The proposal for an investment tax credit for transmission could offer a valuable tool to stimulate large regional transmission

projects that would connect remote renewable resources to our population centers. A well-designed tax credit for transmission can lower costs for large projects and make it easier to achieve cost allocation agreements, which is a key hurdle to project approval and construction.

In short, we support the bipartisan goal of investing in the Nation's high-voltage electric transmission grid. We are prepared and stand ready to work with all stakeholders to meet the climate challenge and build a 21st century energy economy.

I thank you for the opportunity to testify before this committee, and I look forward to working together to invest in America's clean energy future.

[The statement of Ms. Apsey follows:]

Statement of Linda Apsey, President and CEO
ITC Holdings Corp.

U.S. House of Representatives

Select Committee on the Climate Crisis

"Powering Up Clean Energy:
Investments to Modernize and Expand the Electric Grid"

May 20, 2021

Thank you, Chair Castor, Ranking Member Graves, and distinguished members of the Select Committee, for inviting me to testify on the critical topic of modernizing and expanding the electric grid.

I am Linda Apsey, Chief Executive Officer of ITC Holdings Corp. (ITC). As the largest independent electricity transmission company in the country, ITC owns and operates electric transmission assets in Michigan, Iowa, Minnesota, Illinois, Missouri, Kansas and Oklahoma with a combined peak load of 26,000 megawatts along 16,000 circuit miles of transmission lines. Since we have no geographic constraints, ITC is also focused on new areas where significant transmission system improvements are needed. We are proud of our record of investing in the grid to improve resilience, lower costs, and provide access to affordable renewable resources for our customers.

Thank you for holding this hearing and for addressing the clean energy economy and the future of the grid. The Select Committee Staff Report and Action Plan offer a comprehensive menu of policy options designed to spur investment in grid infrastructure and large-scale renewable energy needed to decarbonize the electric system in an efficient and affordable manner that also will enhance resiliency and reliability. Many of these ideas are now carried forward in President Biden's American Jobs plan.

While recent years have seen some policy steps taken to encourage transmission investment, more needs to be done to address the three major hurdles to transmission development—planning, permitting, and cost allocation. I will first focus on the benefits of transmission investment and then on federal policies that can spur a reliable and affordable low-carbon electric system.

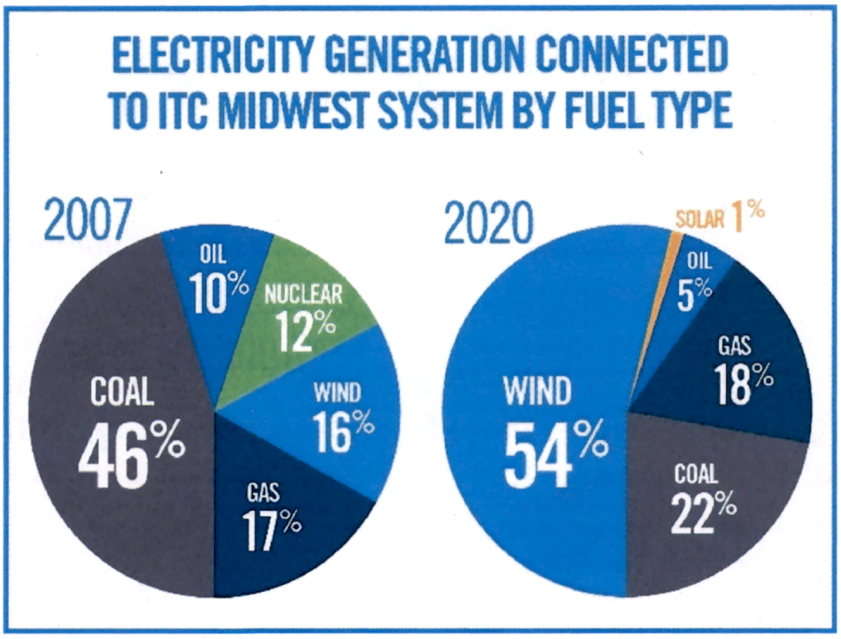
Transmission Investment Can Accelerate Clean Energy and Create Jobs

Our nation's high voltage transmission system holds the key to unlocking the renewable energy future, in much the same way the interstate highway system unlocked prosperity in the middle of the 20th century. Like interstate highways, transformative investments in the high voltage grid will not simply happen. Modernization and expansion of our electric grid will require visionary leadership from federal and state leaders, as well as cooperation among numerous stakeholders, including the nation's electric utilities. If we are successful, this transformation of the grid can drive significant economic and environmental benefits for this generation and the next.

Since our inception, ITC has played a critical role in the transformation of the generation fleet to cleaner and more sustainable generation sources. While we have done much—having already connected about 6800 megawatts of renewable capacity to the grid—much remains to be done.

Consider a few of the trends contributing to our changing energy landscape:

- Consumers, governments, corporations and other organizations pursuing sustainability goals are demanding clean energy.
- Traditional baseload generating plants are being retired at an unprecedented pace, as evidenced by this chart showing a significant shift in generating capacity connected to ITC Midwest's transmission system since 2007.



To meet the demands of customers and policymakers, utilities and renewable energy developers are adding wind and solar farms in Iowa and across the upper Midwest. MISO, the regional grid operator, reports more than 20 gigawatts of renewable energy—enough to power 14 million homes—is proposed in Iowa, Minnesota and western Wisconsin.

The need for major new transmission investments to support the future energy system will only grow. Our three largest customers announced significant generation transformation plans for the years ahead, and at least 30 utilities have made commitments to lower their emissions by 80% or more. Investing in transmission now will allow this transition to take place while maintaining affordability and enhancing system resilience.

The need for significant new investment in transmission to support clean energy and reduce emissions may sound daunting and expensive, but it does not need to be. A recent study from Americans for a Clean Energy Grid concludes that a "transmission-first" approach to clean energy deployment will save customers money compared to current electricity costs.[1] Transmission-first means planning and building transmission infrastructure and upgrading existing systems in areas ripe for developing abundant and cheap wind and solar generation. By contrast, the current practice of planning incremental additions to the system for each new generation source imposes significantly higher costs over the long run.

Returning to an earlier analogy, the interstate highway system was proactively built on a vision of future access and need. If it had been built the way transmission is today, based on incremental demand, we would not have nationwide highway infrastructure and millions would be denied access to its economic benefits. To unlock our energy future, we need to begin work today on a transmission system that prioritizes renewable resource development, anticipates growth, and expands access to reliable, low-carbon electricity for all.

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[1] Consumer, Employment, and Environmental Benefits of Electricity Transmission Expansion in the Eastern U.S. *https://cleanenergygrid.org/wp-content/uploads/2020/10/Consumer-Employment-and-Environmental-Benefits-of-Transmission-Expansion-in-the-Eastern-U.S..pdf*

In addition, investments in transmission can create and support thousands of jobs, both directly during construction and over the lifetime of the investments. According to a recent report on transmission benefits released by the WIRES Coalition and London Economics, job creation and economic benefits achieved through transmission development can be substantial and long-lasting.[2]

Transmission in Action: MISO Multi-Value Projects (MVPs)

There are many real-world examples of transmission development leading to increased penetration of low-cost renewables. For instance, ITC constructed major portions of MISO's Multi-Value Project portfolio in the Upper Midwest that were approved in 2011. These 17 high-voltage projects were designed to deliver renewable energy to load centers in the Midwest to facilitate compliance with state renewable energy standards and enhance grid reliability.

Retrospective analysis of these major projects confirms that they have led to significant renewable development, enhanced reliability and lower costs for customers. MISO affirmed the savings benefits from the MVPs in its most recent Triennial Review, issued in 2017.[3] That review indicated that the MVP portfolio will generate benefits in the range of $2.20 to $3.40 for each dollar spent. MISO estimates that the average electricity customer in the region will see $33 in annual benefits for a $12 per year investment in the entire MVP portfolio.

The final MVP Project underway is Cardinal-Hickory Creek and it will run from Dubuque, Iowa to Madison, Wisconsin. It will enable 42 generators in the upper Midwest to deliver 7,566 MW of low-cost, reliable wind and solar power in the region. During construction and installation, which will be done by union labor, the project will generate approximately 2,500 jobs and $274 million in economic impacts (GDP), according to the NREL's modeling. During operation, it will result in 135 permanent jobs and $17 million in annual economic impact.

As customer demand for low-cost clean energy increases, transmission lines like the Cardinal-Hickory Creek project will meet the need by providing consumers with access to electricity generated in renewable energy-rich areas of Iowa and Minnesota. With the right policies in place, this model of transmission development can be repeated in the Midwest and across the country.

Investments are Needed to Ensure Resilience and Grid Security

Reliability is always going to be an important issue for our nation as electricity is a key driver for our growth, prosperity, safety and security. This importance will only grow as electrification of the economy proceeds apace.

The threats faced by the system are both natural and man-made. The array and capabilities of hostile forces seeking to attack the U.S. electric grid and destabilize the nation have increased in size and sophistication over the past decade.

To date, ITC has invested approximately $9.8 billion in our 16,000 miles of transmission lines and about 670 substations to date. Significant ongoing, long-term investment is still needed in grid security to harden our systems against man-made and natural threats and address aging infrastructure, reliability needs, NERC criteria, and other infrastructure considerations.

Grid resilience means increasing our ability to anticipate, withstand, recover and adapt to a wide variety of dynamic and material risks to our electric systems.

ITC's systems serve Michigan, Iowa, Minnesota, Illinois, Missouri, Kansas and Oklahoma, with a combined peak load exceeding 26,000 megawatts (MW). These areas frequently experience blizzards, windstorms, flooding and other natural disasters. ITC has observed an increase in the frequency and severity of these and other extreme weather events, as well as their potential to disrupt the reliable delivery of energy to customers.

The widespread power outages caused by last summer's devastating derecho in Iowa—estimated by NOAA to cost more than $11 billion in damages—and the recent extended sub-freezing temperatures across much of the U.S., demonstrate the importance of a resilient and reliable electric power grid. Extreme weather events of an intensity comparable to the Midwest derecho in August 2020 can no longer be considered "black swan" or one-in-a-hundred-year events.

Consequently, continued investments in transmission are essential to ensure older transmission lines are rebuilt to provide greater system resiliency and reliability

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[2] Repowering America: Transmission investment for economic stimulus and climate change. *https://wiresgroup.com/repowering-america-transmission-investment-for-economic-stimulus-and-climate-change/*

[3] MTEP17 MVP Triennial Review. *https://cdn.misoenergy.org/MTEP17%20MVP%20Triennial%20Review%20Report117065.pdf*

during extreme weather events. At ITC, we are hardening our systems to provide greater redundancy to the entire grid, and keep power flowing to consumers during storms.

Investments are Needed to Realize Electrification

Automakers, states and corporate players have declared ambitious transportation electrification commitments—all with a focus on the decarbonization of transportation. For example, General Motors announced on January 28, 2021, that it plans to phase out gas and electric vehicles and offer an all-electric lineup by 2035.

A study for WIRES conducted by the Brattle Group indicates the investment in transmission in the U.S. must rise from $15 billion annually today to as much as $40 billion per year between 2031 and 2050 to meet this electrification challenge.[4] Other studies (Princeton, E3, NREL) have indicated that the transmission system will need to double or even triple in size if we are to electrify the economy.

Federal Policy and Transmission Investment

High-voltage transmission is essential both to meeting President Biden's goal of decarbonizing the U.S. electricity sector by 2035 and to reducing costs. A recent study from the University of California, Berkeley and GridLab indicates that achieving a 90% clean-powered grid by 2035 could deliver wholesale electricity costs 13% lower than today, boosted by about $100 billion in transmission expansion investment.

Currently, many transmission projects are hampered by severely backlogged interconnection queues, outdated planning processes, and cost allocation debates that remain polarized. Lead times for large-scale transmission projects spanning up to a decade or more are unacceptable. Policymakers and stakeholders must act swiftly to address the regulatory and policy bottlenecks that threaten America's path to a cleaner energy future.

What is needed to meet the challenge? In short, we must address the three major policy hurdles to transmission development—planning, cost allocation, and permitting. First, as mentioned above, we need to plan the system in a way that anticipates future needs and unlocks our nation's abundant renewable resource potential. Second, we need to put in place cost allocation policies that equitably spread costs to beneficiaries of major projects, rather than placing all these costs on each incremental generator. Finally, we must ensure that permitting and siting processes are efficient and timely without undermining important environmental protections.

As part of this framework for policy reform, President Biden's proposal for an Investment Tax Credit for transmission offers a valuable tool to help lower costs for large projects and make it easier to achieve cost allocation agreements, which is a key hurdle to project approval and construction.

Regulatory Improvements Are Also Essential

While Congress has many tools to address the policy roadblocks mentioned above, the Federal Energy Regulatory Commission (FERC) will continue to play a central role in moving towards a proactive and broadly beneficial grid planning approach.

To create a policy environment for proactive investments in transmission, FERC should:

- Improve planning processes by requiring regions to recognize and "count" all the benefits of a given transmission project;
- Require planning scenarios to include state and corporate clean energy goals and realistic estimates for electrification growth;
- Develop new cost allocation policies to equitably and expeditiously integrate the significant amount of renewable energy projects waiting to be connected to the grid;
- Reform policies that make transmission development slower and more complex, especially those processes imposed under the rubric of "competition";

Conclusion

ITC supports the bipartisan goal of investing in the nation's transmission grid. We stand ready to work with Congress, FERC and others to ensure that we can seize this opportunity to improve the nation's transmission system, encourage and realize the blessings of abundant, affordable clean energy, as well as increase the

[4] The Coming Electrification of the North American Economy.
https://wiresgroup.com/the-coming-electrification-of-the-north-american-economy/

resilience of our energy system. By doing so, we can chart a pathway to a low-carbon energy system with benefits that are broadly shared across the economy. If we fail to act with urgency, the grid could become a significant roadblock to climate progress.

Thank you again for the opportunity to testify before the Committee. I look forward to working with Congress and the Administration to invest in America's clean energy future.

Ms. CASTOR. Thank you, Ms. Apsey.

Next, Mr. Colston, you are recognized for 5 minutes.

STATEMENT OF DONNIE COLSTON

Mr. COLSTON. Thank you, Chair Castor, Ranking Member Graves, and the members of the Select Committee. My name is Donnie Colston. I am the Director of the International Brotherhood of Electrical Workers Utility Department. On behalf of our President, Lonnie Stephenson, thank you for inviting me to testify on this importance of modernizing and expanding the electric grid.

The IBEW is the largest energy union in the United States, with 775,000 active members and with roughly 400,000 workers employed in generation, transmission, distribution, and construction.

It is said the North American electrical grid is the largest machine ever built by human hands. The interconnecting web of power plants, end users, and everything in between fuels the $22 trillion U.S. economy. However, our current electric distribution system, which was primarily built in the 1960s and 1970s, and functions on a regional or localized basis, needs significant replacements and upgrades now and in the coming years to maintain an enhanced system performance to deliver new, cleaner sources of power generation from its source to customers. The need to modernize and expand the electric grid has become even more pressing due to climate change and the need to reduce greenhouse emissions.

Any effort to markedly increase clean and renewable generation onto the electric grid will require a significant increase in the development of new transmission lines. At the IBEW, we see the need to modernize and expand the electric grid as a major work opportunity for our members. Reports released this year by Americans for a Clean Energy Grid and American Council on Renewable Energy found that building out electric transmission to deliver new renewable and clean generation and increase grid reliability would create between 240,000 to 600,000 direct jobs. The IBEW firmly believes our linemen are the best trained and most experienced workers to fill this anticipated need.

To provide one example, the IBEW is working with Avangrid to build the New England Clean Energy Connect. The NECEC is a $950 million investment that will deliver 1,200 megawatts of renewable hydropower from Canada to the New England energy grid. Once built, the project will employ around 600 IBEW members and create an additional 800 indirect jobs during the construction phase.

As a strong supporter of expanding and modernizing the electric grid, the IBEW supports policies that will enhance grid reliability and bring cleaner power generation to consumers and provide steady work for our members.

Siting and permitting are two of the biggest barriers to transmission construction. IBEW in general is supportive of policy changes that will improve the permitting process and ensure project applications are finalized in a reasonable, expeditious manner.

IBEW members are interested in blue-collar quality jobs, jobs that provide family-supporting wages with good benefits. The IBEW supports policies that would ensure federally funded construction and infrastructure projects meet the highest labor standards, policies that include Davis-Bacon Act and prevailing wage requirements and Buy American standards for key materials and products.

Additionally, these labor standards need to extend to all forms of Federal support, including tax credits, such as the investment tax credit or the production tax credit. The IBEW would also include tax credits to be paired, as called for in the American Jobs Plan, with a fair choice to join a union and bargain collectively.

With the Federal Government taking the decisionmaking lead, market predictability will improve, as will the IBEW's ability to plan for training the next generation of construction linemen. It takes 3 years to train a journeyman lineman to perform transmission line construction and maintenance, and we anticipate the need for at least 50,000 new power linemen over the next 10 years. While projects are held up, we are losing valuable training time.

The IBEW asks for the Select Committee's leadership on modernizing and expanding the electric grid, bringing new clean energy generation to consumers, ensuring grid reliability are goals of all Americans that can and should support. We remain a ready partner with our employers and elected officials from both sides of the aisle.

Thank you for the opportunity to participate in today's hearing. I am happy to answer any questions you may have.

[The statement of Mr. Colston follows:]

Opening Statement of Donnie Colston
Director, Utility Department

International Brotherhood of Electrical Workers

Before the Select Committee on the Climate Crisis

U.S. House of Representatives

May 20, 2021

Chair Castor, Ranking Member Graves, and the members of the Select Committee, my name is Donnie Colston. I am the Director of the International Brotherhood of Electrical Workers (IBEW) Utility Department. On behalf of our president, Lonnie Stephenson, thank you for inviting me to testify on the importance of modernizing and expanding the electric grid.

The IBEW is the largest energy union in the United States, with 775,000 active members and with roughly 400,000 workers employed in generation, transmission, distribution, and construction all in some way related to the electrical grid.

It is said that the North American electrical grid is the largest machine ever built by human hands. The interconnecting web of power plants, end users and everything in between fuels the $22 trillion U.S. economy. However, our current electric distribution system, which was primarily built in the 1960's and 70's and functions on a regional or localized basis, needs significant replacements and upgrades now and in the coming years to maintain and enhance system performance and deliver new, cleaner sources of power generation from its source to customers. The need to modernize and expand the electric grid has become even more pressing due to climate change and the need to reduce greenhouse gas emissions. Any effort to mark-

edly increase clean and renewable generation onto the electric grid will require a significant increase in the development of new transmission lines.

At the IBEW, we see the need to modernize and expand the electric grid as a major work opportunity for our members. A recent report by the Americans for a Clean Energy Grid found that construction of 22 identified transmission projects would create 240,000 direct jobs.[1] A separate report by the American Council on Renewable Energy stated that an investment tax credit for regionally significant transmission lines would create 600,000 transmission jobs and at least 330,000 transmission jobs for "projects weighted by odds of success."[2] These jobs projections, if true, would be a boon for our members and the communities that host these critical infrastructure investments.

To provide one example, IBEW is working with Avangrid to build the New England Clean Energy Connect (NECEC). The NECEC is a $950 million investment that will deliver 1,200 megawatts of renewable hydropower from Canada to the New England energy grid. Once built, the NECEC would be New England's largest source of renewable energy and help lower energy costs for consumers. The project will employ around 600 IBEW members and create an additional 800 indirect jobs during the construction phase. It is estimated that $440 million in worker compensation will be provided during construction, a significant injection of money for rural communities. The project will also provide notable benefits to Maine residents, including an $18 million annual increase in host community property tax revenues, $140 million in consumer rate relief and $15 million for fiber optic and broadband expansion for western Maine.[3]

A second transmission project IBEW members are ready to build is the Cardinal-Hickory Creek Transmission Line Project that is being developed by American Transmission Company, ITC Midwest and Dairyland Power Cooperative. The project is one of 17 high-voltage transmission lines that the Midcontinent Independent System Operator (MISO) approved to improve the reliability and flexibility of the regional electric grid. The 102-mile, 345-kilovolt line would connect renewable wind generation in Iowa to consumers in Wisconsin and throughout the Midwest. This project will employ over 100 IBEW members in northeast Iowa and southern Wisconsin and, like the NECEC, is an important investment in rural America.

As a strong supporter of expanding and modernizing the electric grid, the IBEW supports several policy proposals we believe will enhance grid reliability, bring cleaner power generation to consumers, and provide steady work for our members. The IBEW supports many of the proposals laid out in President Biden's American Jobs Plan. In particular, our union supports the administration's call for a $100 billion investment in the nation's power infrastructure. This includes the creation of an investment tax credit (ITC) for regionally significant electrical transmission projects. As noted earlier, a transmission ITC could be a important tool to incentivize the buildout of power lines that would provide significant employment opportunities for our members. However, we would call on policymakers to ensure that a transmission ITC is broadly available and aimed at getting transmission lines built.

The American Jobs Plan also calls for the creation of a new Grid Deployment Authority that would allow for "better leverage of existing rights-of-way—along roads and railways—and supports creative financing tools to spur additional high priority, high-voltage transmission lines."[4] Our union is supportive of the administration's efforts to become more engaged in facilitating transmission construction and use the federal government's authority to cut through existing roadblocks to build power lines of regional and national significance. Relatedly, the IBEW supports the Department of Energy's recent announcement of two financing tools intended to facilitate transmission line construction. These are the Western Area Power Administration Transmission Infrastructure Program's $3.25 billion fund for transmission projects and making $5 billion available for transmission projects through the Energy Department's Loan Programs Office. We hope these two new funding opportu-

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[1] Michael Goggin, Rob Gramlich, and Michael Skelly, "Transmission Projects Ready to Go: Plugging into America's Untapped Renewable Resources," (April 2021), *https://cleanenergygrid.org/wp-content/uploads/2019/04/Transmission-Projects-Ready-to-Go-Final.pdf*

[2] Michael Goggin and Rob Gramlich, "Investment Tax Credit for Regionally Significant Electricity Transmission Lines," (May 2021), *https://acore.org/wp-content/uploads/2021/05/Investment-Tax-Credit-for-Regionally-Significant-Electricity-Transmission-Lines-ACORE.pdf*.

[3] New England Clean Energy Project, *https://www.necleanenergyconnect.org/project-benefits/#developBENEFITS*.

[4] The American Jobs Plan, *https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan*.

nities will help overcome one of the biggest hurdles to power line construction: cost allocation.

Our union supports the use of existing rights-of-way to facilitate the siting of transmission lines. Our members are familiar with the difficulties surrounding the siting of power line and are generally supportive of policies that will help overcome barriers to grid modernization and expansion. However, transmission construction should not be unduly impeded if an existing right-of-way is not available for a proposed transmission project.

Siting and permitting are two of the biggest barriers to transmission construction. The IBEW, in general, is supportive of policy changes that will improve the permitting process and ensure project applications are finalized in a reasonably expeditious manner. There are recommendations from the Majority Staff's 2020 Report in this area that would help facilitate the siting and permitting process. These include the recommendation that Congress should amend the Federal Power Act to clarify that the Federal Energy Regulatory Commission (FERC) may exercise backstop siting authority for an interstate electric transmission line. We are also supportive of the proposal to authorize federal funding for the Department of Energy to provide technical assistance for state, local and tribal authorities to conduct transmission planning and review applications of proposed transmission projects.[5]

The IBEW is not just interested in job numbers—our members are interested in job quality. Many of our members join the IBEW due to our union's longstanding record of securing family-supporting wages with good benefits and a strong working relationship with our employers. For these reasons, the IBEW supports the Select Committee's 2020 Majority Staff Report recommendation to "ensure federally funded construction and infrastructure projects meet the highest labor standards."[6] We agree wholeheartedly with the Majority Staff Report that federal spending should include standards such as extending Davis-Bacon Act prevailing wage requirements and Buy America standards for key materials and products. Additionally, these labor standards need to extend to all forms of federal support, including tax credits such as the ITC and production tax credit (PTC). The IBEW would also include that tax credits be paired, as called for in the American Jobs Plan, with a "fair choice to join a union and bargain collectively."[7]

With the federal government taking the decision-making lead, market predictability will improve, as will the IBEW's ability to plan for training the next generation of construction linemen. It takes three years to train a journeyman lineman to perform transmission line construction and maintenance, and we anticipate the need for at least 50,000 new power linemen over the next 10 years. While projects are held up, we are losing valuable training time.

The IBEW asks for the Select Committee's leadership on modernizing and expanding the electric grid. Bringing new, clean generation to consumers and ensuring grid reliability are goals that all Americans can and should support. We remain a ready partner with our employers and elected officials from both sides of the aisle. Thank you for the opportunity to participate in today's roundtable. I am happy to answer any questions you may have.

Ms. CASTOR. Thank you very much.

Ms. Fisher, you are recognized for 5 minutes for your testimony.

STATEMENT OF EMILY SANFORD FISHER

Ms. FISHER. Good morning, Chair Castor, Ranking Member Graves, and members of the Select Committee. My name is Emily Fisher, and I am here today on behalf of the Edison Electric Institute. Thank you for the opportunity to speak about modernizing and expanding the energy grid. I am honored to be here with my fellow witnesses.

EEI is the association that represents all U.S. investor-owned electric companies. Our members provide electricity for more than 220 Americans and operate in all 50 States and the District of Co-

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[5] House Select Committee on the Climate Crisis, "Solving the Climate Crisis," (June 2020), *https://climatecrisis.house.gov/sites/climatecrisis.house.gov/files/Climate%20Crisis%20Action%20Plan.pdf*.

[6] *Ibid*.

[7] The American Jobs Plan, *https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan*.

lumbia. Collectively, the electric power industry supports more than 7 million jobs in communities across the country. Our members deliver the safe, reliable, affordable, and clean energy that powers our economy and enhances the lives of all Americans.

EEI member companies are leading a clean energy transformation. Carbon emissions from the U.S. electric power sector are at their lowest level in more than 40 years, and we are 40 percent below 2005 levels as of year end 2020. At the same time, 40 percent of the electricity that serves customers now comes from clean, carbon-free resources, including nuclear energy, hydropower, wind, and solar energy.

Our members are united in their commitment to get the energy they provide as clean as they can, as fast as they can, without compromising the reliability and affordability that our customers value. To this end, EEI's members will continue to reduce their emissions in future years with more than two dozen members committing to reach zero or net-zero carbon emissions by 2050 or faster. This cleaner electricity will play a key role in reducing emissions economywide, particularly in the transportation, industrial, and building sectors through increased electrification.

Electric transmission infrastructure is the backbone of the nation's energy grid and will be critical in facilitating the continued transition to clean energy. Our industry is the nation's most capital intensive, and since 2010, EEI's members have invested more than $1 trillion to build smarter energy infrastructure and to integrate more clean energy into the grid affordably, reducing both emissions and costs.

The transmission system also helps optimize the energy grid's performance, reducing congestion, enabling the deployment of new technologies, and enhancing reliability and resiliency.

The benefits of transmission are not in dispute, and there is broad agreement that more transmission investment is needed and is needed relatively quickly to meet clean energy reliability and resilience goals. Despite this broad agreement that we need more transmission, the pace of transmission development is slow. Transmission projects typically take 7 to 10 years to plan, site, permit, construct, and energize. Yet we have many examples of projects that have taken more than a decade from conception to completion and just as many examples of those proposed projects that were abandoned because progress was too slow and too costly.

Litigation can be a significant factor in these delays, and groups that support clean energy often oppose the infrastructure necessary to integrate more of it.

Our member companies and our labor partners can help build the transmission needed to meet and accelerate the achievement of clean energy goals. Unfortunately, the way the nation plans, permits, and pays for transmission are significant obstacles to building the infrastructure we need quickly. Making changes that align these processes with long-term clean energy goals will not be easy, but it is essential. I offer some high-level observations about what we may be able to do to deploy transmission more quickly.

With respect to planning, current regional planning processes are hindering, not helping, stakeholders identify necessary projects and get them built. Existing planning frameworks are too narrow in

terms of scope and scale. Planning should be oriented toward public policy goals and priorities and should be able to take into consideration future electrification scenarios.

Projects can and should serve multiple goals, from clean energy integration and improved reliability, to increased cost efficiency and increased resilience. It is also essential that frameworks focus on getting all stakeholders, including states and state economic regulators, on the same page with respect to goals and benefits as early as possible to ensure that proposed projects can move forward quickly once identified, both with respect to permitting and cost allocation.

With respect to permitting, in order to build large-scale transmission, a host of state and Federal approvals are needed. For example, critical clean energy infrastructure frequently requires Federal permits that trigger environmental reviews under the National Environmental Policy Act. These can take a really long time to complete and can be the focus of even more protracted litigation. EEI supports a NEPA process that is clear, transparent, and as efficient as possible, while meeting all environmental requirements.

Perhaps one of the most contentious issues is how to pay for necessary new transmission infrastructure. Current processes focus on assigning costs to those customers who benefit immediately and directly from the investment. This does not take into consideration the broader benefits of transmission for all customers.

To remove a critical obstacle to increased investment, it may be necessary to broaden the scope of benefits and beneficiaries considered, particularly as the transmission system, the generation resource mix, and policy goals change and are expected to change over time. As noted, getting all stakeholders on the same page with respect to the need for and the benefits of proposed transmission will be essential.

There are other ways to address the cost of transmission. Grants and other cost-sharing mechanisms to help pay for measures that will harden the energy grid and make it more resilient in the face of wildfires, hurricanes, and other natural disasters can help reduce cost pressures on customers, particularly when many of our customers are still recovering from the economic impacts of the pandemic.

Increased transmission investment is essential to meeting our nation's and our industry's clean energy goals. Our members are committed to investing in the energy grid and continuing to make it smarter, cleaner, stronger, more dynamic, and more secure. We look forward to working with this committee and Congress to help achieve these goals.

Thank you again for this opportunity, and I look forward to any questions you may have.

[The statement of Ms. Fisher follows:]

Statement by Emily Sanford Fisher

General Counsel, Corporate Secretary & Senior Vice President, Clean Energy

Edison Electric Institute

Before the

House Select Committee on the Climate Crisis

May 20, 2021

Good morning Chair Castor, Ranking Member Graves, and members of the Select Committee. My name is Emily Fisher, and I am here today on behalf of the Edison Electric Institute (EEI). Thank you for the opportunity to speak about modernizing and expanding the energy grid. I am honored to be here with Linda Apsey, President and Chief Executive Office of EEI member company, ITC Holdings, and with a representative of our labor partners, Donnie Colston from the International Brotherhood of Electrical Workers.

EEI is the association that represents all U.S. investor-owned electric companies. Our members provide electricity for more than 220 million Americans and operate in all 50 states and the District of Columbia. Collectively, the electric power industry supports more than 7 million jobs in communities across the country. EEI's member companies deliver the safe, reliable, affordable, and clean energy that powers our economy and enhances the lives of all Americans.

EEI's member companies are leading a clean energy transformation. Thanks largely to the efforts of EEI's members, carbon emissions from the U.S. electric power sector are at their lowest level in more than 40 years and were 40 percent below 2005 levels as of year-end 2020. At the same time, 40 percent of the electricity that serves customers now comes from clean, carbon-free resources, including nuclear energy, hydropower, wind, and solar energy.

Along with significant reductions in carbon emissions and increases in clean energy, America's electric companies have made equally significant reductions in emissions of more localized air pollution, which improves the health and well-being of the communities that our member companies serve. Since 1990, our industry has cut sulfur dioxide emissions by 95 percent and nitrogen oxides emissions by 88 percent. As a result of the Mercury and Air Toxics Standards and other Clean Air Act regulations, from 2010 to 2017, the power sector has reduced mercury emissions by 86 percent and total emissions of hazardous air pollutants by 96 percent. Nationally, total power sector mercury emissions have been reduced by 95 percent over the period 1990 to 2020.

These trends in emissions reductions and the deployment of clean energy will continue. EEI's member companies are united in their commitment to get the energy they provide as clean as they can as fast as they can, without compromising the reliability and affordability that our customers value. To this end, EEI's members will continue to reduce their emissions in future years, with more than two dozen members committing to reach zero or net-zero carbon emissions by 2050 or earlier.

A wide range of factors are driving the clean energy transformation, including declining costs for natural gas and renewable energy resources, technological improvements, changing customer expectations, federal and state regulations and policies, and the increasing use of distributed energy resources. As a result, the mix of resources used to generate electricity in the United States has changed dramatically over the last decade. This cleaner electricity will play a key role in reducing emissions economy-wide—particularly in the transportation, industrial, and building sectors—through increased electrification.

Transmission and the Clean Energy Transformation

Electric transmission infrastructure is the backbone of the nation's energy grid and will be critical in facilitating the continued transition to clean energy. Our industry is the nation's most capital-intensive industry, and, since 2010, EEI's member companies have invested more than $1 trillion to build smarter energy infrastructure and to integrate more clean energy into the energy grid affordably, reducing both emissions and costs. These significant investments ensure that customers receive the electricity they need, when they need it, safely and reliably. The transmission system also helps optimize the energy grid's performance, reducing congestion, enabling the deployment of new technologies, and enhancing reliability and resiliency.

In addition, transmission investments create jobs and provide a range of other benefits. They offer communities access to lower-cost, cleaner sources of electricity

that often are located far from densely populated urban centers.[1] They support the economic viability of clean energy projects by reducing costly curtailments of service due to congested pathways and overproduction, which allows more clean energy to reach more end-use customers.[2] Electric transmission investments also are essential to enabling greater transportation electrification.[3]

The benefits of transmission are not in dispute, and there is broad agreement that more transmission investment is needed and is needed relatively quickly when thinking about the timeline for building critical infrastructure.

According to a study by Princeton University, to achieve a zero-carbon future by 2050, the existing high-voltage transmission capacity will need to expand by approximately 60 percent by 2030 and triple compared to 2020 capacity through 2050 to connect more wind and solar energy resources. Total capital investment in transmission will need to reach $360 billion through 2030 and $2.4 trillion by 2050.[4] The Brattle Group, meanwhile, estimates that, to meet ambitious clean energy goals and low-carbon solutions around the country, $300 to $700 in transmission investment is needed per each kilowatt (kW) of large-scale renewable energy capacity added to the system.[5]

Obstacles to Needed Transmission Investments

Despite this broad agreement that we need more transmission this decade to meet clean energy, reliability, and resilience goals, the pace of transmission development is slow. Transmission projects typically take 7 to 10 years to plan, site, permit, construct, and energize—yet we have many examples of projects that have taken more than a decade from conception to completion, and just as many examples of proposed transmission projects that were abandoned because progress was too slow and too costly. Litigation can be a significant factor in these delays, too, and groups that support clean energy often oppose the infrastructure necessary to integrate more of it.

EEI's member companies and our labor partners can help build the transmission needed to meet and accelerate the achievement of clean energy goals. Unfortunately, the way the nation plans, permits, and pays for transmission are significant obstacles to building the infrastructure we need quickly. Making changes that align these processes with long-term clean energy goals will not be easy but is essential. Local communities, states, Tribes, and the federal government all have a role, and many stakeholders' views and perspectives must be considered. Today, I offer some high-level observations about what the federal government may be able to do to help deploy more transmission more quickly.

Planning

Current regional planning processes are hindering, not helping, stakeholders identify necessary projects and get them built. Existing planning frameworks are too narrow in terms of scope and scale. Planning should be oriented toward policy goals and priorities. Planning also should be able to take into consideration longer-term clean energy goals at the state and federal levels, as well as future electrification scenarios, and should take a broader approach to costs and benefits. Transmission projects can and should serve multiple goals, from clean energy integration and improved reliability to increased cost-efficiency and increased resilience.

It also is essential that planning frameworks focus on getting all stakeholders, including states and state economic regulators, on the same page with respect to goals and benefits as early as possible in the process to ensure that proposed projects can move forward quickly once identified, both with respect to permitting and cost allocation. This will be especially important in the context of inter-regional planning.

In general, planning frameworks should take a more holistic approach to assessing the need for, and benefits of, transmission. They also should be flexible enough

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[1] *See*, *e.g.*, American Council on Renewable Energy (ACORE), Macro Grid Initiative, *https://acore.org/macro-grid-initiative/#1601561682191-976f8114-ec26*.

[2] *See* World Economic Forum, Why Transmission and Distribution Are the Clean Energy Transition's Secret Weapons (Jul. 16, 2020), *https://www.weforum.org/agenda/2020/07/transmission-distribution-clean-energy-transition/*.

[3] *See* Weiss et al., The Coming Electrification of the North American Economy—Why We Need A Robust Transmission Grid, prepared for WIRES (Mar. 6, 2019), *https://wiresgroup.com/the-coming-electrification-of-the-north-american-economy/*.

[4] *See* E. Larson, C. Greig, J. Jenkins, E. Mayfield, A. Pascale, C. Zhang, J. Drossman, R. Williams, S. Pacala, R. Socolow, EJ Baik, R. Birdsey, R. Duke, R. Jones, B. Haley, E. Leslie, K. Paustian, and A. Swan, Net-Zero America: Potential Pathways, Infrastructure, and Impacts, interim report, Princeton University, Princeton, NJ, p. 106 (Dec. 15, 2020).

[5] *See* Weiss et al., n. 1, *supra*.

to take into consideration regionally important issues, such as wildfire mitigation or offshore wind interconnection. While the Federal Energy Regulatory Commission (FERC) has indicated that it intends to revisit planning frameworks and requirements, congressional direction may be essential in reorienting the planning process in a timely way.

In addition, the Department of Energy, in coordination with the National Labs, could be directed to provide some assistance by conducting a nationwide analysis to identify the areas with the most potential and need for transmission projects to address clean energy and system resilience needs.

Permitting

In order to build large-scale transmission, a host of state and federal approvals are needed to site and permit projects. The federal government can take several steps to reduce the time it takes to receive these permits, consistent with environmental obligations and requirements.

For example, critical clean energy infrastructure projects frequently require federal permits that trigger environmental reviews under the National Environmental Policy Act (NEPA), which can take years to complete and increasingly have become the focus of even more protracted litigation. This significantly adds to the time and costs of critical transmission projects necessary to meet these clean energy objectives. EEI supports a NEPA process that is clear, transparent, and as efficient as possible while meeting all environmental requirements.

To that end, there are four process revisions that can contribute to an efficient, environmentally sound, and defensible NEPA review:

1. **Tiering:** Utilizing "tiering"—considering existing studies and environmental analyses in the NEPA process—allows federal agencies to build upon these previously conducted environmental studies, as well as decisions made during earlier state or local public reviews, instead of starting from scratch.
2. **Categorical Exclusions (CE):** Agencies may now apply a CE established under another agency's NEPA procedures, if the action covered by that CE and the adopting agency's proposed action are substantially the same. This sensible step reduces duplication and should be allowed to continue.
3. **Greenhouse Gas (GHG) Emissions Analysis:** GHG emissions are relevant to NEPA analyses, and considering such emissions is appropriate in the context of environmental reviews designed to ensure well-informed decision-making. Agencies should consider existing emissions estimates when relevant, including sector-wide estimates, when assessing GHG emissions impacts. For example, transmission projects that displace emissions by enabling more clean energy integration should be recognized as such, even if that requires a broader assessment of emissions impacts.
4. **Applicant Engagement in the NEPA Process:** Allowing permit applicants and their contractors to participate in the preparation of documents for environmental reviews promotes efficiency by utilizing those in the best position to provide critical information about proposed projects to regulators. Applicants and contractors have ready-made information regarding project alternatives and potential effects, and they possess significant environmental and technical resources and engineering information that could enable more efficient and timely preparation and evaluation of environmental reviews.

Another option to help expedite siting and permitting for some transmission projects includes incentives to use existing rights-of-way, including those for transportation.

Transmission permitting and siting is complex. These suggestions would not solve all delays if implemented, but they could help expedite the process.

Paying

Perhaps one of the most contentious issues is how to pay for necessary new transmission infrastructure. Current processes focus on assigning costs to those customers who benefit from the investment, but some states that serve as conduits for new transmission often are concerned about whether they will see benefits from these projects. This process does not take into consider the broader benefits of transmissions for all customers.

To remove a critical obstacle to increased investment, it may be necessary to broaden the scope of benefits and beneficiaries considered, particularly as the transmission system, the generating resource mix, and policy goals change and are expected to change over time. As noted, getting all stakeholders on the same page

with respect to the need for—and benefits of—proposed transmission projects during the planning phase will be critical in determining how to allocate costs fairly.

There are other ways to address the costs of transmission. Grants to help pay for measures that will harden the energy grid and make it more resilient in the face of wildfires, hurricanes, and other natural disasters can help to reduce cost pressures on customers, particularly when many customers are still recovering from the economic impacts of the COVID–19 pandemic.

EEI's member companies take their commitment to providing reliable and resilient electricity seriously and are investing billions to harden the grid—they are installing concrete poles, moving substations to higher ground, putting technology on the grid that can sense fire and shut off a power line, and more. Federal dollars could help accelerate these adaptation investments. In addition, some federal funds can support ongoing efforts to modernize the energy grid to use the latest technologies and to improve two-way communication on the system with everything from smart meters to appliances to private solar and storage systems.

Conclusion

Increased transmission investment is essential to meeting our nation's and our industry's clean energy goals. A robust transmission system also enables electric companies to deliver energy where it is needed, to integrate more clean energy into the energy grid, to enhance the reliability and resiliency of the grid, and to lower the cost of delivering energy by reducing congestion. EEI's member companies are committed to investing in the energy grid and to continuing to make it smarter, cleaner, stronger, more dynamic, and more secure. We look forward to working with this Committee and Congress to help achieve these goals.

Thank you again for the opportunity to testify. I look forward to any questions you may have.

Ms. CASTOR. Thank you very much.

Mr. Skelly, you are recognized for 5 minutes. Welcome.

STATEMENT OF MICHAEL SKELLY

Mr. SKELLY. Thank you.

My name is Michael Skelly, and I am the founder and CEO of Grid United, and we are an early-stage transmission development company based right here in Houston, Texas, which, as many of you know, is emerging as a leader in energy transition. And I have been involved over the last 25 years in many wind generation and solar generation projects, as well as lots of transmission lines, including some that, as Ms. Fisher pointed out, are now in construction and others that got killed off because of too many delays and too many obstacles to get them done.

I thought I would focus a little bit on what has happened in the last 10 years and the opportunity set that is before us.

And the first thing I would like to talk about is the exciting companies that have emerged over the last decade that use situational awareness diagnostics and ultrafast processing power to get better use out of the existing grid. And these technologies commonly known as grid enhancing technologies have emerged. A number of companies have emerged based here in the U.S. that will help us get better—basically, move more power through the existing grid, and that is something that we can do and that Congress can act on in the near future using existing authorities. So I would encourage you all to focus on that.

Next up, I co-authored the study that a number of folks have referred to that identified 22 shovel-ready, high-voltage transmission projects around the country being developed by folks like ITC, Ms. Fisher's member companies, and a number of independent developers of transmission lines. And over the last decade, these companies have slogged through the processes that, as we all know, take

a very, very long time, and they are ready to go. And the criteria that we use to identify these projects was, okay, what can we get underway in the next 24 to 36 months? And I am happy to talk in detail about any of those projects or the processes they are going through.

But what we need is some successes, and as we all know, success begets success in many walks of life, including infrastructure development. And this opportunity set that is before us now, with a little bit of a push from things like the investment tax credit, we can get these projects done. They will unlock tens of thousands of megawatts of new generation projects, put lots of IBEW members to work, and boost today's level of renewable energy penetration to even higher levels, and help address some of the reliability issues that we have become painfully aware of, particularly in places like here in Texas.

And while the—the other point that I would like to sort of highlight again is that the—Ms. Apsey pointed out some of the problems with the current transmission planning process. I won't reiterate those, but suffice it to say that we need planning processes that take into account all of the benefits that we get from transmission, and we need to think in a much broader fashion about the public policy goals that the transmission investments can help us achieve.

We have largely solved the problem over the last 30 years with continued investments in R&D and scaled up deployment of renewables, and we now know how to produce wind power and solar power incredibly inexpensively. We have solved that challenge. The big challenge ahead of us now is building the grid so that everybody in the country can get access to those cheap resources. And as we build out the grid, we will do what we have done here in Texas when we did a big transmission expanse in the mid-2000s, we will help drive economic development, come up with a cleaner energy mix, and bring down costs to consumer.

So thank you very much, and look forward to your questions.

[The statement of Mr. Skelly follows:]

Statement by Michael Skelly

Founder and CEO

Grid United, LLC

Before the House Select Committee on the Climate Crisis

May 20, 2021

Good morning Chair Castor, Ranking Member Graves, and members of the Select Committee, and thank you for the opportunity to testify before you today.

My name is Michael Skelly and I am founder and CEO of Grid United, an early stage transmission development company. I have spent the last 25 years developing a wide variety of energy projects. I got involved in the US wind industry in the late 90's, and helped put together thousands of megawatts of new wind projects. In 2009 I started a company called Clean Line Energy which focused on interstate power lines to move renewable energy around the country. We successfully permitted a three-state high voltage, direct current transmission line. We sold off our projects several years ago to other developers who are carrying them forward. Indeed, our Western Spirit project is now under construction in New Mexico.

I live in Houston, Texas, which is fast becoming a national center for renewable energy development. The combination of an entrepreneurial ethos, abundant wind and solar in Texas' wide open spaces, an open access grid, and policy innovation that began with then Governor George Bush and continued with Governor Rick Per-

ry's push to expand Texas' transmission system, has made Texas a leader in wind and solar, and we are now witnessing an explosion in energy storage installations.

The recent outages of winter storm Uri are not the subject of today's hearing, but must be mentioned. As we all know, for four days in February, 4.5 million Texans became harshly aware of the grid and its critical importance to everything we do. Importantly, Texas' high voltage grid itself held up quite well and few outages were attributed to transmission problems, but generators, including gas, nuclear, coal and wind generators all had problems. No generation source covered itself in glory. One key lesson from the Texas experience is that the transmission investments initiated by Governor Perry made a bad situation less awful. Another key lesson is that networked systems perform better than isolated systems. Personally, while I believe Texas' electrical independence serves the state well and has enabled us to build more generation quickly, we would be well served by more asynchronous DC ties to neighboring states. Those interregional transmission ties would allow Texas to export its energy bounty in times of surplus, help our neighbors when their supplies are tight, and enhance our reliability by importing when we need it. All regions need to perform scenario planning for extreme weather, and if they do, they will all find significant benefit to such interregional ties. Anything Congress can do that simultaneously recognizes Texas' independent streak while facilitating connections to adjacent control areas will serve us all well.

In April of this year, I co-authored a study identifying 22 shovel-ready high voltage transmission projects around the country that would begin construction in the near term if more workable transmission policies, like the tax credit, were enacted. These projects would create over 1.2 million jobs across the transmission, wind, and solar sectors; interconnect 60,000 MW of new renewable capacity; and increase America's solar and wind generation by 50% from current levels. A decade ago, we as a country did not have such a fantastic opportunity set in front of us. However, in the ensuing years, both utilities and independent developers have been sorting through the nettlesome siting, permitting, cost allocation and grid connection challenges. I am firmly convinced that success will beget success in transmission, and pushing these 22 projects over the top will invigorate efforts across the country—resulting in more jobs, enhanced domestic supply chains, and big construction jobs, especially in our hard hit rural areas.

Aside from the economic benefits these projects embody, they also represent improved health outcomes for residents of population centers living near fossil-burning power plants. Transmission plays a role in replacing the carbon and other pollution in these population centers with renewable sources of energy, thereby improving air quality for residents, and addressing long-standing environmental injustices.

Before I talk about policy mechanisms that can help us improve reliability and get more clean energy on the grid, I'd like to first address the critical importance of getting as much bang for the buck for the investments we have made in the existing grid. Over the last decade, a number of exciting companies, in some cases with public R&D support, have developed "Grid Enhancing Technologies". These companies harness the power of situational awareness and ultrafast processing of information to adjust the throughput of existing wires, allowing them to get more power to market more efficiently. A number of these technologies were not mature a decade ago, but now they are, and most of the promising companies in this space are based here in the United States.

Forward thinking utilities like Xcel, MidAmerican and National Grid are deploying them already. FERC Chair Richard Glick and his predecessor have taken an active interest in encouraging utilities and system operators to adopt these technologies. Congress could play a critical role by appropriating funds to share in the cost of their deployment—an approach that will save customers money, enable more renewable power, and enhance reliability.

But better use of the existing grid alone won't do the job alone.

We have largely solved the problem of producing wind and solar electricity in a cost effective fashion. Now we need a better grid to pull it all together.

The Investment Tax Credit for Regionally Significant Electricity Transmission Lines, would be an essential tool in developing American grid infrastructure. The proposed 30% tax credit would unlock new merchant transmission lines as well as rate regulated ones, ultimately unlocking investment and reducing costs to consumers.

As Congress considers an investment tax credit for transmission lines, it's perhaps helpful to dive into the mechanics of how transmission lines get paid for today and why we aren't getting all the grid we need to combat climate change. In this context, one must look at the two business models that support the financing and construction of new transmission lines.

The great majority of transmission projects built in the US come about as a result of regional grid planning exercises. System operators project growth in demand, make assumptions about plant retirements, and project what new projects might get built. Individual transmission lines or groups of lines are looked at on a "benefit to cost" ratio. If new lines will benefit the system, say on a 1.5 to 1.0 benefit to cost test, the system operators, working with state regulators, see to it that the lines get built. If the projects don't pass that test, they don't get built. The rub lies in the fact that in almost all cases in the US, carbon externalities are not factored into the grid planning process. Sometimes carbon is included in scenario planning, but rarely is carbon used in the benefit to cost tests. Not surprisingly, this means that we are not planning the grid around a carbon constrained world. While not a perfect policy tool, an Investment Tax Credit can make up for this deficiency in the planning process. The ITC would have the effect of lowering the denominator in the benefit to cost test. More lines would make it through the planning process, and we will end up with a lower carbon grid.

The other type of transmission lines that get built are called "merchant" lines. These are typically built outside the conventional planning process, and their economics rely on generators paying the developers of merchant lines to deliver their power across long distances to get to market. An ITC will help reduce the cost of the transmission service, and therefore more lines would get built, and more renewable energy projects will follow. Importantly, merchant lines often provide reliability and other services to the grid for which they do not get paid—despite the fact that such services can be extremely valuable. An ITC will help make up for this market failure.

In both the merchant and regionally planned approach, the ITC is passed through to consumers.

While the tax credit is beneficial to unlocking these shovel-ready projects, the timeline for new interregional transmission can take a decade to complete. The Federal Energy Regulatory Commission has the authority to break the planning and cost allocation logjams that are preventing high voltage interregional projects from being built. Among other reforms, the Commission should consider directing regional planning authorities to evaluate future system needs based on a range of plausible scenarios, including high renewable penetration; link the interconnection and transmission planning processes; and consider non-transmission alternatives to costly local replacement projects that don't move the needle on bulk power flows. Research has shown incorporating non-transmission such as Grid Enhancing Technologies can yield significant returns and unlock previously untapped capacity, efficiency, and resilience.

High voltage transmission lines are the ties that bind regional grids and build resiliency. With renewed effort, we can enhance and modernize grid infrastructure, create the jobs of tomorrow, improve health outcomes for the most vulnerable, and reduce the costs of running one of the world's most complicated technological wonders. We should take the forewarnings of recent regional grid failures as a national call to action to rebuild our infrastructure along an interregional framework with the tools, technology, and policy delivery mechanisms we have at our disposal today.

Thank you for the opportunity to testify, and am happy to answer any questions you may have.

Ms. CASTOR. Well, thank you very much.

I want to thank all of our witnesses for their very insightful testimony. And I will recognize myself for 5 minutes for questions.

You know, a reliable electric grid powers everything we do. And I think it is clear that we have a consensus here that investments in transmission would benefit consumers across the country. We have to fix some of the flaws too that were highlighted by the catastrophe, fatal catastrophe, in Texas and others. So this piece of an infrastructure plan focused on electric transmission is just going to be critical, and I think there is common ground here.

So, Ms. Apsey, you have now watched a growing consensus here in Congress. President Biden has put forth his American Jobs Plan. Here in the House, we are probably ahead of the Senate with LIFT America and CLEAN Future. When you look at the pieces of legislation that are on the table right now to be considered as we ham-

mer out an infrastructure plan, what is most important, and do you see anything—any pieces that are missing?

Ms. APSEY. Great. Thank you, Chair Castor, for that question.

Yeah, absolutely there are, you know, I would say, multiple, you know, I think indications both from the administration, in different bills, the investment tax credits. You know, I think for us, and given our business and our experience, you know, anything that I think can help drive and facilitate the regional planning process—because really what we need is, you know, utilities make significant investments every day to maintain the reliability of their grid. But when it comes to planning, you know, across multiple transmission owners, across multiple states, across multiple regions, we don't necessarily have the processes that facilitate that. We have had some positive momentum about a year—about 10 years ago, with the Midwest Regional Transmission Organization, with their MVP portfolio of projects, but since that time, we really have not seen any other meaningful regional transmission.

So legislation or efforts that can advance—and I think both Emily and Mr. Skelly spoke to this—where we can include, you know, the multiple benefits that transmission provides, transmission integrates and provides access to renewable energy. It also continues to provide access to existing generation assets. It provides resiliency. It provides reliability. It provides economic benefits. And all of these benefits have to be included as we do our studies.

And if we can do that, what will occur is that the benefits will speak for themselves and that then we can move forward to actually realize these transmission projects, rather than them being stuck in sort of what we call the planning do-loop of the scenarios and the assumptions.

And so there are—there are specific provisions that do advance regional planning, and we would strongly suggest that we continue to put our shoulder behind those. I think the investment tax credit is an important tool in our toolbox to continue to realize meaningful investment in regional and interregional transmission infrastructure.

Ms. CASTOR. Thank you.

Yeah, and I am glad you mentioned that, because I am working on legislation in the Energy and Commerce Committee to address the expansion of the transmission system, the preplanning, the incentives for states to do that planning. Secretary Granholm yesterday in a hearing highlighted existing rights-of-way. So we have got to get down to brass tacks now in those details.

So, Ms. Fisher, I know you care about this and you are—all the utilities do as well. One of the key pieces to moving to clean energy and expanded grid is going to be a clean energy standard and an energy efficiency standard. States are different, though, across the country, and we want to make sure at the Federal level we have the incentives working correctly. I mean, many utilities have been focused for decades on selling as much power as possible, but we have to have the incentives for energy efficiency and conservation.

So what is the—what do we need to be doing, from your point of view, on a clean energy standard and an energy efficiency standard?

Ms. FISHER. Thank you so much for the question, Chair. As a sort of preliminary matter, actually our members have been delivering energy efficiency solutions to our customers for a really long time and have been partners with our state regulators to find ways to help our customers use less energy and control their energy costs. I think we are kind of unique in that we are the only people that actively help people use less of our product. And we have saved, you know, terabytes, trillions and trillions of megawatt hours of electricity over the last decades on energy efficiency.

So we definitely agree that one of the first tools for managing emissions is efficiency, and we look forward to continuing to partner with our customers and our state regulators on those processes.

Ms. CASTOR. Well, I have run out of time. So hopefully you can address the clean energy standard down the road. Thank you.

Next, I will recognize Ranking Member Graves for 5 minutes.

Mr. GRAVES. Thank you, Madam Chair. I appreciate all the witnesses' testimony.

Ms. Apsey, I want to ask a question. We have talked about some pretty substantial investments required to kind of modernize the grid. Do you see sufficient capital just in your work in the states—I believe in the Midwest—where you have been operating? Do you see sufficient capital that is available and being invested in transmission?

Ms. APSEY. Absolutely. Thank you for that question. Yeah, absolutely. I would not say that the issue or concern with investment in transmission is access to capital. I think what the issue and concern is more in terms of, obviously, the amount of time it takes to plan, to receive the necessary approvals. And, obviously, you know, these are major, major large transmission projects that take time in and of themselves to construct.

And so from an investor perspective, you know, investors want clarity. They want stability and policies, right, as they consider making those investments into businesses like ours or any other utility. Investors need stability.

Certainly, you know, we—you know, we—you know, for us, access to capital is not the concern. It is more the inherent processes and the amount of time it takes to realize that investment in transmissions.

Mr. GRAVES. Thank you.

Could you talk about perhaps—and I know you have had all sorts of experiences, but maybe talk about an experience where you had especially bad memories in terms of trying to move forward on a transmission project, perhaps, where you ran into regulatory obstacles or got stuck in the do-loop?

Ms. APSEY. Sure. Well, thankfully, I would say the good news is, you know, because to date most of our investments in transmission have been sort of, I would say, within our own footprints, our own geography, our own control, and we worked very well through our RTOs, our stakeholder processes, our communities, in order to, you know, site and permit those facilities.

You know, one project I would identify, it was first identified through this MISO RTO, you know, portfolio of projects, and that is our Cardinal-Hickory Creek Project. So it has been in the planning process and the execution phase for over 10 years now and,

you know, we have spent considerable time, considerable years, going through the necessary, you know, environmental reviews, environmental processes, working with all the various stakeholders. And, you know, while we continue to move forward with that project, there is pending litigation.

And so, obviously, from a risk perspective, a certainty perspective, obviously, those types of things just can serve to delay the ultimate realization of the benefits that that type of project would bring.

Mr. GRAVES. Ms. Apsey, is it fair to say that in many cases that some of these process obstacles are preventing the deployment or transmission of clean energy in some cases?

Ms. APSEY. Yeah. Well, certainly, that is one hurdle, one obstacle, as I mentioned. You know, there is multiple hurdles in realizing transmission investment, you know, planning——

Mr. GRAVES. OK. Let me—thank you very much.

And I just I want to make reference. We have introduced legislation called the BUILDER Act that tries to reform at least part of this process, and certainly would appreciate any feedback that you or your folks would have based on some of the experiences that you had in trying to build transmission.

I want to say this again. I said it in the opening. I do think that the Chair and I, and I think everybody on the committee, shares concerns about the—this regulatory process and how we ensure that it is scaled or tailored in a way that allows us to actually realize the benefits of a modernized grid and some of the new energy sources that will be transmitted.

Ms. Fisher—and I apologize. I think I made reference to your either middle or maiden name—sorry about that—when I referenced your testimony earlier. But just want to ask you if you have any thoughts or feedback on some of the regulatory reforms that perhaps would be needed, keeping in mind the tripling, perhaps, of the capacity that you have noted in your testimony?

Ms. FISHER. Thank you for the question, Ranking Member Graves. And you made my dad really happy by mentioning my maiden name, so thank you.

You know, we have engaged with both this administration and the prior administration on efficient NEPA reviews in particular, and there are ways to make those processes be a little bit more efficient, take less time, but still be totally faithful to the environmental goals and purposes of that statute. You know, it is an information-gathering statute, not an outcome-determinative statute, and there are some basic process improvements that I included in my testimony, my written testimony.

But, for example, one of the things that we think would be truly important is being able to use the same Record of Decision that one agency developed if another agency also has a permitting authority. That seems like an important way to avoid duplication. That—you know, we also think that the project proponents, like Ms. Apsey, should have a role in being able to provide relevant information to the agency that is conducting the review. They are closest to the projects and they have the most information.

One really important change for us actually would be a more holistic approach to greenhouse gas emissions so we could actually

recognize the greenhouse gas benefits that these projects provide. We are often not allowed to do that and not to contextualize these projects appropriately.

Ms. CASTOR. Thank you very much.

Mr. GRAVES. Thank you. Appreciate it.

Ms. CASTOR. Next, we will go to Rep. Brownley.

Ms. BROWNLEY. Thank you, Madam Chair. And thank you all for being here this morning.

Ms. Apsey, my first question is, it is my understanding that the House E&C Committee has proposed a new program for the Department of Energy that would provide Federal assistance and technical assistance to state, local, and Tribal authorities to help them better participate in this process. Do you think such a program would help in terms of, you know, the overall acceleration of the, you know, 10-plus-year timeline it takes to—that we often see with transmission development?

Ms. APSEY. While I don't have any specific knowledge or information on what you are specifically referring to, you know, stakeholder processes are important. All of our business operations we participate through regional transmission organizations which have stakeholder processes. We then are further involved in stakeholder processes through any of the siting—state siting processes or Federal siting processes.

So my recommendation would certainly be that—and perhaps to Ms. Fisher's point—I think anything that we can do to drive more collaboration and coordination, you know, sort of under, if you will, one umbrella, I think would be most important and most valuable so that we don't add additional time to the process. We already go through multiple levels of stakeholder interaction, stakeholder collaboration, and certainly every voice is important in that process.

Ms. BROWNLEY. Thanks. And you also mentioned, you know, the investment tax credit being an important tool in the toolbox. And, you know, there have been many who have estimated that if we did the investment tax credit correctly, that could yield 20 to 30 gigawatts of additional capacity to the grid. Do you think that is the proper yield strictly through an ITC or does that mean—do we have to do the ITC with modifications to regulations wrapped around it?

Ms. APSEY. I would strongly suggest that we need both. I think we need an all-in approach. I don't think there is a silver bullet. Transmission is incredibly complex. It takes a very long time to plan and to receive the necessary approvals and then ultimately construction.

We have processes in place today that have worked and that have yielded significant benefits for consumers. So I don't think—I don't think we are looking to make a wholesale shift in how we pay or incentivize transmission. I think we have got a lot of existing processes that do work, but I certainly think we do need additional tools in the toolbox, as well as some regulatory reforms.

Ms. BROWNLEY. Thank you.

And I have got a little bit more time.

Mr. Skelly, you have mentioned your, you know, siting of many shovel-ready projects. And would an ITC, you know, get those mov-

ing quickly? And what kind of yield would that bring in terms of expansion to the grid?

Mr. SKELLY. Yeah, I do think it would be very helpful for two reasons. There is two types of transmission lines. One that are cost allocated that come out of the planning process. And because our current processes don't take into account growth and things like electrification and don't take into account carbon emissions, that failure to account for them means that they don't make it through the planning hurdles. Okay? And ITC, by bringing down the cost, would get more projects through the planning process and we get more built.

On merchant lines, i.e., developed by independent developers, you basically get paid to move power and—but you also provide reliability and ancillary services benefits to the grid, which you often don't get paid for as an independent. And an ITC, while an imperfect mechanism, okay, provides some sort of rough justice and helps get these merchant projects done, and in a sort of roundabout way compensates them for the benefits that they provide to the grid.

Ms. BROWNLEY. And, you know, I don't have much time. So I will yield back, Madam Chair.

Ms. CASTOR. Thank you, Rep. Brownley.

Rep. Palmer, you are recognized for 5 minutes.

Mr. PALMER. Thank you, Madam Chairman.

First of all, I want to address the issue of the cost of this and the reliability of it. There was an audit of the German electrical grid. You know, they have done away with coal and nuclear and they have tried to go to renewables, and this audit found that electricity prices, residential electricity prices in Germany are 43 percent higher than the average for the other EU countries, and their electricity prices were already high. According to the report, it caused chaos to producers and consumers and threatened the German economy. So I find it interesting that my colleagues across the aisle keep saying that this is going to be cheaper than the way we produce electricity right now.

So, Mr. Skelly, I just, because our—I know we are talking about a complete replacement of the grid, but even that will still require a consistent baseload. How do you expect to achieve that without some backup?

Mr. SKELLY. Okay. So we have a few big advantages over the Germans. We have much better wind and much better solar resources, and because of that, that makes our costs dramatically lower.

In terms of reliability, one thing that we know about network systems is network systems—and we saw this with Colonial Pipeline last week—if we had had a whole network of pipes, okay, we wouldn't have relied on just one pipe. So when you build a network system, you always get better reliability. And what we are talking about here——

Mr. PALMER. Mr. Skelly, from an engineering perspective, unlike natural gas, which you can increase the output almost immediately, you can't do that with wind and solar. It requires substantial battery storage. And just—MIT reports that just getting to 12 hours, storage will cost $2.5 trillion. And I assume that you are counting on the taxpayers to pay for that.

The fact that Germany is in the position it is in with its electric grid may be explaining—may help explain why they are so desperate to cut this deal with Germany.

In regard to permitting, I think that is a huge issue for us. I mean, under the current permitting regime right now, you can't even get the paperwork done in the timeframe that my Democrat colleagues think that the planet has left.

But if we expedite the permitting, would each of you be okay with building transmission lines across wetlands and rivers and sensitive habitat which holds up so much of our infrastructure construction right now?

Would you be fine with that, Ms. Apsey? It is a yes or no. It is a yes or no.

Ms. APSEY. Well, certainly, yes, anything to expedite. But certainly there are considerations that obviously we want to be sure that we don't find ourselves in litigation that would further extend the timeline.

Mr. PALMER. That leads me to—the next question is for Ms. Fisher. You in your testimony talked about litigation being a significant factor in infrastructure projects. Do you see how these issues that we have been dealing with for years will continue to persist in the permitting process? And if you can be very brief, I would appreciate it.

Ms. FISHER. I think some clear direction on permitting might help resolve some ongoing litigation challenges.

Mr. PALMER. Okay. There is a couple of other things I want to point out about this having a consistent network. One is that it will require inverters, going back to what I was trying to explain about the fact that you can't just ramp up your power load with renewables immediately. And China is really inserting themselves into that. That, I think, creates some national security concerns for us and particularly when we are so reliant on China already for rare earth minerals and other minerals that we are not mining nor refining nor manufacturing ourselves.

Wouldn't that create a major problem down the road, increasing our reliance on China, Ms. Fisher?

Ms. FISHER. We are very committed to the cybersecurity of our supply chain. And we have been talking with all of the parts of that supply chain, particularly with respect to inverters, to ensure that they are cyber-safe. It is a priority for all of our companies.

Mr. PALMER. Madam Chairman, just a point of personal privilege here. I do think there is another issue that we need to take into account, and that is the potential for major solar flares, known as a coronal mass ejection. Lloyd's of London has major concerns about it. And what we once considered a once-in-100-years episode, we are now saying has a 4 to 13 percent or 12 percent chance of happening in a decade. And I think the committee should at some point take that under consideration.

I was shocked yesterday to find out that Energy Secretary Granholm knew nothing about that, even though it has been something that has been worked on the last three administrations.

So if——

Ms. CASTOR. Thank you, Rep. Palmer. Let's work on that.

Mr. PALMER. I appreciate that. And I yield back.

Ms. CASTOR. Next, we will go to Representative Huffman for 5 minutes.

Mr. HUFFMAN. Well, thank you, Madam Chair, and thanks for this hearing. I think, once again, you have found a space in this climate debate where there is—there is ample room to work together and collaborate and do things that shouldn't be controversial, that seemingly are pretty obvious.

We know expanding and modernizing our country's electrical grid is key to unlocking the next phase of access to clean, reliable, affordable, renewable energy. As we have heard here today, a clean energy grid is the foundation really for decarbonizing all sectors of the economy, from transportation to buildings to industry.

But, you know, for years, we have been told, mostly by the fossil fuel industry but also by some grid operators and utilities, that this vision of a carbon-free power grid powered mainly by renewables is unrealistic. Even just a few years ago when I was a California legislator, I was told that our, at that time, 33 percent renewable portfolio standard was unattainable.

But 3 weeks ago, Madam Chair, something really interesting happened. For a few minutes, California hit a remarkable milestone. Ninety-five percent of our electricity came from renewables. We have been bringing solar, wind, and storage online faster than anyone previously predicted.

And suddenly, the conversation is not about if we can hit our 100 percent clean energy goal, but whether we can do it faster than 2035. And it brings to mind this principle of a broken window at which things that are thought to be impossible suddenly become inevitable. And no matter how much the opponents of clean energy tried to pull that over to a window back to the previous century's thinking, there is nothing like seeing the fifth largest economy in the world powered almost entirely by renewables or an all-electric F–150 that blows away the internal combustion version of that iconic truck. So it proves that the times are changing, and our job should be to make sure that change comes in time to save the planet.

So, Mr. Skelly, would you speak to this question of what is possible when it comes to incorporation of renewable sources of energy onto the grid? How can we achieve this 100 percent clean energy goal? Is it doable?

Mr. SKELLY. Well, first off, I put in my deposit for a electric F–150 last night so I am very excited about those as well.

And second, I share your fascination with the topic on, like, how much renewable energy can we put on the grid. And I have been doing this stuff for, like, 25 years. And when we started out, the grid operators, said, oh, wow, if we go over 5 percent, like, we don't know how we are going to keep the lights on here. And this crazy, what you guys are talking about, even with a small project.

And what we found is that everybody is more capable at figuring this out, a lot more quickly than we ever imagined. So the grid operators have figured it out, the meteorology has gotten better, the technology has gotten better. And we have all just sort of learned and this is how we have gotten to 98 percent. I mean, here in Texas we regularly go over 50 percent renewables. If somebody had told me that that was going to happen 20 years ago—and I was,

like, an industry advocate—I would say, like, no way. That is never going to happen. You are out of your mind.

But to the point on transmission, one of the things—and NREL has done some very interesting work on this topic—one of the things we found is that if we want to increase a percentage, transmission helps us do this. And MISO, one of our most important grid operators, what they have discovered is that fronts move from the West to the East. And because we built out the grid in the upper Midwest, that allows us to distribute the wind across the Plains, because in the Western Plains, it is blowing hard but not yet in the Eastern Plains, if the front moves across, then they can move the energy back to the West.

Mr. HUFFMAN. Thank you for that.

Mr. SKELLY. So it is a really important piece to address some of these issues that we are going to tackle and we have proven we can tackle. And——

Mr. HUFFMAN. I appreciate that. I just have a moment left. In addition to more renewable energy, of course we want a grid that doesn't spark fires every time the wind blows.

And so Ms. Apsey, I want to ask you, as someone who represents arid California, how will these grid modernization investments also address the fire-prone nature of our current grid?

And I know I am out of time so I will yield back in advance, Madam Chair. But if there is time to allow a brief answer, I would greatly appreciate it.

Ms. CASTOR. Let's take that for the record, because we have a vote that has been called.

And my intention is to go for as long as possible. And we may have to take a quick recess at the end of the time period for the first vote.

So Mrs. Miller, if you are ready I will recognize you for 5 minutes.

Mrs. MILLER. Thank you, Chair Castor and Ranking Member Graves. And thanks to all of you all for being here today.

I agree with my colleagues that modernizing our electric grid is paramount. A strong and reliable grid ensures that we can continue to keep our lights on in our homes, our schools, and our businesses and reduce our carbon emissions. There is certainly space for renewables in our grid modernization.

However, I think we all understand that renewables are not currently in a place to power the entire grid. We must ensure that we have a key baseload energy—coal and natural gas—to fill in the gaps to keep the lights on when renewables cannot. I am sure my colleagues from down South can attest to this and the importance of having a resilient grid, particularly after the storms that were down there as well as in my state in West Virginia.

In order for our grid to be reliable, we need to ensure energy can be transported quickly and efficiently. Pipelines are infrastructure. The actions this administration has taken on the Keystone Pipeline not only cost American jobs but will cost the American energy grid. Ms. Fisher, how important is baseload energy, such as coal and natural gas, to balancing the electric grid?

Ms. FISHER. Thank you very much for the question, Congresswoman. We use a very diverse range of resources to ensure that

we are able to provide reliable electricity. So right now we do rely on resources like nuclear, natural gas, and coal to provide electricity and to address variability in renewable resources.

Many EEI members see a path to 80 percent emission reductions using current technologies including renewables and storage, but we are focused on developing those clean 24/7 resources that will help us provide reliability long-term as we continue to decarbonize.

So thank you for the recognition of the importance of that.

Mrs. MILLER. Well, you had mentioned in your testimony that natural gas is one of the factors that are helping to drive clean energy transformation. What else is needed to increase the deployment of natural gas?

Ms. FISHER. We actually are the largest users of natural gas in the country right now, Representative. So we use natural gas right now to provide more than—I think it is close to 40 percent of the electricity generated in the United States last year. So we rely on that. And we want to make sure that we have continued access for it as we are developing those clean technologies that will allow us to provide 24/7 support in a cleaner future.

Mrs. MILLER. Well, what positive changes could be made to our energy infrastructure to decrease the cost to the consumers?

Ms. FISHER. We have been very fortunate, thank you for the question, that we have been able to reduce emissions 40 percent over the last about 5 to 7 years while——

Mrs. MILLER. Wow.

Ms. FISHER [continuing]. Keeping the energy crisis flat. But we are constantly concerned about the impacts to customers. And I think there are ways to help mitigate some of the potential increases in costs to customers.

There was some discussion today about the value of the ITC for transmission and mitigating cost. We also see some value in mitigating costs to address the wildfire issue, to help us offset the cost of some of the hardening that we will need to take to make sure that the grid is resilient to different hazards across the country.

Mrs. MILLER. Thank you so much.

Chairman, I yield back whatever time I have left.

Ms. CASTOR. Thank you, Representative Miller.

Next we go to Representative Levin.

You are recognized for 5 minutes.

Mr. LEVIN. Thank you, Chair Castor. Thank you for holding his hearing. And I do appreciate the bipartisan nature of the topic today.

Mr. Colston, I wanted to first give a shout to the IBEW in my area, San Diego in Orange County. I have great relationships with them. And I know they are excited about the future of the electric grid and the role that IBEW will play. We know when President Biden talks about climate, it is always jobs, jobs, jobs. The American Jobs Plan, of course, focusing on a lot of this. And I wanted to ask you what jobs impact do you expect the highlighted aspects of President Biden's proposal to have? And bottom line, what will this mean for your membership?

Mr. COLSTON. Clearly the IBEW is fully supportive in all of the evolved fuel sources. When we talk about that it is infrastructure. Infrastructure creates jobs. Technology creates jobs for the IBEW.

As we build out the grid itself, that allows the IBEW to bring in more members to build out the grid itself.

As we electrify IBEW's fully supportive of electrifying the grid as it is. Electric charging station in as many places that we can. That produces jobs as well. And when we talk about technology, technology made in the United States, that produces good manufacturing jobs. So the whole transition as it takes place, working with our utility partners and also our construction partners as we transition that creates good valuable union jobs, blue collar jobs.

Mr. LEVIN. Terrific. Well, I was excited about that Ford F–150 Lightning announcement last night. Also, though, I don't think my wife's going to let me buy a new car any time soon. But when I do, it is going to be another union made electric car. So that was great.

I wanted to turn to planning for the siting of renewable energy projects, I heard some about this. And particularly on our public lands, I have been supportive of what they call Smart from the Start where we designate development zones that are best for certain renewables so that they don't conflict with other land uses. And I know that the Interior Department has engaged in this type of planning for transmission as well.

Ms. Apsey and Mr. Skelly, do you see value in this type of Smart from the Start planning for transmission? And if so, what are the best strategies to minimize impacts and conflicts caused by new transmission lines? And are they applicable to both public and private lands?

Whoever wants to go first.

Ms. APSEY. I am happy to jump in. Thank you for that question.

Yeah, absolutely. Look, I mean I think if we look at Michigan established about approximately 10 years ago, they took an approach through legislation that established identifying the areas in the state that had the highest wind potential. And then through legislation it essentially instructed the transmission providers to build the necessary transmission to harvest as much wind. This was sort of a renewable energy zone. Texas went through a similar process. It is a very successful effort, a very successful process.

You know, look, we know in this country, we know where the wind blows. We know where the sun shines. And so, as we talk about planning a transmission planning process first, this would be consistent I think with what you are suggesting. And that is, right now what we do is we build transmission to interconnect everywhere a generator may site, whether it is optimal or suboptimal.

It is sort of like the movie the Field of Dreams, sort of build it and they will come. If we build the transmission where we know the renewable potential is, those renewable developers will locate around the transmission line because the cost of the transmission for the way we ask generators to pay for it is prohibitive because the person who gets assigned the cost responsibility it just makes the project null and void.

So we would be big supporters, big proponents of sort of a transmission first approach based on where we know the resources in the country are located.

Mr. LEVIN. Mr. Skelly, with the time I have left, I along with many of my colleagues think that modernizing, expanding electric

grid ought to be a bipartisan subject where we find common ground. And I was just curious what your view is as an entrepreneur, who lives in Houston, Texas, on that?

Mr. SKELLY. Yeah. Well, I think at the state-level we have seen that it is a bipartisan issue. And you know, in Texas, we did the biggest expansion of the grid, originally initiated by Governor Perry and then followed through on Governor Abbott.

So it can be a bipartisan—or one party or the other does it. It doesn't even have to be bipartisan, both parties seem to do this. So I am confident we can get something done.

Mr. LEVIN. I am too, Mr. Skelly. Let's work together. Let's find common ground. Let's get it done.

Chair Castor, I yield back. Thank you.

Ms. CASTOR. Thank, Representative Levin.

Next we will go to Representative Armstrong.

You are recognized for 5 minutes.

Mr. ARMSTRONG. Thank you. I am just reading the LA Times and I think it is great that we get somewhere to this point, but the LA Times, a 94.5 percent figure was fleeting, lasting just 4 seconds and was specific to the state's main power grid which covered four-fifths of California, but doesn't include Los Angeles, Sacramento, and several other regions. So I think it is great, I think it is partial.

But I just, you know, we are talking about these Federal right-of-ways and I think that is a great idea. And as we are having an honest conversation about building out this infrastructure, it is essential to expanding and, modernizing the grid, we have to continue to talk about permitting. And I have brought this up in multiple hearings because it is at the core of many of the policy changes being talked about by both Democrats and Republicans.

And at the Federal level, we already have the Federal Permitting Improvement Steering Council that oversees the Federal permitting process and resolves conflicts. Unfortunately, the Council's authorization sunsets in the coming years.

Last Congress, I introduced a bill with Senator Portman and several Democratic Senators to eliminate and expand the process. I mean, and the reality is many of these energy projects—traditional energy projects or renewable projects—will never come to fruition unless we maintain a neutral permitting structure that is dependable, timely, and reasonable.

And we know this, as we continue to deploy this, we are going to have to talk about the existing rights of way, but—I am sorry—but we know we will need more land to distribute this generation.

So Ms. Fisher, how do we improve the permitting process to allow more rights-of-way? Because as things stand, we just simply don't have enough land available for distributed generation.

Ms. FISHER. Well, I think that you have identified—thank you for the question. I think that you have identified coordination among differing permitting authorities is really important, and extending that authority so that Council can continue to operate would be useful.

You know, Federal and state permitting processes need to work together well. States do have a lot of control over what is cited in them. And we believe bringing in state partners early into the dis-

cussion is really important. But, you know, it is looking at efficient ways to get multiuse out of pieces of land.

I will note that it is not incompatible with public lands to run transmission through it. And that transmission often comes with really large conservation easements that preserve and protect land. So I think there are lots of ways to look at multiuse.

Mr. ARMSTRONG. Well, I just want to piggyback off of that a little bit. One, I mean, when you are doing the state permitting, if it is not common carrier, right—like North Dakota is a state that does not allow eminent domain. Right? And so you are having those different transitions. But you talk about those—actually, we did obviously during the oil boom, we tried to get a lot of pipe and transmission in the ground in Western North Dakota. And my friends and colleagues in the industry asked us how we can do that? I say, go back in time and give the county easements, because on county roads in North Dakota private landowners own to the middle of the road.

But when you are talking about these conservation easements as we talk into the litigation as an ongoing issue that delays the deployment of transportation—I mean, this isn't unique to electrical transmission. This exists whether it is a highway, a pipeline, a high voltage line. How do we address—do you have some ideas of how we address that?

Ms. FISHER. People don't necessarily love living near infrastructure even when they benefit from it. That is a pervasive problem. I do think that you have identified some appropriate ways of looking at how we site a lot of infrastructure and run right-of-way to sort of minimize impacts. I think that could be really helpful.

And we have seen some of our members do that, for example, while they are deploying fiberoptic cable for their own uses, they are also using that to bring middle mile broadband to other customers who might not have access to that. So there are ways to piggyback. Our infrastructure can be used for a lot of other purposes. We do share a lot with the telecommunications industry for example.

Mr. ARMSTRONG. Well, I think one of the things we don't recognize enough is with multiple agencies often completing duplicative reviews, not only does take much more time, but it creates several different areas in which—as is often the case in a lot of these litigated cases, they don't care necessarily which permit you violate. They just care that you violated one of them or they have a case. So if we could get some of that streamlined to get rid of the duplicative processing, do you think we would also reduce some of the litigation?

Ms. FISHER. That would probably reduce some litigation. Thank you.

Mr. ARMSTRONG. And with that, I guess, Garret, I have 14 seconds if you want it or I will just yield back.

Ms. CASTOR. Thank you very much, Representative Armstrong. I think the other Democrats are hustling back from the votes. So we will go to Representative Crenshaw.

Welcome, you are recognized for 5 minutes.

Mr. CRENSHAW. Thank you. Thank you, Madam Chairwoman, for holding this important hearing.

I always want to preface everything we say we want to get to the same goal, a reduction in global carbon emissions. I want to get there in a smart way without destroying our economy. And I think the solutions we offer generally are a faster way to get there, to be perfectly honest. I want to actually follow up on what Mr. Armstrong was talking about.

Mr. Skelly, you authored a report on 22 transmission projects that are ready to go and even met with senior members of the administration to discuss building them. However, projects are on the shovel ready list have been on the list for a decade plus. How many of the 22 projects are active and have experienced more than 5 years of delay?

Mr. SKELLY. I would say yeah, they have been—well, the list is a new list so they haven't been on the same list, but they have been underway for at least a decade on average. Okay?

Mr. CRENSHAW. Yeah.

Mr. SKELLY. And there is a few reasons why they haven't moved forward. One is permitting delays. The other is failures in the cost allocation process that we talked about a little while ago. And that is, in other words, a failure to consider all the benefits of the transmission. And the other is a failure of the system to basically reward some of the merchant developers for the additional services that they provide so.

Mr. CRENSHAW. And one of the things we see of course is weaponization of the court system. I mean, talking about Cardinal-Hickory Creek, maybe I will move to Ms. Apsey for this since you all are in charge of this one. Why is that facing delays? Is it eminent domain, permitting, financing, political will, or is it mired in lawsuits?

Ms. APSEY. Yeah. It is facing delay based on pending litigation, which is essentially an appeal, parties who are opposed to the project are appealing the process by which it went through for several years.

Mr. CRENSHAW. And do you think that these transmission projects are going to face similar litigation, and that would be a barrier to rolling out new transmission, especially well over 120 percent additional new transmission, which is what our fellows at Princeton seem to believe would be necessary to meet our goals?

Ms. APSEY. Yeah. There certainly is a history of many major transmission projects being delayed through litigation, you know. And obviously, as we have talked about before, I mean, time. Time is of the essence if we want to realize the benefits both in terms of integrating renewables, the reliability, the resiliency benefits. And so time is of the essence. And these projects in and of themselves, even when everything goes as planned and well, can take anywhere from 7 to 10 years to realize.

Mr. CRENSHAW. Which is far too long. And look, this is the broader point I am trying to make here, step two is paying for this stuff and building it. Step one is actually allowing ourselves to build it. If we don't address the permitting issues in this country, which are far more stringent than most developed nations, we are never going to get to the part where we build 120 percent more transmission lines in America. We are never going to get to that point. There is no point in allocating around $3 trillion to do this if it is just

going to be weaponized by the courts and weaponized by environmental groups.

So I would ask my colleagues on the other side of the aisle to consider this, the clean energy goals are directly in conflict with the environmental groups as well because they are the ones who sue and settle. The law has to be changed. There is a lot of examples of this.

In 2011, President Obama created the Rapid Response Team for Transmission to speed the permitting of five Western transmission line projects. Only one is under construction so far. Only one. The law needs to be changed. The proposed 300 mile electricity line to deliver renewable electricity from Idaho to Oregon commenced permitting in 2010. Federal agencies can't find a way forward on more than 30 Federal and 50 state and local permitting actions, and another 100 water crossing approvals.

Then I want to get to another broader point which is, is this even the right approach to try and build—build massive amounts and take up massive amounts of land for wind and solar in places where the sun shines, and in places where the wind blows, build out massive amounts of infrastructure and transmission lines, to get that to where we need it? Is that really even the right approach? Maybe we should rethink this.

We could build, for that amount of money, countless nuclear plants. A nuclear plant, by the way, operates on a 1,000 acres versus the same power of a solar farm that operates on a 100,000 acres. And the nuclear plant doesn't rely on weather. Guys, you know, I want us to rethink how we approach the problem that we all want to solve.

Thank you I yield back.

Ms. CASTOR. Thank you, Representative Crenshaw.

Next we will go to Representative Casten and then we will go into a recess for 15 minutes.

Representative Casten, you are recognized.

Mr. CASTEN. Thank you, Madam Chair. Thank you to all our members.

Mr. Skelly, it is a pleasure to see you, one former energy developer to a current one. As I have long maintained, no one really understands the financial, the regulatory, all of the barriers to building projects like someone who has been in the trenches as long as you have.

Americans for a Clean Energy Grid reported that as of 2019, there was 734 gigawatts, basically 73 percent of our entire grid, stuck in interconnection queues, mostly waiting for debates over who is going to be responsible for paying for the transmission upgrades. In the meantime, in Illinois where I live, the SOO Green Project, that is a HVDC, no generation associated with it, would bring cheap, renewable energy from Ohio into Chicago markets to ease congestion, is hung up in generator interconnection queues.

Last month, I introduced a bill with Senator Heinrich that would require FERC to issue a rulemaking on interregional transmission that would explicitly recognize the benefit of low CO_2 sources and bring them online quicker.

But what I wonder, Mr. Skelly, is if that is enough. We have got this problem, that I don't think any of you have addressed, but I

want to give you a chance to talk about it, given some of your history.

We have a real problem in ISO/RTO governance. The governance structures of those organizations is often dictated by members who have—and they have the best of intentions, but as you know well, they have got a vested economic interest, sometimes, in maintaining congested and high prices in their region, which is precisely the problem that these projects we are talking about would alleviate.

Can you just speak a little bit from your experience about some of the issues with ISO/RTO governance. And if you were king tomorrow, do you have any easy fixes that would still recognize their critical need and recognize the expertise of their members but get rid of some of the conflicts of interest?

Mr. SKELLY. Yeah. I mean, having suffered personally at the hands of a generator who didn't want us to interconnect on a number of occasions, it really is an issue. And this does feel like an area of ripe for FERC action and restructuring the governance of the RTOs to accommodate more entrants, okay, which is really what we are talking about. We are talking about enhancing competition by permitting more folks to enter the process.

I think it would be very helpful. And Texas has I think has a great example of that. The interconnection process is very straightforward. It is fast. You get quick results. You are then in the interview market and you are kind of on your own, whether or not you are going to make money. But it is a process that has proven gets a lot of generation online quickly.

Mr. CASTEN. I would love for you to comment on this, Ms. Fisher. I mean, a lot of the people who are in those governance decisions are your members, you know. Would you agree with the issue as I framed it? And to the extent that you can, what do you think it would take to get some of your members to really advocate for the changes necessary to essentially do something that may be, you know, against their short-term economic interests?

Ms. FISHER. Thank you very much for the question, Representative. I might not fully agree that people enjoy keeping congestion functioning for the purpose of increasing prices. But I think everyone agrees that ISO/RTO governance hinders progress and makes it difficult for people to make decisions within those structures quickly and in a timeframe that is consistent with the problems we are trying to solve.

I think everyone is concerned about generator interconnection queues and how long they are, and how potentially inefficient those processes are, and to look forward to FERC working with the governance of those entities to figure out how do you move things through that queue more quickly, how to allocate costs for generators who are trying to interconnect more quickly.

I don't think anyone thinks that those processes are efficient as they need to be. Despite the literally sometimes thousands and thousands of people who participate in them.

Mr. CASTEN. Okay. Well, I am getting near the end of my time, but I would welcome any of your thoughts on legislatively—I think it's very easy for us all in this body to punt to FERC, but since we are waiting 20 years on some of these things, I take your comments, Ms. Apsey, that Order 1000 wasn't perfect. But the core is

the same issue. Right? There is just these conflicts of interests between groups, especially when we get to regional connections.

And I guess I would just remind everybody, including my friend Mr. Crenshaw, that it is comparatively really easy to permit gas pipelines in this country. We have made it chronically difficult to permit transmission. And a big part of that is the governance structure, a big part of that is the failure to have a single point of control on these projects.

And I welcome all of your thoughts on what we might do legislatively to move that a little bit faster than the snail's pace it has moved in the last 30 years.

Thank you and I yield back.

Ms. CASTOR. Thank you, Representative Casten. So we will reconvene the committee immediately after the second vote. So we stand in recess until that time.

[Recess.]

Ms. CASTOR. The committee will come to order. Thank you for bearing with us during votes on the floor.

Next we will go to Representative Gonzalez. You are recognized for 5 minutes.

Mr. GONZALEZ. Thank you, Madam Chair. And thank you to our witnesses, our panel. The good news is I do think we have found one area where there is bipartisan agreement with respect to the need to modernize our grid. The how and why is always sort of the challenge, but we are certainly in agreement on that, and the events over the last year have played out to prove that case.

I would like to associate myself with Congressman Graves's comments with respect to the cost. And then I always like to see my friend, Dan Crenshaw on, who centers us in reality. And I would like to start with something that I think will hopefully do the same.

So the hearing opened with alluding to the terrible storms that are taking place in the southeast and obviously our heart goes out to everyone affected. So I went to NOAA's website and found the global warming and hurricanes overview of current research results here. And I want to read a statement, because I think it is important. We are getting to a point where any time a bad storm happens we blame climate change. And I will just read their summary.

In summary, neither our model projections for the 21st century nor our analyses of trends in Atlantic hurricanes and tropical storm activity support the notion that greenhouse gas induced warming leads to large increases in either tropical storm or overall hurricane numbers in the Atlantic.

While one of our modeling studies projects a large increase in Atlantic Cat 4 and 5 hurricanes over the 21st century, we estimate that such an increase would not be detectable until the latter half of the century. And we still have only a low confidence that such an increase will occur in the Atlantic basin.

And of course it is also true that deaths from natural disasters globally over the last 100 years are down 92 percent, which is great. And then finally—and I think we have been talking about California as if it is an example of how we want our energy to exist broadly across the country. Again some data between 2011 and

2020, electricity prices in California rose seven times more than they did in the rest of the country. And at the same time, carbon emissions rose 4.1 percent in California, even as they declined 3.5 percent in the average over the remaining 49 states.

So not something I want for Ohio. And I think we need to be smart about how we move forward. Focus on the things we agree on, but also fund the basic research that is necessary to invent our way out of what is certainly a challenge with respect to climate change and making sure that we do it in a smart, a smart way, that is affordable and lasting.

So I want to start with Ms. Fisher. As I am sure you are well aware, Congress is currently debating and negotiating an infrastructure package that largely hinges on the question, how do you pay for it? If we are going to modernize and decarbonize the grid, we are going to have to attract more private capital. I think that is obvious.

What sort of policies should we be pursuing to make these energy investments more attractive to private investors in your estimation?

Ms. FISHER. Thank you very much for the question. My member companies are terrific at raising capital. As I mentioned, before we are the most capital intensive industry in the United States. And over the last 10 years, we have spent $1 trillion on grid modernization and related efforts. So what usually industry says remains true here. Some regulatory certainty and some clear direction usually helps us to attract capital and deploy it efficiently.

Mr. GONZALEZ. Great.

And then Mr. Skelly, in your testimony you stated that if there were greater Federal investment, we would be able to carry out 22 high voltage transmission projects and increase solar and wind generation by 50 percent. Can you explain the impact that this would have on energy use? Because there is an important distinction between production and use. And obviously while the sun and wind are good energy sources, we still don't have reliable and widely useable ways to store the energy for days, weeks, or months.

So how would this project solve that storage challenge, which I think is also a unique challenge?

Mr. SKELLY. So with electricity, because consumption and production are instantaneous, storage as you point out is important. And there are some interesting advances. I am on the board of a company called Form Energy and we are working hard at multiday storage and making good progress.

The other way to think about it is with transmission, you can move energy around the country. And that actually can reduce some of the need for storage, because as we all know, the wind and sunshine are variable across the country. And moving energy in time as you point out is important, but also moving it in space can be just or even more helpful in doing so.

Mr. GONZALEZ. That also carries substantial cost. Right? If we are going to take Arizona sunshine and push it to call it Oklahoma, that is going to require some challenges.

I see I am out of time. Sorry for that, but with that, I yield back. Thank you.

Ms. CASTOR. Thank you.

Representative Bonamici, you are recognized for 5 minutes.

Ms. BONAMICI. Thank you so much, Chair Castor and Ranking Member Graves. And thank you to our witnesses.

We know addressing the climate crisis and also strengthening investments in our electric grid will create millions of good paying, high quality jobs. And that can help especially displaced workers recover from the economic collapse that has been caused by the COVID–19 pandemic.

Last fall I had a great visit with apprentices out at the IBEW Local 48 in Portland. They have a partnership out there with NECA, the National Electrical Contractors Association. IBEW's electrical apprenticeship program demonstrates how our transition to a clean energy economy can provide this extraordinary opportunity to provide good paying jobs. The program is also an excellent example of why we need to protect and strengthening our registered apprenticeship system. And I am glad the House updated the apprenticeship bill, the first one since the 1930s.

So I am one of the leaders on the Education and Labor Committee so I know we also have an obligation to address those critical failures and make sure that Federal clean energy investments uphold labor standards like Buy American, Davis-Bacon prevailing wage, use of community benefit agreements, project labor agreements. They all make a difference.

So Mr. Colston, in your testimony, you noted that IBEW anticipates the need for at least 50,000 new linemen over the next 10 years. So how can Congress better support IBEW's efforts in both training the next generation, but also making—getting more workers, the workers that we need to help us [inaudible] in our clean energy transition?

Mr. COLSTON. We at IBEW itself we have more than 300 training centers throughout the United States; in almost all communities, we have a training center there. We partner with our partner utilities on training those linemen. We also partner with our contractors on training those linemen. And when the work is there, that allows us to take in additional IBEW apprentices.

The apprenticeship program at the IBEW is unique as in the other skilled trades, as not only do we give you an education, but we are going to give you a job to put those practical skills to work at the exact same time, so they will go hand in hand.

The way that Congress can help us is as more transmission lines are approved and actually get up and running and building, that puts more of our members to work. As we modernize the grid on the distribution system or even the downtown network system, as we modernize that, that technology allows our utility partners to add additional workforce to theirs too. So as a permitting and citing permits come into play as we determine where they are going and we can actually build for the future and not just building a transmission line that is just going to meet today's needs. We have the ability to bring on the workforce to do that as they are coming on.

Ms. BONAMICI. Mr. Colston, I don't want to cut you off, but you mentioned citing and I want to get in another question.

So Mr. Skelly, when the Select Committee developed our climate action plan, we heard about the challenges of citing interstate

transmission lines and overcoming those challenges was going to be key to improving resilience on the grid.

So how will the Department of Transportation's recent guidance on using existing rights of way for transmission lines help address some of those challenges?

And also, if Ms. Apsey can weight in, as Congress considers the American Jobs Plan, a once-in-a-generation comprehensive infrastructure package, what further Federal investments can help?

So Mr. Skelly and then maybe we can get a little bit from Ms. Apsey.

Mr. SKELLY. Yeah. So I would say that on using existing rights of way, this is a fairly common practice. One when you are developing transmission lines, you try to use existing corridors or you follow pipelines, or railroads, or other existing infrastructure in order to minimize disturbance.

What I think the guidance that was recently issued speaks to and it is incredibly important is that initiatives like this sort of raise the level of leadership around transmission. And those of us who have been doing this work for a long time are really heartened by the emphasis across the government, you all, the administration and so on, on what do we need to do to facilitate this infrastructure expansion.

So that is maybe the most important element of the guidance that is coming out of DOT.

Ms. BONAMICI. That is really helpful.

Ms. Apsey. Oh, gosh. Sorry. The clock ticked down, but do you have, like, one or two words on what further Federal investments can help the policies?

Ms. APSEY. Yes, certainly. And again, just going back to accelerating timelines and bringing stakeholders together so that we can get the certainty that we need to move forward with this investment. Time is of the essence.

Ms. BONAMICI. Great. Thank you so much.

I yield back. Thank you, Madam Chair.

Ms. CASTOR. Thank you, Representative Bonamici.

Well, I want to thank our witnesses for being with us today, for staying with us through votes on the floor of the House. You certainly have given us as an impetus to work in a bipartisan way to modernize America's electrical grid and expand clean energy. So thank you all.

Without objection, I have a few things to enter into the record. First, the introduction from the April 2021 report by Americans for a Clean Energy Grid, titled Transmission Projects Ready to Go: Plugging Into America's Untapped Renewable Resources.

The introduction from the May 2021 report by the American Council on Renewable Energy, titled Investment Tax Credit for Regionally Significant Electricity Transmission Lines.

A May 20 letter from the American Council on Renewable Energy supporting investments in policies to upgrade and expand the electric grid.

And a May 20, letter from the Solar Energy Industries Association supporting transmission investments to help achieve 100 percent clean electricity.

[The information follows:]

Submissions for the Record

Representative Kathy Castor
Select Committee on the Climate Crisis

May 20, 2021

ATTACHMENT: Goggin, M., Gramlich, R., & Skelly, M. (2021 April). *Transmission Projects Ready to Go: Plugging into America's Untapped Renewable Resources*. Americans for a Clean Energy Grid.

The report is retained in the committee files and available at:
https://cleanenergygrid.org/wp-content/uploads/2019/04/Transmission-Projects-Ready-to-Go-Final.pdf

ATTACHMENT: Goggin, M. and Gramlich, R. (2021 May). *Investment Tax Credit for Regionally Significant Electricity Transmission Lines: A Description and Analysis*. American Council on Renewable Energy.

The report is retained in the committee files and available at:
https://acore.org/wp-content/uploads/2021/05/Investment-Tax-Credit-for-Regionally-Significant-Electricity-Transmission-Lines-ACORE.pdf

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ACORE

American Council on Renewable Energy

The Honorable Kathy Castor
Chair
U.S. House Select Committee on the Climate Crisis
H2–359 Ford House Office Building
Washington D.C. 20515

The Honorable Garret Graves
Ranking Member
U.S. House Select Committee on the Climate Crisis
H2–359 Ford House Office Building
Washington D.C. 20515

Dear Chair Castor, Ranking Member Graves and Members of the Committee:

The American Council on Renewable Energy (ACORE) appreciates the opportunity to submit a letter for the record to the House Select Committee on the Climate Crisis's May 20, 2021 hearing entitled, "Powering Up Clean Energy: Investments to Modernize and Expand the Electric Grid." ACORE works across renewable technologies and represents the nation's leading renewable energy developers, manufacturers and investors, along with corporate electricity consumers, electric utilities, manufacturers of energy storage and smart grid technologies, and the many other diverse industries that comprise the country's thriving renewable energy economy. Renewable energy and enabling grid technologies attracted over $68 billion in private sector investment in 2019, and our members are proud of renewable energy's contribution to American economic growth, job creation and greenhouse gas (GHG) emissions reductions.[1]

Initiatives to expand transmission lines and related enabling infrastructure (including energy storage) play a critical role as part of comprehensive climate recommendations and are an indispensable feature of any plan to address the climate crisis by reducing GHG emissions. The 15 states between the Rockies and the Mississippi River account for 88% of the country's wind technical potential and 56% of the country's utility-scale solar technical potential but account for only 30% of projected electricity demand by 2050. These resources cannot be developed without a plan for building interregional transmission that can deliver power to high-density population centers. A nationwide, high-voltage direct current (HVDC) network, opti-

[1] American Council on Renewable Energy, *Expectations for Renewable Energy Finance in 2020–2023*, 2020. Accessed May 13, 2021 from https://acore.org/wp-content/uploads/2020/07/Expectations-for-Renewable-Energy-Finance-in-2020-2023.pdf.

mized for the nation's best wind and solar resources, could reduce carbon dioxide emissions from the U.S. electricity sector by up to 80% relative to 1990 levels without an increase in the levelized cost of electricity. Such a network would enable the U.S. to generate 60% of its electricity using wind and solar resources alone.[2]

Grid expansion will also drive economic recovery and job creation. A recent report from Americans for a Clean Energy Grid identified 22 shovel-ready, high-voltage transmission projects across the country that would create approximately 1,240,000 family-sustaining jobs and enable 60,000 megawatts (MW) of new renewable energy capacity, increasing America's wind and solar generation by nearly 50 percent.[3]

A recent ACORE report detailed the growing consensus that transmission provides large net benefits to electricity consumers.[4] Transmission provides consumers access to lower-cost forms of electricity generation, including high-quality renewable energy resources. This report joins dozens of studies from grid operators, national laboratories, and others that have found transmission investment provides consumers with benefits several times greater than its cost. The Southwest Power Pool (SPP) has already realized significant benefits from recent transmission investments, with benefits expected to exceed costs by a factor of 3.5 over the new lines' first 40 years.[5] The Midcontinent Independent System Operator (MISO) has also found that its Multi-Value Projects offer a benefit-to-cost ratio of between 2.2 and 3.4.[6] Similarly, the National Renewable Energy Laboratory Interconnections (NREL) Seam study found benefit-to-cost ratios of between 1.8 to 2.9 for various transmission configurations.[7]

The tragic power outages in Texas and other parts of the Central U.S. in February of this year also underscore the importance of transmission to electric reliability and resilience. The ERCOT grid has limited ties to neighboring regions, so it was not able to import as much electricity as other regions when hit with natural gas supply interruptions, generator outages, and high demand in the face of extreme weather. In contrast, stronger transmission ties between the regions of SPP and MISO allowed those regions to weather the storm with less severe power outages, as they were able to import more than 15 times as much power as ERCOT.[8]

We respectfully *submit* the following policy recommendations for upgrading and expanding the nation's electric grid to create jobs and enhance reliability while deploying higher levels of renewable energy and protecting public health: 1) Establishing an Investment Tax Credit (ITC) for regionally significant transmission projects; 2) Improving transmission planning and cost allocation processes; 3) Resolving interconnection backlogs by assigning costs of network upgrades more equitably; 4) Providing funding and technical assistance to states, tribes, and localities to site transmission lines; and 5) Establishing a national policy on transmission.

I. Establish an Investment Tax Credit for Regionally Significant Transmission Projects

Increased investment in transmission infrastructure expands access to, and delivery of, renewable energy resources. Recent studies from Princeton, MIT, and others have found that significant transmission expansion is needed to deliver the lowest-cost renewable energy to market in a time frame compatible with U.S. clean energy

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[2] Macro Grid Initiative, *Transmission & Climate Change*, 2021. Accessed May 13, 2021 from https://acore.org/wp-content/uploads/2020/12/Macro-Grid-Initiative-Transmission-and-Climate-Change-Fact-Sheet.pdf.

[3] Americans for a Clean Energy Grid, *Transmission Projects Ready to Go: Plugging Into America's Untapped Renewable Resources*, 2021. Accessed May 17, 2021 from https://cleanenergygrid.org/wp-content/uploads/2019/04/Transmission-Projects-Ready-to-Go-Final.pdf.

[4] American Council on Renewable Energy, *Investment Tax Credit for Regionally Significant Electricity Transmission Lines*, 2021. Accessed May 17, 2021 from https://acore.org/wp-content/uploads/2021/05/Investment-Tax-Credit-for-Regionally-Significant-Electricity-Transmission-Lines-ACORE.pdf#page=8.

[5] Southwest Power Pool, *The Value of Transmission*, 2016. Accessed May 14, 2021 from https://www.spp.org/documents/35297/the%20value%20of%20transmission%20report.pdf.

[6] Midcontinent Independent System Operator, *MTEP17 MVP Triennial Review*, 2017. Accessed May 14, 2021 from https://cdn.misoenergy.org/MTEP17%20MVP%20Triennial%20Review%20Report117065.pdf.

[7] National Renewable Energy Laboratory, *Interconnections Seam Study*, 2020. Accessed May 14, 2021 from https://www.nrel.gov/docs/fy21osti/78161.pdf.

[8] American Council on Renewable Energy, *Investment Tax Credit for Regionally Significant Electricity Transmission Lines*. Accessed May 17, 2021.

goals.[9, 10] Despite this, necessary investments in transmission infrastructure do not receive the same policy support as generation resources.

Congress should enhance the financial viability of regionally significant transmission projects through enactment of an investment tax credit. Enactment of a transmission investment tax credit (TxTC), as contemplated on page 56 of the Committee's June 2020 *Solving the Climate Crisis* Majority Staff Report, would provide developers with the investment certainty they need through a predictable, multi-year investment structure, all while saving ratepayers money and lowering the upfront construction costs of transmission too often undervalued relative to its economic development, job creation, reliability and environmental benefits.

In March 2021, President Biden called for the creation of a TxTC in the American Jobs Plan, urging "the creation of a targeted investment tax credit that incentivizes the buildout of at least 20 gigawatts of high-voltage capacity power lines."[11] In April 2021, Rep. Steven Horsford, Rep. Susie Lee and Sen. Martin Heinrich followed suit by reintroducing the Electric Power Infrastructure Improvement Act (H.R. 2406/S. 1016). This legislation would promote construction of regionally significant projects by providing a 30% tax credit for investment in qualifying electric transmission, defined as any overhead, submarine, or underground transmission facility with a voltage of at least 275 kV and a transmission capacity of at least 500 MW. The tax credit would apply to properties placed in service before December 31, 2031. Later that month, Sen. Ron Wyden reintroduced the Clean Energy for America Act (S. 1298), which includes a 30% TxTC for high-capacity transmission lines with a minimum voltage of 275 kV. Importantly, the Wyden proposal also would provide a direct pay option for the TxTC to ensure access by the broadest universe of stakeholders.

II. Improve Transmission Planning and Cost Allocation to Build More Regionally Significant and Interregional Projects

FERC Order No. 1000 governs the regional and interregional transmission planning process for cost-allocated projects. In the ten years since FERC promulgated Order No. 1000, not one interregional transmission line has been built using the process it established. With more regionally significant and interregional transmission, we can connect centers of high renewable resources with centers of high electric demand, enhancing grid reliability and dramatically reducing carbon emissions.

Implementation efforts too often do not incorporate projections of the cleaner resource mix we need to build or allow for the use of advanced technologies and grid optimization methods that could benefit the build-out of clean energy resources by increasing capacity at lower cost. These efforts also employ procedures that disincentivize transmission interconnection and ignore benefits such as lowered delivered energy costs through new renewable integration. Additionally, FERC Order No. 1000 requires interregional projects to be separately selected in the planning process for each RTO plus a joint RTO planning process. Projects which do not have clear benefits within a single RTO may not be selected in that RTO's planning process despite benefiting the nation as a whole. This is known as the "triple hurdle" problem of interregional transmission planning.

Congress should direct FERC to revise Order No. 1000 to produce a more robust and efficient transmission system. This can be accomplished by requiring planning processes to consider the full range of benefits, plan for future needs, utilize more standard and broad cost allocation in light of regional benefits, harmonize cross-region planning processes and incorporate advanced technologies and grid optimization.

Commonsense transmission planning reform was contemplated on page 55 of the Committee's June 2020 *Solving the Climate Crisis* Majority Staff Report.

In March 2021, Rep. Frank Pallone, Rep. Paul Tonko, and Rep. Bobby Rush introduced the Climate Leadership and Environmental Action for our Nation's (CLEAN) Future Act (H.R. 1512). Section 217 of the legislation directs FERC to convene a technical conference to explore, among other things, how transmission providers can

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[9] Princeton University, *Net-Zero America: Potential Pathways, Infrastructure, and Impacts*, 2020. Accessed May 19, 2021 from https://netzeroamerica.princeton.edu/img/Princeton_NZA_Interim_Report_15_Dec_2020_FINAL.pdf.

[10] Brown, Patrick and Botterud, Audun, *The Value of Inter-Regional Coordination and Transmission in Decarbonizing the US Electricity System*, 2021. Accessed May 19, 2021 from https://www.sciencedirect.com/science/article/abs/pii/S2542435120305572?dgcid=author.

[11] The White House, *Fact Sheet: The American Jobs Plan*, 2021. Accessed May 18, 2021 from https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/.

plan for interregional transmission projects, how interregional transmission planning can facilitate the integration of renewable energy resources, and how to develop appropriate cost allocation methodologies for interregional transmission projects. The legislation also directs FERC to promulgate a rule addressing the issues identified in the technical conference.

In April 2021, Rep. Sean Casten and Sen. Martin Heinrich introduced the Interregional Transmission Planning Improvement Act of 2021 (H.R. 2678/S. 1015) to help bolster the Federal Energy Regulatory Commission's interregional transmission planning process. The legislation would direct FERC to consider in its rulemaking the effectiveness of the existing interregional planning process, specific improvement to the process that would meet the stated goals of Order 1000, and cost allocation methodologies that reflect the multiple benefits provided by interregional solutions. The bill would also direct FERC to initiate the rulemaking within six months of enactment and complete a final rule within 18 months of enactment.

III. Resolve Interconnection Backlogs to Deploy More Clean Energy

When a new clean energy generator wants to connect to a congested grid, they are often required to pay the full—or nearly the full—cost of the upgrades necessary to do so, even though many existing customers on the grid benefit from the upgrade. This process is analogous to the next car entering a crowded highway paying for the full cost of a lane expansion. At the end of 2019, as a result of broken interconnection policy, 734 gigawatts of proposed generation—90 percent of which are new wind, solar, and storage projects—were waiting in interconnection queues nationwide.[12] These disproportionately high interconnection costs are forcing developers to shelve otherwise economic solar and wind projects. To deploy this clean energy, **Congress should direct FERC to assign these costs to the beneficiaries of the upgrades.**

Page 54 of the Committee's June 2020 *Solving the Climate Crisis* Majority Staff Report recommends that Congress direct FERC to end its policy of assigning costs of the regional network to individual interconnecting generators and instead incorporate such needs into the regional transmission planning and cost allocation processes.

IV. Provide Funding and Technical Assistance to Help State, Local and Tribal Authorities Site Interstate Electric Transmission Lines

In many instances, state, local and tribal governments do not have the resources to conduct the economic and environmental analysis required to site and permit interstate transmission lines that pass through their jurisdictions, often leading to lengthy delays. Siting transmission in a just and environmentally responsible manner is vital to building a 21st century grid. **Congress can help ensure that critically important state, local and tribal voices are represented in the discussion by providing targeted assistance in the siting process.**

Page 52 of the Committee's *Solving the Climate Crisis* Majority Staff Report recommends that Congress create a new program at DOE to provide federal funding and technical assistance for state, local, and tribal authorities to conduct transmission planning and review applications to site proposed interstate transmission projects. It also recommends that Congress should authorize DOE to provide incentives for economic development to these state, local, and tribal jurisdictions.

Section 218 of the CLEAN Future Act (H.R. 1512) would require DOE to establish a program to provide assistance to state, local, and tribal governments for the evaluation, permitting, and siting of interstate transmission lines. The legislation authorizes $75 million per fiscal year from 2022–2031.

V. Establish a National Policy on Transmission to Guide a 21st Century Grid

Congress should establish a National Policy on Transmission to integrate carbon-free resources in a timely and cost-effective manner. Our national transmission system is the largest single machine in America, if not the largest in history. Nevertheless, there is no federal direction on how to make this machine work more efficiently on behalf of the nation. This task that has taken on all the more importance as we work to decarbonize the grid in a cost-effective manner.

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[12] Americans for a Clean Energy Grid, *Disconnected: The Need for A New Generator Interconnection Policy,* 2021. Accessed May 18, 2021 from https://cleanenergygrid.org/wp-content/uploads/2021/01/Disconnected-The-Need-for-a-New-Generator-Interconnection-Policy-1.14.21.pdf.

Page 53 of the Committee's *Solving the Climate Crisis* Majority Staff Report recommends that Congress should establish a "National Transmission Policy" to provide guidance to state and local officials and reviewing courts to clarify that it is in the public interest to expand transmission to facilitate a decarbonized electricity supply and enable greenhouse gas emissions reductions. It recommends that the policy statement should also encourage broad allocation of costs.

Section 211 of the CLEAN Future Act (H.R. 1512) would establish that it is the policy of the United States that a modern transmission system should facilitate a decarbonized electricity supply to enable GHG emissions reductions, and that the public interest is served by reducing barriers to transmission investments that enable clean energy resources deployment.

Conclusion

Through this suite of commonsense policy solutions, all previously endorsed in the Committee's June 2020 *Solving the Climate Crisis* Majority Staff Report, we will be well prepared to modernize and expand our nation's electric grid to drive continued economic growth for decades to come while maintaining solid electric reliability and meeting our climate challenge. We stand ready to discuss any and all of these issues in greater detail at any time. Please let us know if we can provide any additional information by contacting Bill Parsons, Chief Operating Officer, at (202) 777–7596 or parsons@acore.org.

Sincerely,

Gregory Wetstone
President & CEO
American Council on Renewable Energy

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SEIA

Solar Energy Industries Association

May 20, 2021

Chairwoman Kathy Castor
House Select Committee on Climate Crisis
H2–359 Ford House Office Building
Washington, DC 20515

RE: POWERING UP CLEAN ENERGY: INVESTMENTS TO MODERNIZE AND EXPAND THE ELECTRIC GRID

Dear Chairwoman Castor,

On behalf of the Solar Energy Industries Association (SEIA), I first want to thank you for your leadership on behalf of the American people and the aggressive work you have already undertaken during the beginning days of this 117th Congress to get us on a trajectory to a 100% clean energy economy by 2050. As the House Select Committee on Climate Crisis discusses policy solutions at a hearing titled *"Powering Up Clean Energy: Investments to Modernize and Expand the Electric Grid,"* I wanted to give you some specific details on how the solar+storage industry continues to work aggressively towards your goals and President Biden's goal of a 100% clean energy future, which the nation so desperately needs and deserves.

SEIA has set a goal of solar+storage energy comprising 20% of the U.S. electricity mix by 2030. We have denominated the upcoming 10 years as the "Solar+ Decade" to represent not just the immense amount of solar and energy storage that must be deployed for the U.S. to reach both the committee's goal and those stated in the Intergovernmental Panel on Climate Change (IPCC) goal for climate mitigation. If we achieve this goal, the solar industry will have generated hundreds of billions of dollars in investment and created hundreds of thousands of American jobs.

First, we want to commend you for advancing the Transmission Siting Assistance Program and the Interconnection Cost Allocation Bill. These bills advance exactly the kind of policy needed to meet our clean energy future.

As this Congress progresses towards a clean energy future, investment in infrastructure, particularly transmission, will be paramount to achieving America's path to 100% clean electricity. In its 2021 Infrastructure report card, the American Society of Civil Engineers gives the U.S. a grade of "C–" for its energy infrastructure. We continue to under-invest in our grid, and that costs customers, both in terms of dollars paid for electricity (more transmission reduces congestion, allowing access to cheaper generation) and wages/economic output lost due to outages. Additional transmission investment could save customers $50 billion annually and reduce elec-

tricity bills by 10%.[1] Transmission investments often provide benefits two to four times greater than their costs. As we transition to a renewable-based electric system, transmission is needed to access renewable resources and deliver clean solar power to customers. And we need to replace aging infrastructure and build new grid infrastructure that meets the needs of our electrifying economy.

The Federal Energy Regulatory Commission's (FERC) Order No. 1000 did not achieve the goals of smoother inter-regional transmission planning and opportunities for competitively built transmission, in part because it required states to commit to paying for proposed projects before it could be approved. Some states do not have clear mechanisms through which to do this, and cost-sharing between states on what was public purpose, what was reliability, and what was market efficiency were not easily resolved.

In general, SEIA believes that competition has the dual benefits of lowering costs and increasing innovation. FERC, state policymakers, and planning regions should revisit Order No. 1000 to see if modifications are warranted to better attain its goals. Even better, Congress should provide the necessary incentives and policies necessary to encourage FERC, states, public utilities, and wholesale markets to drive needed transmission investment.

In many areas, transmission upgrades will be needed to interconnect new renewable generation, a challenge which every solar and storage developer faces. Solar projects can often be sited relatively close to population centers, making interconnection and localized transmission critical to scaling solar deployment.

Interconnection is the act of mechanically connecting a distributed generation project (solar, energy storage, wind) to the local distribution electric grid. Interconnection can require electrical improvements to existing infrastructure or require construction of brand-new facilities. Such upgrades range in complexity from erecting new poles and wires to replacing an area substation or even upgrading transmission equipment.

Utilities typically charge solar developers the full cost to upgrade their systems to accommodate the new generation source. Interconnection rules define how a generation system, such as solar photovoltaics (PVs), can connect to the grid. In some areas of the United States, the interconnection process lacks consistent parameters and procedures for connecting to the grid or is unnecessarily complex. This drives up costs and causes delays, which can be significant barriers to project development. The ability to interconnect to the grid in a cost-effective and timely manner may determine whether a project moves forward or not.

Beyond interconnection, the replacement of aging transmission assets coupled with transmission expansion to strengthen the grid and decrease congestion will be big drivers of new transmission investment. But we also need to focus on the effects of regional transmission planning. As of today, for SEIA's goal for solar+storage to power 20% of the nation's electricity needs by 2030, no wholesale market in this country has run a transmission planning scenario that puts solar generation at 20% of their anticipated load in the next decade—except for California. With this lack of foresight, we will always be behind on our transmission investments.

Further, state renewable energy portfolio (RPS) policies vary in their implementation—some have higher in-state requirements, some allow wholesale market wide renewable energy credits, so the impact on transmission is a function of how the policies are designed and not simply the headline renewable requirement.

There are transmission success stories. Texas's Competitive Renewable Energy Zone (CREZ) and MISO's Multi-Value Projects (MVPs) were successfully planned and have built transmission to interconnect expected areas of renewable energy build-out (primarily wind). However, these success stories are few and far between and we cannot rely on existing policy to deliver the investment that we will need to meet the climate crisis. In order to achieve deep decarbonization, we need policymaker commitment to transmission and solutions to cost allocation, along with new incentives for renewable generation.

We have an opportunity unlike ever before to plan the transmission build-out for what the next 100 years will look like. Transmission Planners need to take into consideration the growth in renewables (20% or more for solar), the need for distributed solar, storage, and other technologies too. We must not also forget that as the transportation sector is further electrified, grid planners need to anticipate consumers using electricity to power their vehicles, both at home and at distinct infrastructure points like the communal charging stations which will take automation of building systems and greater electrification of the economy overall. While no one can predict

[1] *WIRES Report: Well-Planned Electric Transmission Saves Customer Costs: Improved Transmission Planning is Key to the Transition to a Carbon-Constrained Future.* The Brattle Group, Johannes Pfeifenberger and Judy Chang (June 2016).

the future with accuracy, being visionary as we approach transmission investment will yield better outcomes.

Lastly, we must address the important need for energy storage. When combined with other technologies, energy storage systems add value to the total system. Distributed energy systems with energy storage extend grid reliability to both sides of the meter. Paired with renewable energy generation, the technology makes the renewable electricity dispatchable and able to be used with demand management systems to shift peak loads. Energy storage, when merged with aging infrastructure, improves performance, and extends the service life of equipment.

Battery storage will also empower the grid in multitude of ways; similar to a Swiss Army knife, it can offer solutions depending on the need. It is important to not box storage into a category of transmission or generation. For utilities, energy storage can deliver reduced operating costs, increased renewable integration, and decreased dependence on fossil-fuel generation. For grid operators, storage can provide a more efficient balance between supply and demand, avoid system upgrades, and improved reliability. Commercial consumers see reduced electricity bills, generated revenue, and control of power disruptions. To the residential consumer, it provides the security of backup power during blackouts and the benefit of reduced electricity bills.

Important legislation is being considered that, constructed correctly, will push us towards a decarbonized future, such as clean energy standard and extending the ITC. We also encourage complementary policy that encourages competitive markets to exist which provide access to more renewables and to minimize hurdles to interregional planning and new transmission development.

SEIA is proud of our industry's contribution to decarbonizing the electricity system, but we know we still have a long way to go. Thank you for your consideration of these policies and continued dialogue with the solar and storage industry.

Sincerely,

Sean Gallagher
Vice-President
State & Regulatory Affairs

Ms. CASTOR. Without objection, all members will have 10 business days within which to submit additional written questions for the witnesses. And I ask our witnesses to respond as quickly as possible.

I also want to thank our professional staff for a very good, detailed memo for this hearing. And it is available online on our website at climatecrisis.house.gov.

Hopefully we will be able to work together here to hammer out an American Jobs Plan that will help us create jobs, reduce pollution, and avoid the worst impacts of the climate crisis.

With that, the hearing is adjourned. Thank you all very much.

[Whereupon, at 12:12 p.m., the committee was adjourned.]

United States House of Representatives
Select Committee on the Climate Crisis

Hearing on May 20, 2021
"Powering Up Clean Energy:
Investments to Modernize and Expand the Electric Grid"

Questions for the Record

Linda Apsey
President and CEO
ITC Holdings Corp.

THE HONORABLE KATHY CASTOR

1. Ms. Apsey, investments in transmission would benefit ratepayers across the country, increase reliability, create American jobs, and enable reductions in carbon pollution from the electricity sector. These widespread benefits suggest that modernizing and expanding the electric grid

should be a goal that Americans of all political stripes can support. Should investing in transmission be part of bipartisan infrastructure legislation?

I fully agree that investing in transmission infrastructure should be a bipartisan priority, and I have been pleased to note the bipartisan support in Congress for investment in this critical infrastructure. Investing in a modernized, expanded transmission grid offers wide-ranging benefits to communities across the nation and to Americans of all political stripes. Well-planned transmission investments can accelerate clean energy adoption, increase the resilience of the electric system, and create high-paying jobs in communities that need them most.

As I noted in my testimony, transformative transmission investment cannot occur absent supportive federal, state, and regional policies. In recent years, Congress has made a good start at addressing this need by introducing legislation that would create a functional interregional planning process, streamline and strengthen federal siting authority, and provide financial incentives to large, transformative projects. Congress' focus on these issues has sent a strong signal to the private sector and helped to build consensus around the need for action. I am hopeful that Congress will now take the next step and seize this opportunity to pass legislation that supports investments in a 21st century electric grid that will benefit all Americans.

2. Ms. Apsey, the February 2021 winter storm in Texas and the mid-continent led to the freezing of critical equipment, power outages, and even deaths. The Southwest Power Pool (SPP) region was able to import power from the PJM Interconnection, which limited power outages. Unfortunately, Texas could not do the same because of much smaller ties to the other interconnections. Experts concluded that SPP would have been even better off had there been more transmission between PJM and the Midcontinent Independent System Operator (MISO) and between the northern and southern parts of MISO. How can transmission lines promote grid reliability as climate change increases the frequency of extreme weather?

As the nation's largest independent electric transmission company, ITC owns and operates high-voltage transmission infrastructure in Michigan, Iowa, Minnesota, Illinois, Missouri, Kansas and Oklahoma. These areas of the United States frequently experience blizzards, windstorms, flooding, and other natural disasters, and ITC has observed an undeniable increase the frequency and severity of these extreme weather events. As recent history has proven, severe weather can cause emergency conditions and outages, particularly in areas that do not have strong transmission connections with neighboring regions.

As the nation faces increases in severe weather, transmission provides crucial flexibility and redundancy in the system to prevent outages and resulting human and economic costs. Strong transmission connections within and between regions allow system operators to leverage geographic and resource diversity when responding to extreme conditions. Further, transmission can reduce the amount of generation needed to meet capacity requirements, which reduces the probability of generation-related outages in isolated pockets of the system.

The ability of transmission to enhance resilience is clear; however, today's transmission planning regime does not fully value the resilience benefits of potential projects. To enhance the ability of the electric system to withstand severe weather, a more proactive and holistic approach to regional and interregional planning is needed. As a first step, regions should engage with their neighbors in interregional planning that incorporates resilience considerations, which today is not required.

3. Ms. Apsey, we have hundreds of gigawatts of wind, solar, and storage projects stuck in interconnection queues. I am working on legislation to help reduce interconnection costs and clear out these queues through broader cost allocation and deployment of grid-enhancing technologies. How would consumers benefit from clearing out the interconnection queues for new wind, solar, and storage projects?

To the extent that interconnections can be accelerated, consumers will benefit from access to lower cost generation, cleaner air, and high-quality infrastructure jobs. In ITC's view, the best way to address queue backlogs is to adopt a "transmission-first" proactive planning approach that facilitates regional and inter-regional transmission build. The current practice, which focuses on incremental additions to the system for each new generation source, imposes significantly higher costs over the long-run and results in the backlogs we see today.

As you correctly note, transmission cost allocation continues to be a major obstacle to transmission development and the interconnection process. In order to properly

recognize beneficiaries of transmission, policymakers should provide supportive cost allocation mechanisms that consider multiple benefits and assign costs accordingly. This, along with a proactive regional planning process, will help to accelerate the queue process and provide significant benefits to consumers.

4. Ms. Apsey, you stated in your testimony that an investment tax credit could support transmission expansion. According to a recently released report from the American Council on Renewable Energy (ACORE), an investment tax credit for transmission could spur 4,000 miles of high-capacity lines, capable of serving 30 gigawatts of new renewable energy projects. If completed, these lines and new projects would create over 600,000 jobs and spur $15 billion in new investment. Please describe the kinds of benefits you anticipate from an Investment Tax Credit.

A well-designed Investment Tax Credit for transmission can offer a useful tool to promote large, transformative transmission projects that can accelerate renewable development and enhance system resilience. For non-regulated transmission projects (sometimes known as "merchant" projects), the story is simple; an investment tax credit reduces the costs that must be recovered through contracted rates, making it easier to secure the necessary agreements and move ahead to construction.

For regulated transmission projects, an investment tax credit can help to reduce the costs that customers must bear for major lines. This, in turn, can help to secure project approval, which is often done based on an accounting of costs and benefits. The tax credit can also make it easier to secure broad cost allocation agreements amongst stakeholders, which are necessary to build regional and interregional transmission. Further, if the tax credit is limited in duration, this can help encourage stakeholders to move ahead with projects faster to ensure they qualify for the credit within the eligibility window.

For FERC-regulated projects, policy design is key to ensure the tax credit works as intended. ITC believes it is important that the credit is only available to those projects that need it to move forward, rather than available retroactively to projects which have already secured key approvals (and would move ahead regardless). If this is achieved, the tax credit can be a meaningful "tool in the toolbox" to support significant new investments in beneficial transmission infrastructure.

THE HONORABLE JARED HUFFMAN

1. In addition to more renewable energy, we want a grid that doesn't spark fires every time the wind blows. As someone who represents arid California, how will these grid modernization investments also address the fire-prone nature of our current grid?

ITC's footprints are located in the Midwest, which rarely experiences wildfires. Instead, our region experiences severe cold, windstorms, flooding, and high summer temperatures. As such, I can only speak to ITC's experience managing resilience risks specific to our footprints. However, we believe the principle that grid modernization and expansion can enhance resilience by adding flexibility and redundancy to the system holds true regardless of the specific nature of the threat.

In ITC's view, electric infrastructure cannot be made fully resilient through any single program or set of design codes. Instead, resilience must be pursued through a multi-faceted commitment to enhanced design standards, proactive system maintenance, aging infrastructure replacement, and long-term system planning that prioritizes enhanced transfer capability and critical path redundancy. All of these measures have a cost, which must be considered against the nature of the risk, hand-in-hand with regulatory authorities and key stakeholders.

Given the regional differences in resilience threats, local transmission owners best understand the unique geographies and needs of their systems. In consultation with regulators and stakeholders, transmission owners should be afforded flexibility to pursue resilience measures best suited to region-specific threats.

Questions for the Record

Donnie Colston
Director, Utility Department
International Brotherhood of Electrical Workers

THE HONORABLE KATHY CASTOR

1. Mr. Colston, investments in transmission would benefit ratepayers across the country, increase reliability, create American jobs, and enable reductions in carbon pollution from the electricity sector. These wide-

spread benefits suggest that modernizing and expanding the electric grid should be a goal that Americans of all political stripes can support. Should investing in transmission be part of bipartisan infrastructure legislation?

Speaking for the International Brotherhood of Electrical Workers, the IBEW strongly supports the inclusion of federal investment in electrical transmission as part of a bipartisan infrastructure bill. Our electrical grid is one of the fundamental building blocks upon which the rest of our nation's infrastructure, investments and innovations rely upon. It is critical that all Americans have access to safe, reliable electricity upon demand. This is not simply a matter of the convenience of turning on your television or electronic device. This can be a matter of life or death for Americans who need reliable electrical service to keep their oxygen machines on or who need regular dialysis services.

We have seen some of the unfortunate events in recent years that can take place when electrical service, both at the transmission and distribution level, becomes unreliable or when transmission lines need to be temporarily powered down due to the weather or when a regional transmission organization (RTO) or independent system operator (ISO) do not have enough tie-ins to neighboring electric power transmission systems. The IBEW believes the federal government can play an important role in providing the investments necessary to facility much needed transmission line construction that would avoid these recent blackouts, as well as update regulations that would help facilitate more privately-financed transmission construction.

Robust federal investment in transmission would also mean significant work for our members. Outline line construction and maintenance is difficult work that needs to be undertaken by trained professionals. This type of work, in addition, provides the types of middle class, family-sustaining wages and benefits that have been called for by President Joe Biden and many Members of Congress as a key benefit of pursuing bipartisan infrastructure legislation.

2. Mr. Colston, the February 2021 winter storm in Texas and the mid-continent led to the freezing of critical equipment, power outages, and even deaths. The Southwest Power Pool (SPP) region was able to import power from the PJM Interconnection, which limited power outages. Unfortunately, Texas could not do the same because of much smaller ties to the other interconnections. Experts concluded that SPP would have been even better off had there been more transmission between PJM and the Midcontinent Independent System Operator (MISO) and between the northern and southern parts of MISO. Would building new transmission lines help increase the reliability of the grid?

Without question, building new transmission lines would help increase the reliability of the North American electrical grid. In 2017, IBEW International President Lonnie R. Stephenson testified before the House Energy and Commerce Committee saying as such, "We need a truly national grid and new transmission lines that can safely and reliably transfer power—including renewables like wind and solar—from energy rich regions to those parts of the country most in need. And that means we need new transmission projects that will cross multiple jurisdictions and state lines."[1] The IBEW continues to hold the same stance that additional transmission lines would provide greater reliability. It is our sincere hope that greatly federal investment in electrical transmission will help avoid future catastrophes, such as the February 2021 Texas blackouts that impacted millions of Americans, including a large number of our membership in the state.

3. Mr. Colston, we have hundreds of gigawatts of wind, solar, and storage projects stuck in interconnection queues. I am working on legislation to help reduce interconnection costs and clear out these queues through broader cost allocation and deployment of grid-enhancing technologies. I am also working on legislation to help develop new interstate transmission lines by providing technical assistance and incentives to state and local governments. How would consumers benefit from clearing out the interconnection queues for new wind, solar, and storage projects? Would federal technical assistance and incentives to state and local governments help speed up consideration of interstate transmission lines?

In response to the question regarding Chair Castor's legislation to help develop new interstate transmission lines by providing technical assistance and incentives to state and local governments, my written testimony states the following: "We are also supportive of the proposal to authorize federal funding for the Department of Energy to provide technical assistance for state, local and tribal authorities to conduct transmission planning and review applications of proposed transmission

projects." Technical assistance and incentives to state, local and tribal governments to develop new interstate transmission lines would enhance the safety and reliability of the electrical grid, allow additional renewable and low carbon generation to be added to the grid, and very likely put more IBEW members to work.

In addition, the IBEW supports efforts to accelerate the construction of electrical transmission lines. One of the more significant issues to building additional electrical transmission is cost allocation. In 2019, the IBEW signed onto a multi-stakeholder letter, including the Edison Electric Institute (EEI), the Solar Energy Industries Association (SEIA) and WIRES, regarding electrical transmission policy. Among the principles all the stakeholders agreed to was:

> [T]he Federal Energy Regulatory Commission, the U.S. Department of Energy, and state economic regulators should assess the need to improve upon and revise regulatory processes and corresponding regulations and policies governing the planning and cost allocation of high voltage electric transmission, balancing the public's interest in expedition, cost savings, care of the environment, and an equitable sharing of burdens.[2]

The IBEW still stands behind these policies in regards to improving and revising regulatory processes for transmission planning and cost allocation, particularly the principle of an equitable sharing of burdens. As such, we hope Chair Castor's legislation will uphold the principle of an equitable sharing of burdens when it comes to the cost allocation of electrical transmission.

References Page

[1] *https://www.ibew.org/media-center/Articles/17daily/1702/170221_WhatIBEWandCongress.*
[2] *https://wiresgroup.com/diverse-coalition-signs-statement-of-principles-on-modernizing-the-electric-transmission-grid/.*

Questions for the Record

Emily Sanford Fisher
General Counsel, Corporate Secretary and
Senior Vice President, Clean Energy
Edison Electric Institute

THE HONORABLE KATHY CASTOR

1. The Select Committee's 2020 majority staff report "Solving the Climate Crisis: The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America" calls for adoption of clean energy standard (CES) to achieve net-zero emissions in the electricity sector. Portfolio standards are a proven tool for cutting carbon pollution: in the United States, thirty states, Washington, D.C., and three territories have adopted a renewable portfolio standard or CES. What are the critical issues that Congress must consider in developing a national CES? What is EEI's position on a national CES?

The Edison Electric Institute (EEI) supports a well-designed CES as an important tool for reinforcing and accelerating electric companies' ongoing clean energy transition. As of year-end 2020, the electric power sector had reduced its carbon emissions 40 percent below 2005 levels, while keeping electricity affordable and reliable for customers. Today, carbon emissions from the electric power sector are at their lowest level in more than 40 years—and they continue to fall.

A diverse array of clean energy resources has made these reductions possible: 40 percent of all U.S. power generation now comes from clean, carbon-free sources, including nuclear energy, hydropower, wind, and solar energy. Accordingly, one of the most critical issues in developing a national CES is the continued focus on using all clean, carbon-free resources. A CES must recognize or credit all clean resources, including nuclear energy and hydropower, and must be flexible enough to value new and emerging technologies, like carbon capture and storage (CCS) and hydrogen, among others.

In addition, as many recent studies assessing the paths to a carbon-free U.S. economy indicate, combined cycle and combustion turbines will continue to be the most cost-effective technologies to integrate more renewable energy reliably.[1] These 24/

[1] *See, e.g.,* E. Larson, C. Greig, J. Jenkins, E. Mayfield, A. Pascale, C. Zhang, J. Drossman, R. Williams, S. Pacala, R. Socolow, EJ Baik, R. Birdsey, R. Duke, R. Jones, B. Haley, E. Leslie, K. Paustian, and A. Swan, *Net-Zero America: Potential Pathways, Infrastructure, and Impacts,*

7 technologies, which use natural gas today, can be transitioned to cleaner fuels or retrofitted with CCS as those options become available at scale and at costs that protect customers. A CES, therefore, should recognize the value of these technologies both today and in the future.

Other important design elements for any CES include compliance flexibilities, such as banking and credit trading, and other tools that recognize that continued increases in the amount of clean energy deployment are not likely to occur at an even annual pace, but instead in "chunks" as new generation is built and other generation is retired. Similarly, using a company-specific, multi-year average as a baseline can be an important design element to recognize that there is variability in annual reductions and that different companies and regions are starting at different places in the clean energy transition.

Cost-containment mechanisms should be included to protect customers. These can include alternative compliance payments and price caps. Timing flexibilities also are necessary to preserve affordability and reliability. These tools allow companies to match compliance deadlines with the availability of technology, particularly new, 24/7 clean resources, and can help address factors beyond companies' control, like the timeline for the development of new transmission necessary to interconnect new clean resources.

The timeline for achieving 100 percent clean energy targets will depend on the development of new, affordable carbon-free technologies, which include long-duration storage; CCS; advanced renewable generation; advanced nuclear generation; and new fuels, such as hydrogen. As a CES alone may not incent sufficient research, development, demonstration, and deployment investments in these technologies in this decade, complementary policies should be part of any larger legislative package that includes a CES.

Similarly, while a CES can be an important tool to support and accelerate the clean energy transition for the electric power sector, other policies will be needed to ensure economy-wide reductions. Clean electricity can help reduce emissions in other sectors, particularly the transportation and building sectors. To the extent necessary, a CES should recognize and support the electric power sector's role in helping achieve economy-wide carbon reduction goals.

2. Ms. Fisher, investments in transmission would benefit ratepayers across the country, increase reliability, create American jobs, and enable reductions in carbon pollution from the electricity sector. These widespread benefits suggest that modernizing and expanding the electric grid should be a goal that Americans of all political stripes can support. Do you think it would be a missed opportunity if we did not invest in transmission as part of infrastructure legislation?

EEI's member companies invest more than $120 billion each year, on average, to make the energy grid smarter, stronger, cleaner, more dynamic, and more secure. These investments help diversify the nation's energy mix and integrate new technologies that benefit customers. They also create jobs, as EEI's member companies and their workers partner to modernize the energy grid to better serve customers.

Electric transmission infrastructure is the backbone of the nation's energy grid and is critical to facilitating the continued transition to clean energy. The transmission system already has enabled electric companies to integrate more clean energy resources and technologies into the grid affordably and reliably. To support the clean energy transition, critical electric transmission and other energy grid infrastructure must be built more quickly.

In addition to investing in transmission—including supporting increased private investment in transmission—other complementary policies are needed. The way the nation plans, permits, and pays for transmission can present more significant obstacles to building the transmission we need in reasonable timeframes than a lack of investment. Coupling federal investment support with other policy changes is essential.

In two critical areas, federal government support for continued and expanded investment in the energy grid could be transformative. First, investments to improve the resiliency of the energy grid (ensuring electric companies are at the center of such modernization) may be necessary to help some communities adapt to the changing climate and increased risks of natural disasters, including storms, hurricanes, and wildfires. Public-private partnerships, grants, and funding for state en-

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interim report (Princeton University, Princeton, NJ, Dec. 15, 2020) at Clean Firm Resources and Thermal Plant Retirements, pp. 177–199,
https://netzeroamerica.princeton.edu/img/Princeton_NZA_Interim_Report_15_Dec_2020_FINAL.pdf.

ergy offices to address resiliency can be effective tools to support these investments and to leverage investments being made by EEI members.

Specifically, EEI supports H.R. 2885/S. 1432, the Power On Act; S. 704, the Disaster Safe Power Grid Act; reauthorization of the Smart Grid Investment Program to recognize deployment of resiliency technologies; and, within the CLEAN Future Act, Section 230, the 21st Century Power Grid Act, and Section 371, Facilities Energy Resiliency, which boosts funding for the Department of Energy's State Energy Program.

Second, federal support for investments in electric vehicle (EV) charging infrastructure can spur transportation electrification. Today, the largest challenge facing the EV market is the charging infrastructure needed to support market growth, not the energy grid that powers that infrastructure. A report from EEI and the Institute for Electric Innovation predicts that, by 2030, U.S. EV sales will exceed 3.5 million per year and that 18.7 million passenger EVs will be on U.S. roads, requiring about 9.6 million charging stations.

EEI's member companies are investing nearly $3 billion in customer programs and projects to deploy charging infrastructure and to accelerate electric transportation. Increasing investment from all stakeholders—including electric companies, automakers, charging network providers, and others—will help drive transportation electrification.

THE HONORABLE ANTHONY GONZALEZ

1. As we look to modernize the grid and secure it from cyber intrusions, what is the role of private communications networks?

2. What opportunity is there to leverage utility communications networks and related infrastructure to help bridge the "digital divide" and deliver high-speed internet access to locations that have electricity but lack reliable access to broadband service?

Electric companies long have incorporated telecommunications equipment and fiber technology into their operations—particularly in rural areas—to support their communications infrastructure and to provide real-time monitoring and controls for generation and transmission operations.

Substantial investments in telecommunications technology are needed to make the energy grid smarter, stronger, cleaner, more reliable, and more secure. Building out electric companies' telecommunications network supports secure communications for mission-critical applications, facilitates additional smart grid tools and distributed energy resources, and makes the grid more resilient and more efficient. As regulated service providers, electric companies are well-positioned to help close the digital divide, as they have a physical connection to nearly every home and business within their service territory.

The importance of increasing access to broadband and making it universally available can be compared to the electrification of the United States, and policymakers are looking to electric companies to help bridge the gap. To provide multiple benefits to customers, electric companies are working with the communities they serve and with broadband providers to forge ahead with creative new partnerships designed to benefit everyone.

With the formation of partnerships, needed changes to state initiatives and laws, and the support of local communities, many electric companies are helping to bring affordable and reliable broadband to underserved and unserved communities, particularly as they upgrade the energy grid and install more fiber to support their critical communications network. Electric companies can install new fiber within their existing networks with enough capacity to support their needs and can lease additional capacity to others. This ability to install and to lease additional fiber has helped to lower broadband deployment costs in historically high-cost underserved and unserved communities.

Under this arrangement, the electric company provides the "middle mile" infrastructure—the segment that connects a local access point to the major carriers and the broader internet—which the internet service provider (ISP) will use to build out "last mile" broadband services to homes and businesses. Installing middle mile infrastructure typically is cost-prohibitive for ISPs in these areas, but partnering with electric companies allows both entities to build needed infrastructure cost-effectively and to reduce costs both for electricity customers and new internet customers.

THE HONORABLE MIKE LEVIN

1. As we are all aware, the condition and operation of the grid in California has led to repeated catastrophic wildfires in our state. I wanted to touch on the role that technology can play as we seek to address wildfire

risk. A utility in my district is working to deploy a solution that uses wireless broadband, smart grid technology to depower broken lines before they contact the ground. This is intended to eliminate the ability for downed lines to serve as an ignition source for wildfires. Ms. Fisher, do you believe widescale deployment of this type of solution could help protect against the sort of utility-caused wildfires we've experienced in California? And if so, what policy changes or funding recommendations would accelerate deployment of this and related technologies?

Wildfires are a persistent and dangerous threat throughout much of the country, and they are particularly prevalent in the West. Nearly 85 percent of wildfires are "human-caused," a broad category that includes fires started by unattended campfires, burning debris, equipment use and malfunctions, improperly discarded cigarettes, and arson. Electrical equipment and downed power lines also can pose a potential fire risk, particularly when the weather is hot, dry, and windy.

Wildfire behavior is unpredictable due to many variables, including weather conditions, terrain, and tree and vegetation species. This confluence of factors, coupled with changing climate conditions and population growth in more remote areas known as the wildland urban interface, is leading to more frequent, more destructive, and more costly wildfires.

Given the growing threat of wildfires within their service territories, electric companies continue to invest in mitigation, detection, and response efforts to reduce wildfire risk. They also are focused on prevention, protection, and public-private partnerships.

Electric companies are making significant investments to harden their systems and to make the energy grid more resilient. Actions include incorporating artificial intelligence, aerial inspections, and various low- and high-tech methods to mitigate potential fire risk caused by electrical equipment and to defend against passing wildfires.

While it is not possible to predict definitively where and when a wildfire may start, it is possible to use data analytics, combined with increasingly accurate weather forecasts and vegetation conditions, to identify high-risk areas. In addition to their enhanced mitigation efforts, some electric companies preemptively shut off power in these risk-prone areas when dangerous weather conditions or high wind events are predicted that could impact electric equipment and power lines. In recent years, electric companies have made significant investments in the energy grid—including system segmentation, islanding, and microgrid deployment—that have reduced the scale and scope of these events.

As noted, EEI supports the following bills, which would support efforts to minimize the wildfire risks that electric equipment may pose: H.R. 2885/S. 1432, the Power On Act; S. 704, the Disaster Safe Power Grid Act; reauthorization of the Smart Grid Investment Program to recognize deployment of resiliency technologies; and, within the CLEAN Future Act, Section 230, the 21st Century Power Grid Act, and Section 371, Facilities Energy Resiliency, which boosts funding for the Department of Energy's State Energy Program.

Hardening their systems against increasingly destructive weather conditions is a top investment priority for electric companies. Among their investments, electric companies are installing stronger and more fire-resistant poles and are placing sensors, high-definition cameras, and weather stations and other protective technologies in the field to provide real-time or near real-time information to electric company command centers and first responders.

Collectively, the electric power industry has improved real-time situational awareness capabilities significantly. In fact, electric companies in the West have some of the most advanced weather tracking systems in the country. They also are coordinating with various federal agencies through the Department of Energy to establish shared information platforms that will allow access to mapping tools, satellite data, fire spread modeling, and other analytics that will help drive real-time decisions and actions.

In addition to reducing the risk of fires caused by electric equipment, these measures help to protect equipment from being damaged or destroyed by wildfires and help to minimize service disruptions within and adjacent to fire perimeters.

While wildfires typically are seasonal, electric companies work closely year-round with federal, state, local, and tribal agencies to help identify high-risk areas. This constant collaboration, coordination, and communication focuses unified attention on proactive mitigation measures ranging from high-tech data analysis and aerial inspections via drones to fuel reduction and vegetation management. The electric power industry also enjoys great cooperation with federal government partners—specifically the U.S. Forest Service; the Departments of Agriculture, Energy, and In-

terior; and the Federal Aviation Administration—as well as with state regulators and local officials.

EEI's CEO Wildfire Task Force and the Electricity Subsector Coordinating Council's Wildfire Working Group, which includes investor-owned electric companies, electric cooperatives, and public power utilities, are focused on mitigation efforts, detection, and response as part of a comprehensive wildfire strategy. These efforts are core industrywide objectives for ensuring public safety.

Electric companies—individually and through partnerships with federal, state, and local stakeholders—are taking extraordinary measures to reduce wildfire risks on their systems and are working closely with wildfire managers before, during, and after fires to help save lives and protect property. Public policies must be reformed to support the continued efforts by electric companies and their wildfire partners to mitigate wildfire risk. It is vital that policymakers:

- Pursue land management strategies that allow electric companies to protect power line rights-of-way (ROW) by allowing access and authority to conduct vegetation management and operation and maintenance activities within and adjacent to ROW.
- Identify and enhance partnership opportunities to assist in fuel reduction efforts on federal lands.
- Expand the use of drones beyond the visual line of sight to conduct more efficient, cost-effective, and timely inspections for wildfire mitigation.
- Increase investments in grant programs at the Department of Energy and with the national laboratories to identify available and emerging technologies that could prevent, detect, and mitigate wildfire impacts. Regulatory structures should allow the deployment of this technology.
- Increase investments in grant programs at the Department of Energy to address costs associated with wildfire risk mitigation efforts.
- Increase investment in infrastructure resilience and recovery by providing federal funding for grants and tax incentives for investments in wildfire mitigation technologies.

Questions for the Record

Michael Skelly
Founder and CEO
Grid United

THE HONORABLE KATHY CASTOR

1. Mr. Skelly, you alluded to the February 2021 winter storm in Texas and the mid-continent in your testimony. This storm led to the freezing of critical equipment, power outages, and even deaths. The Southwest Power Pool (SPP) region was able to import power from the PJM Interconnection, which limited power outages. Unfortunately, Texas could not do the same because of much smaller ties to the other interconnections. Experts concluded that SPP would have been even better off had there been more transmission between PJM and the Midcontinent Independent System Operator (MISO) and between the northern and southern parts of MISO. How can transmission lines promote grid reliability as climate change increases the frequency of extreme weather?

As I stated in my testimony, no grid system covered itself in glory during the tragic events of February's deep freeze. It is clear, however, the system operators who had access to bulk power flows from neighboring regions were better positioned to mitigate the worst of the effects from the freeze. With its limited transmission ties to other regions, the ERCOT power system was only able to import about 800 MW while trying to balance its short supply and heavy demand. Its neighbors, SPP and MISO were able to import roughly 15 times that amount during the winter storm because of stronger interregional transmission connections.

As climate change increases the frequency of extreme weather events, high-voltage transmission lines will play a critical role in ensuring the resilience and reliability of our power systems. Winter Storm Uri broadly impacted multiple regions. However, like other such events we have seen in the past, Uri was at its most extreme only in areas much smaller than the size of the Eastern and Western Interconnections. Strong transmission connections across regions allowed power to be exported from regions not experiencing stressed power demands to areas with the worst of the extreme weather.

More regional transmission ties inherently create a more climate resistant system. Had the proposed Southern Cross transmission line been operational during storm Uri, its 2000 MW of capacity could have powered 400,000 homes within the ERCOT system. If the ERCOT region had multiple such ties, Uri would have been a much less harmful event—perhaps even mitigated entirely.

2. Mr. Skelly, we have hundreds of gigawatts of wind, solar, and storage projects stuck in interconnection queues. I am working on legislation to help reduce interconnection costs and clear out these queues through broader cost allocation and deployment of grid-enhancing technologies. I am also working on legislation to help develop new interstate transmission lines by providing technical assistance and incentives to state and local governments. How would consumers benefit from clearing out the interconnection queues for new wind, solar, and storage projects? Would federal technical assistance and incentives to state and local governments help speed up consideration of interstate transmission lines?

Any technical assistance that can be given to state and local governments to help speed along system-wide transmission planning would be a welcomed new development. Clearing interconnection queues across the country is the key to reaching ambitious de-carbonization goals. The wind, solar, and storage projects currently trapped in these queues will remain stuck absent robust policy changes in transmission planning. The best wind and solar capacity in the country is located in sparsely-populated regions with relatively modest load centers, and—importantly—weak existing transmission lines to tie into.

Current transmission planning methodologies in RTOs and ISOs across the country place the burden of network system planning on generators. By more broadly cost-allocating interconnection upgrades, individual costs to consumers will be reduced because more low cost renewables will get built.

Consumers will benefit from the clearing out of interconnection queues around the country through the lower cost wholesale energy prices of wind and solar projects relative to other forms of power generation. This will mean lower emissions of pollution and cleaner air as more fossil fuel plants are retired and replaced with clean energy.

3. Mr. Skelly, you stated in your testimony that an investment tax credit could support transmission expansion. According to a recently released report from the American Council on Renewable Energy (ACORE), an investment tax credit for transmission could spur 4,000 miles of high-capacity lines, capable of serving 30 gigawatts of new renewable energy projects. If completed, these lines and new projects would create over 600,000 jobs and spur $15 billion in new investment. Please describe the kinds of benefits you anticipate from an Investment Tax Credit.

An Investment Tax Credit (ITC) of the kind identified in the ACORE report would allow more projects to pass the benefit-to-cost ratio test by lowering the denominator of this test. If more transmission lines are built, we will realize lower carbon emissions, lower cost electricity prices as more renewables escape interconnection queues, and more resilient systems to extreme weather events caused by climate change. Not only will cost-allocated projects reap the benefits of an ITC, but the economics of more merchant transmission lines improve with a 30% ITC.

For "merchant" lines that are not cost allocated, reducing the cost of the projects via an ITC will allow transmission developers to lower their transmission charges and thus more projects to get built.

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