RPTR ZAMORA

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THE CLEAN FUTURE ACT:

POWERING A RESILIENT AND PROSPEROUS AMERICA

WEDNESDAY, MARCH 24, 2021

House of Representatives,

Subcommittee on Energy,

Committee on Energy and Commerce,

Washington, D.C.

The subcommittee met, pursuant to call, at 1:57 p.m., via Webex, Hon. Bobby L. Rush [chairman of the subcommittee] presiding.

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

Staff Present: Jeff Carroll, Staff Director; Waverly Gordon, General Counsel;

Tiffany Guarascio, Deputy Staff Director; Perry Hamilton, Deputy Chief Clerk; Mackenzie Kuhl, Press Assistant; Kaitlyn Peel, Digital Director; Tim Robinson, Chief Counsel; Chloe Rodriguez, Deputy Chief Clerk; Michael Cameron, Minority Policy Analyst, CPC, Energy, and Environment; Nate Hodson, Minority Staff Director; Peter Kielty, Minority General Counsel; Mary Martin, Minority Chief Counsel, Energy and Environment; and Michael Taggart, Minority Policy Director.

Mr. Rush. The Subcommittee on Energy is now in order.

Today, the subcommittee is holding a hearing entitled "The CLEAN Future Act: Powering a Resilient and Prosperous America."

Due to the COVID-19 public health emergency, today's hearing is being held remotely. All members, all witnesses will be participating via videoconferencing.

As part of our hearing, microphones will be set on mute for purposes of eliminating inadvertent background noise. Members and witnesses, you will need to unmute your microphone each time you wish to speak.

Documents for the record can be sent to Lino Pena-Martinez at the email address that we have provided to staff. All documents will be entered into the record at the conclusion of the hearing.

The chair now recognizes himself for 5 minutes for the purposes of an opening statement.

Good afternoon again. Today, the Subcommittee on Energy will hold a legislative hearing as a continuation of the committee's work to address recent grid failures in the south-central region of our Nation. This morning, the Subcommittee on Oversight and Investigations held a hearing to identify the nature of this problem. We now convene to identify policies that will relaunch a much-needed Federal grid investment in the wake of these tragic failures.

In February, extremely frigid, Chicago-like temperatures spread across the south-central region, resulting in historically high energy demand and disastrous low energy supply. This sharp energy decline was a result of every single source of power supply underperforming during the same weather event.

Further, every single source of supply underperformed as a consequence of poor planning, deregulation by States, and negligible weatherization practices. These widespread outages threaten the health and safety of millions of Americans, and particularly Texans, amid the ongoing coronavirus pandemic.

It is incumbent on this committee and this subcommittee to use its broad jurisdiction over national energy policy to identify Federal solutions to prevent a disruption in vital energy services from occurring again. This subcommittee has prioritized legislative solutions in response to these types of events under both Democratic and Republican majorities, and the outages in Texas are no exception to this well-established standard.

Just last year, the Subcommittee on Energy held a hearing on the California wildfires. During the Republican majority, I might add, Democrats also participated in a bipartisan hearing to restore Puerto Rico's electric infrastructure after Hurricane Maria.

And, in this same vein, the expert witnesses are called before us today to discuss policies to deeply decarbonize our economy and strengthen our infrastructure against threats like those posed by climate change.

Federal investment to prevent these matters is of great importance considering the recent tragedy in Texas and the need to secure our Nation's energy system by and large. The CLEAN Future Act, which I introduced along with Chairman Pallone and Chairman Tonko, with contributions from every esteemed member of this committee, one by one and name by name, aims to upgrade and reinforce our energy infrastructure to those ends.

Just for an example, the CLEAN Future Act establishes funding for a variety of grid resiliency measures, to include crucial equipment replacements, microgrids, and

programs to provide distributed energy systems and solar power within underserved and disadvantaged communities.

The bill also bolsters transmission infrastructure in order to deliver clean energy to areas with high electricity demand. Energy efficiency is also crucial and critical to a resilient and reliable grid.

And, with that, I want to yield to my friend and colleague, the gentleman from Michigan, Mr. Upton, for 5 minutes for the purposes of an opening statement.

[The prepared statement of Mr. Rush follows:]

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

Mr. Upton. Well, thank you, my friend and chairman, for holding today's virtual hearing.

As we know, this is the first legislative hearing in this subcommittee this Congress after a big bipartisan success -- so credit to lots of folks on both sides of the aisle and in both sides of the Capitol -- with the passage of the Energy Act of 2020 just 3 months ago.

You know, the Energy Act of 2020 is the most significant energy legislation in more than a decade, with substantial new regulatory policies and big increases in spending authority for energy efficiency, technology innovation, and certainly grid modernization, something that we all care deeply about.

We passed demonstration projects for natural gas, carbon capture, nuclear energy storage, hydro -- and the list goes on and on. We came together on these clean-energy projects and programs that the members of this committee have supported for years, and we pushed them over the finish line. It was hard work, it took some time, but that is what it takes to get signed into law with real bipartisan support.

So the Energy Act of 2020 is our bipartisan roadmap for clean-energy innovation and the most recent reflection of bipartisan congressional intent now that we must turn to the implementation.

So we have an aggressive timeline of new programs and more than a dozen large-scale demonstration projects that have to be funded in the next couple years. This committee must be focused on holding DOE accountable to the Energy Act of 2020 timeline, rather than rushing ahead, perhaps, with a new partisan bill.

But, unfortunately, that is not the approach it looks like we are taking today. None of us on this side of the aisle are embracing the Green New Deal, which has been

rebranded by some as the CLEAN Future Act.

To sum it up, the CLEAN Future Act is a 981-page bill with hundreds of billions of dollars in American taxpayer giveaways to countries like China that control critical mineral production and cheap labor; it is a rush to green -- no bad words to our Chairman Rush -- but it is a rush to green; and a radical transformation of America's workforce.

The CLEAN Future Act could eradicate millions of great jobs in fossil, nuclear, and manufacturing while leaving energy workers behind. This CLEAN Future Act promises to remove good-paying jobs, retrain workers, relocate them to new cities where they are going to have to make a new life for themselves. It will decimate our energy security and leave us hooked on China for cheap solar panels and batteries. That is not the future that those of us on this side of the aisle are looking for for America.

Rather than jamming this CLEAN Future bill through the committee process, I would urge my colleagues to slow down, think about the damage that it will do to America's workers. And I look forward to using today's hearing to focus on these very real issues facing our workers.

I would like to welcome Mr. Hofmann, president of Utility Workers Local 132, who is going to testify today on behalf of 4,000 workers in southern California. They are on the front lines in the fight in California, which is the model that some Democrats want to focus on for the rest of the country.

So, Mr. Hofmann, I look forward to your testimony on the importance of a balanced policy that protects workers and access to affordable energy.

I hope that my colleagues on both sides of the aisle will abandon this aggressive, partisan approach in favor of an all-of-the-above strategy that prioritizes energy security, reliability, and affordability.

And I yield back the balance of my time.

[The prepared statement of Mr. Upton follows:]

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

Mr. Upton. You have to unmute yourself again.

The Chairman. Bobby?

I don't know if he can hear me or if any of you can hear me.

Mr. Rush. I can hear you. Here I am.

The gentleman yields back.

The chair now recognizes Mr. Pallone, the chairman of the full committee, for 5 minutes for the purposes of an opening statement.

The Chairman. Thank you, Chairman Rush.

Let me say, as much as I like Fred Upton, I totally disagree with what he just said about the CLEAN Future Act. I think that, if we don't want to be left behind by China and other global competitors, we have to move towards a green economy.

You know, Fred, you mentioned China and solar panels. I mean, the mistake that has been made is that we did not manufacture and encourage the manufacture of solar panels and wind turbines, and so now the Chinese are way ahead of us.

But we just can't continue to rely primarily on fossil fuels while everyone else, including China, moves ahead with, you know, with green initiatives and renewables, because they are just going to eat our lunch even more.

And so the answer is not to ignore the reality of the jobs and the creation of jobs that come from a green economy but to embrace it, the way China and so many, you know, of the more developed countries have done. If we don't do that in this global environment, then, you know, our economy will lose out, the job creation that comes from renewables will pass us by, and we will just suffer.

And so that is -- it is just the opposite, I think, of what you said. And that is what

the CLEAN Future Act is about. It is about the future and being competitive in the future.

So this is our first legislative hearing on H.R. 1512 in this subcommittee, the Energy Subcommittee's first legislative hearing on H.R. 1512, the CLEAN Future Act. And this hearing will examine parts of the CLEAN Future Act that address resilience in the power sector, with an eye towards the recent Texas power crisis and policies to avoid a repeat of that tragic situation.

This morning, as Chairman Rush mentioned, our Oversight and Investigations Subcommittee examined the Texas power crisis, and now this afternoon we are talking about solutions.

The CLEAN Future Act contains numerous provisions to make our power sector cleaner, more reliable, and more resilient.

First, the 21st-Century Power Grid program, based on legislation introduced by Representative Sarbanes, invests $7 billion over 10 years to improve the resiliency, performance, and efficiency of the electricity grid. This critical investment should help us avoid grid failures like we saw in Texas.

The CLEAN Future Act also incorporates the Energy-Resilient Communities Act, authored by Representatives Barragan and Clarke, which invests in clean-energy microgrids to increase climate-change resiliency.

It also includes numerous provisions to boost energy efficiency in homes, buildings, and other facilities. Reducing energy demand can lessen stress on the grid and improve overall grid reliability.

The bill also includes a suite of new provisions to enable responsible build-out of the electricity transmission system to increase reliability and achieve national

clean-energy goals.

And this increased resilience and reliability could have helped avoid some of the impacts of the extreme cold weather event in Texas which took a crushing toll on the lives of millions of Texans. Four million customers suffered without power for days in subfreezing temperatures. More than 14 million people across Texas were under boil-water notices, forcing them to wait in line at distribution centers just to get safe drinking water. And, tragically, at least 57 Texans died during the storm.

As affected Texans try to piece their lives together, many of us are left asking, how could this happen? And that is why we held the O&I Subcommittee hearing this morning.

I think one thing is clear: The Texas grid operator should have seen this coming. Texas and surrounding States have experienced multiple extreme cold weather events over the past 40 years, and if you look at the reporting on these events, common themes emerge. First is a failure to properly winterize power generation facilities, natural gas production facilities, and other related energy infrastructure.

It is also clear that natural gas facilities failed to perform as expected during extreme cold conditions. During the 2014 polar vortex, natural gas represented over 55 percent of the total outages, and in a similar cold snap in 2018, natural gas generation represented at least 70 percent of the unplanned outages. In this recent storm, natural gas outages represented more than half of the total generation forced offline in ERCOT's territory.

And as far back as 2011, one report found that the pattern of natural gas production declines during extreme cold events, indicating -- and I am quoting -- "the level of winterization put in place by producers is not capable of withstanding unusually

cold temperatures."

While nothing, I think we all agree, and Chairwoman Diana DeGette said, that nothing could have completely prevented the devastation from the storm, it is still evident that at least 10 years ago it was clear what needed to be done to prepare, and no action was taken.

So these extreme weather events are only going to increase in frequency and severity because of climate change. The CLEAN Future Act is designed to get us to a 100-percent clean economy by no later than 2050 and improve the resiliency of our electric infrastructure.

While no one piece of legislation could have prevented the devastation experienced from the storm, my hope is that the CLEAN Future Act will serve as a foundation for exploring the best solutions to our changing climate that could help protect people in the future from suffering similar experiences.

So I just want to say, again, going back to what Congressman Upton said, look, we want -- the CLEAN Future Act is what we have put forward as Democrats. We want input from the Republicans. We understand that there are a lot of things where we can have common ground, on things like resiliency, energy efficiency.

As you know, both Chairman Rush and Ranking Member Upton came together at the end of last year with an energy package, the majority of which was actually incorporated in the end-of-the-year omnibus bill. So we can work together. I don't want anybody to think that, you know, the CLEAN Future Act is the end and that is it. We want input. But I also think that we have to recognize that if we don't move towards a green economy we are going to be left behind.

And I agree with our ranking member of the full committee, Mrs. Rodgers, that

China is a huge threat. But the threat has to be, you know, hit head-on. And to just, you know, say we are going to continue to do things the old way while they move ahead and eat our lunch, that is not the answer.

So I think there is a lot of common ground here, although you may not hear too much about it today.

But thank you, Mr. Chairman. I yield back.

[The prepared statement of the chairman follows:]

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

Mr. Rush. The chairman yields back.

And now the chair recognizes the gentlelady from Washington, the ranking member of the full committee, Mrs. Rodgers, for 5 minutes for the purposes of an opening statement.

Mrs. Rodgers. Thank you, Mr. Chairman.

Our shared goal is cleaner American energy. Our shared goal is to make sure America continues to lead the world in energy innovation. We must make sure our Federal laws and policies will enable, not disable, the affordable and reliable delivery of energy and power.

Keeping the lights on and heating and cooling our homes is vital to health and safety. We saw the heart-wrenching devastation when this goes wrong last month in Texas and the surrounding States. The massive winter freeze extending from the Plains into the south-central States created a record-setting demand for power and heat. And, for a variety of reasons, the ability to deliver energy when people needed it most came up short. Energy managers had to cut off power for millions of people to prevent catastrophic failure of the power system.

During this hearing today, which follows a related Oversight and Investigations hearing earlier today that I think is still going on, we will examine how the CLEAN Future Act's power-sector provisions may affect vital reliability issues. We must ensure that this bill protects energy reliability -- it is a high expectation of all Americans -- as well as protecting families and the jobs of workers from increasing energy cost burdens.

We know an abundant supply of dispatchable, predictable baseload power, whether from fossil, hydro, or nuclear generators, is essential for providing power when

people need it most. Yet the government-driven expansion of wind and solar, weather-dependent energy sources, coupled with electricity market designs that don't fully value reliability, has been driving out baseload generation. There are even dangerous efforts to remove renewable baseload hydropower that is in my district.

The North American Electric Reliability Corporation continues to identify the growing reliability risk as a result of growing reliance on weather-dependent energy. It warned energy managers to take more action to address the risk in its most recent long-term assessment issued in December, including in Texas and California. Ladies and gentlemen, these outages are a reality check.

The Department of Energy released studies last year of previous cold events in the Midwest and New England, finding that additional pipelines and baseload are needed to secure our grid. Yet keeping the lights on is not the central focus of this legislation.

The CLEAN Future Act mandates massive electrification on an unprecedented scale and at an unprecedented pace with no regard for cost. How do you realistically do that without weakening reliability with the timelines in this bill?

Considerations for people's household budgets is also absent. We have already witnessed how aggressive renewable policies in California can't keep the lights on. Those policies will be mandated nationally under this bill. That State's electricity prices have increased seven times as fast as the national average over the past 10 years -- seven times as fast as the Nation's average.

High rates squeeze household budgets needed to pay for heat and electricity, especially when people need it most. Just like we have seen in California and New York too: Add in the push to keep fossil in the ground, and remove gas as a source of heating fuel, and the costs increase even further. This is a one-two punch of electric mandates

that raise prices and undermine rewarding jobs in the energy sector.

This is not the way to build prosperity. We should reset our focus. We should look at making improvements in our energy and electricity systems to place reliable, affordable delivery of energy and power back at the center of our energy policy. We can do this by unleashing innovation through regulatory and permitting reforms for the grid and for systems that use all energy resources.

These are the reforms that the Republicans are leading for in the Securing a Cleaner American Energy Act, and we would like to work together to make it law.

The United States of America is blessed with abundant energy. It is foundational to our energy security and our economic competitiveness. We also have tremendous technological know-how. There should be no reason we have to tell our constituents in an energy emergency that we don't have enough electricity to keep the lights on or the fuel to heat our homes. Let's focus on making sure we can keep that promise and win the future.

And, with that, I yield back.

Mr. Rush. The gentlelady yields back.

The chair would like to remind members that, pursuant to committee rules, all members' written opening statements shall be made part of the record.

[The information follows:]

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

Mr. Rush. Now I would like to welcome our esteemed witnesses for today's hearing. Let me begin by introducing Dr. Karen Wayland, who is the chief executive officer for GridWise Alliance; Ms. Yvonne McIntyre, who is the director of Federal electricity and utility policy for the Natural Resources Defense Council; then Ms. Alison Silverstein, independent energy consultant; next we will introduce Mr. Eric Hofmann, president of the Utility Workers of America Local 132, Utility Workers of America, AFL-CIO.

Thank you for joining us for today's hearing, and we look forward to your testimony.

And now it is my honor to recognize Ms. McIntyre for 5 minutes for the purposes of an opening statement.

Ms. McIntyre, you are recognized.

STATEMENTS OF YVONNE MCINTYRE, DIRECTOR, FEDERAL ELECTRICITY AND UTILITY POLICY, NATURAL RESOURCES DEFENSE COUNCIL; ALISON SILVERSTEIN, INDEPENDENT ENERGY CONSULTANT; KAREN WAYLAND, PH.D., INTERIM CHIEF EXECUTIVE OFFICER, GRIDWISE ALLIANCE; AND ERIC HOFMANN, PRESIDENT, UTILITY WORKERS OF AMERICA LOCAL 132, UTILITY WORKERS OF AMERICA, AFL-CIO

STATEMENT OF YVONNE MCINTYRE

Ms. McIntyre. Thank you.

Good afternoon, Chairman Rush, Ranking Member Upton, and members of the subcommittee, and thank you for the opportunity to testify at today's hearing on "The CLEAN Future Act: Powering a Resilient and Prosperous America."

My name is Yvonne McIntyre, and I am the director of Federal electricity and utility policy at the Natural Resources Defense Council, NRDC. Founded in 1970, NRDC is an international nonprofit organization of scientists, lawyers, environmental specialists dedicated to protecting public health and the environment.

Prior to joining NRDC, I spent over 30 years in the power sector, working first as an electrical engineer and then in government affairs.

Extreme weather events are posing increasing and more persistent threats to our Nation's energy infrastructure. And communities of color and low-income communities are typically the most negatively impacted by these disasters. A prime example is last month's cold weather catastrophe in Texas that led to dozens of death, untold suffering, widespread electricity outages, burst water pipes, and devastatingly high electricity bills.

There were multiple causes of the crisis, but, overall, the Texas catastrophe was caused by lax government oversight. And, as we have seen time and again in our history, the poorest, most disadvantaged paid the highest cost of that failure. Effective government oversight is needed to ensure that the grid operates during times of stress.

We need a 21st-century power system that is responsive to the climate emergency we are facing today. This means utilizing clean, renewable energy and energy efficiency to curb our dependence on fossil fuels. That will cut emissions that are fueling climate change. It also means ensuring that our power system can withstand the extreme weather we are already experiencing by making our grid more resilient and responsive.

The good news is that we have a historic opportunity now to make the investments that will create jobs, modernize our electricity grid, and cut climate pollution. The CLEAN Future Act is an important and ambitious framework for moving the Nation to a clean economy and tackling the climate crisis.

It is a commendable effort but needs to do more to ensure our power system is more resilient and reliable in the face of the worsening climate crisis and extreme weather events like what happened in Texas. To enable a cleaner and more resilient grid, we recommend the Federal Government take a number of steps.

First, we need to jump-start transmission superhighways across and between regions.

We also need to incentivize and expand energy efficiency, distributed solar, storage, energy-efficient buildings, and electrification.

Third, we must unlock the benefits of demand flexibility and distributed energy.

And, finally, it is imperative that we provide assistance and support to low-income

communities and communities of color to reduce the burdens and negative impacts from climate-related disasters and harmful pollution.

Each of these measures would also improve air quality by reducing locally harmful pollution. Congress can and should reduce the toll that pollution takes on communities of color and low-income communities.

And Congress must also ensure that the investments made to transform the power system are targeted toward the communities facing the greatest risk from climate change and those disadvantaged by historic inequities, including paying the largest percentage of their income on energy.

Taking these actions will not only improve the resiliency of the power grid and lead to a cleaner environment, it will also deliver jobs and economic development as well as lower costs for consumers.

The CLEAN Future Act contains a number of provisions that address these issues, but in most cases it needs to go further to improve the resiliency of the electricity system and to drive investment in a diverse portfolio of renewable resources, efficiency, and demand flexibility.

The bill should provide for stronger tools to consider climate change in transmission permitting decisions and to address its lack of planning authority. To take advantage of demand flexibility and enable greater access to distributed-energy resources and electrification, we need major upgrades to our grid. Therefore, the level of CLEAN Future Act funding for such upgrades should be substantially increased.

Building electrification and weatherization are key efficiency tools, but they are not addressed in the bill. There should be a stronger focus throughout titles II and III on providing benefits and support to, and engaging with, low-income communities and

communities of color.

Further details on these recommendations are provided in my written testimony. NRDC looks forward to working with the committee to improve the bill to address these critical issues. Thank you, and I look forward to your questions.

[The prepared statement of Ms. McIntyre follows:]

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Mr. Rush. I want to thank Ms. McIntyre.

And now, Ms. Silverstein, you are recognized for 5 minutes for the purposes of an opening statement.

STATEMENT OF ALISON SILVERSTEIN

Ms. Silverstein. Thank you, Chairman Rush, Ranking Member Upton, Chairman Pallone, and distinguished members of the committee. My name is Alison Silverstein. I am honored to appear before you today as a private citizen with personal experience with the Texas power crisis.

First, about the Texas blackout: Generation on the ground and fuel stockpiled in the yard won't help us if the generator or its fuel supply freezes up. We need a diverse fleet of generation and storage sources that don't all fail at the same time due to common causes.

Texas's critical facilities were not ready with backup power and on-site fuel. Texas's distribution utilities could not rotate outages among circuits and customers once they protected known critical facilities because the big circuits they were serving used up all the available power. Texas leaders didn't use several days of lead time to warn us to get ready for the storm ahead.

But Texas energy uses and demand are also to blame. Too many Texas homes have minimal insulation, so residents can't stay warm in winter or cool in summer without wasting too much energy. Fifty percent of Texas homes use inefficient resistance heating that caused almost half of the ERCOT demand surge on February 14.

This power disaster was an equity disaster. Poor people suffer from energy poverty and live in lower-quality, leaky housing in areas that are most likely to be shut off during a mass load-shed event. They are more likely to suffer misery, medical complications, or death from bad weather and power shutoffs.

This was fundamentally a planning failure by ERCOT, by NERC, by our energy providers, and by regulators at every level. We consistently underimagine and underestimate the magnitude of what could go wrong, so we fail to plan and prepare adequately for very bad events.

Deadly, costly extreme water events are hitting the U.S. with growing frequency and ferocity. We have to stop pretending that each individual extreme weather event is a low-probability occurrence and, instead, treat extreme weather collectively as high-impact, medium-frequency events.

We also need to stop pretending that every type of extreme event is special and deserves its own special preparation. Almost every disaster that harms the grid has a common consequence: the power goes off. Customers don't care what caused it, and neither should we. We should protect our grid, our citizens, and communities against the common consequences of all of these disasters because we can't afford to harden the grid against every threat.

Now, on to the CLEAN Future Act.

On subtitle B, all credible analyses of a reliable, affordable clean-energy future recognize that we need to massively expand electric transmission. Current FERC and DOE authorities and processes aren't working to do that. Newer, stronger physical infrastructure will not appear without a stronger institutional infrastructure to facilitate that.

Please improve our institutional infrastructure by giving FERC more authority over interregional transmission planning, routes and interconnection, benefits, and cost allocation.

Create and fund a Federal transmission authority to manage national-scale transmission planning, design, and construction. This authority should work with others to build a robust interregional transmission network.

Create a Federal funding program to finance much of the needed electric system expansion and improvements.

Please modify the subtitle on infrastructure and resilience by requiring utilities to sectionalize their distribution systems into smaller circuits that can rotate the burden of load-shedding more fairly.

Revise the microgrid provisions to offer standardized microgrid and backup power systems containing photovoltaics, battery storage, and backup generation. These could be deployed economically to critical facilities and used for both community resilience and grid emergency support.

Also, standardize community solar projects to deliver more clean energy to communities using our taxpayer dollars.

On title III, efficiency, don't just make the grid more resilient; make people and communities more resilient as well. To do this, we need to deliver much more energy efficiency to many more Americans at maximum speed.

Last month, leaky homes and wasteful electric heating drove Texas demand very high and then leaked out all the warm air so homes froze and people died without power. We must make immediate, massive investments in energy efficiency and repairs to low-income and multifamily housing using weatherization and more efficient heat pumps

and air conditioners. This will keep people safer during bad weather, reduce energy poverty, speed up decarbonization, and create many jobs. More efficient homes and businesses will also improve grid reliability and resilience.

Thank you all for your service to our Nation, and thank you for the opportunity to testify.

[The prepared statement of Ms. Silverstein follows:]

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Mr. Rush. Now the chair recognizes Dr. Wayland.

Dr. Wayland, you are recognized for 5 minutes for the purposes of an opening statement.

STATEMENT OF KAREN WAYLAND, PH.D.

Dr. Wayland. Thank you, Chairman Rush, Ranking Member Upton, and other members of the committee. Thank you for the opportunity to appear before you today to participate in this important hearing on how Congress can improve the resilience of the electricity grid and the CLEAN Future Act.

My name is Karen Wayland, and I am the CEO of GridWise Alliance. The mission of GridWise is to champion the principles, policies, and investments needed to transform the electricity grid. Our members include investor-owned utilities, municipal utilities, rural electric cooperatives, grid equipment manufacturers and technology companies, vendors, National Labs, and others.

The Texas power failure and last year's wildfires in California have focused public attention on the electric grid and emphasized the growing dependence of all sectors of the economy on reliable electricity. I know the other panelists have discussed in greater depth what happened in Texas and California. My approach is to use those blackouts as the driver for discussions about enhancing grid resilience across the country.

We should not lose sight of the range of threats that could disrupt power supply at the local, regional, or national level. Every utility in every State faces resilient challenges, each requiring different risk management strategies. So let's talk about the

threats to grid resilience.

First, increasingly severe weather threatens power grids across the country. There were a record 22 weather events in 2020 alone in which the cost of the damage exceeded $1 billion. The last two decades have seen a 67-percent increase in major power outages from weather events. Drought is increasing, and five of the worst wildfires in the U.S. history occurred in the last 4 years. Other natural risks are geological, like earthquakes, geomagnetic pulses, and sea-level rise.

Cyber attacks are a constant, increasing, and evolving threat to the electricity system. The growing number of grid-integrated devices and utility-operating technologies that are increasingly connected to utility information technology systems increases the likelihood that a successful cyber attack could significantly damage critical equipment and cause widespread power outages. This is a national security threat that policymakers must tackle, and I urge you to include cyber provisions in the CLEAN Future Act.

Enhancing the resilience of the electricity grid is a multipronged approach encompassing planning, operations, and technology across a range of risks. It is as much about people as it is about the physical grid. Utilities have a suite of options to enhance resilience across the technology, operations, and people spectrum.

On the operations side, trees are the leading cause of power outages. So utility vegetation management programs reduce flammable materials near power lines and remove trees at risk of fall. In the days leading up to an event, utilities will pre-stage trucks and equipment in advance.

On the people side, utilities conduct practice drills and exercises throughout the year to prepare for disaster response and engage in mutual-assistance agreements with

neighboring utilities.

On the technology side, we have numerous hardening approaches and new grid technologies that can significantly increase resilience. And those are dealt well with in the sections of the 21st-century grid in the CLEAN Future Act.

A few years ago, GridWise Alliance brought together experts from the utilities and grid equipment manufacturers to discuss grid resilience in the face of large-scale events like the Texas freeze and the California wildfires. The 20 utilities participating represented over 40 percent of the Nation's electric customers and came up with 4 significant lessons that the CLEAN Future Act touches on.

First, grid-modernization technologies can prevent outages and decrease projected impacts. Second, distributed generation technologies, such as microgrids and DERs, can enhance the resilience of electric infrastructure. Third, information and communications technology infrastructure should be more resilient, reliant, and secure. And for the fourth lesson, from our workshop, enhanced emergency response planning processes can result in better deployment and coordination of human and other resources.

I address a number of these recommendations in my written testimony, and I look forward to exploring these further with you.

One final point on resilience: Planning for energy resilience is not the sole purview of the energy sector. Large-scale disruptions will often affect multiple systems, as they did in Texas with water, and multiple States, affecting assets outside the utilities' footprint and control. Thus, planning must involve coordination between the public and private sectors.

State and local governments are the first and second layers of response planning,

and virtually all States have energy security plans for disaster response. Ideally, these plans should be updated at least annually, but the reality is that most States do not.

Working with industry and other stakeholders, GridWise Alliance has developed a set of grid infrastructure priorities for an infrastructure package or in evaluating the CLEAN Future Act. Our policy framework includes over $50 billion in funding for programs across the Federal Government to support grid modernization, and our recommendations have significant overlap with the CLEAN Future Act.

Federal funding for grid modernization will leverage private capital, accelerate grid-modernization plans, help de-risk State public utility commission decisions, and put people back to work. If Congress makes investments in the Nation's grid in 2021, the electricity sector can be the engine to drive post-pandemic recovery.

GridWise Alliance thanks the committee for the opportunity to provide feedback on how to enhance resilience of the Nation's electricity system, and I look forward to the discussion following. Thank you.

[The prepared statement of Dr. Wayland follows:]

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

Mr. Rush. The gentlelady yields back.

The chair now recognizes Mr. Hofmann for 5 minutes for the purposes of an opening statement.

Mr. Hofmann, you are now recognized.

STATEMENT OF ERIC HOFMANN

Mr. Hofmann. Thank you, Chairman Rush, Ranking Member Upton, and all distinguished members of the subcommittee.

My name is Eric Hofmann, and I am president of the Utility Workers Union of America Local 132, representing over 4,000 unionized workers at SoCalGas, covering over 20,000 square miles of service territory and over 20 million customers.

Now, our members work in every facet that you could possible imagine, from our welders and inspectors on the pipelines to our technicians that service appliances in low-income and underserved communities. We represent our folks in the call center, men and women, many of them single moms. Every walk of life imaginable is who our members are.

Climate change is real and, no doubt, caused by human activity. The question becomes, what do we do about it? We know we need to significantly reduce greenhouse-gas emissions, and that should be the goal. The goal should be to reduce greenhouse-gas emissions.

How do we get there? We are going to need wind. We are going to need solar. We are going to need lithium ion battery technologies. But we are also going to need

renewable natural gas. We are going to need hydrogen. We are going to need carbon capture, utilization, and sequestration. And we are going to need pyrolysis. We are going to need all of it.

We are going to need to include workers who work in these spaces, who are the true experts on these energy systems. And they should have a voice and a seat at the table. They are the ones who are best-served to explain to you all how to best move forward and get our energy systems dramatically decarbonized.

When we talk about building electrification, building electrification presents some of its own challenges, particularly the solution on offer right now with heat-pump technologies. The heat pumps contain refrigerants, currently R-410A, which is 2,100 times worse than CO2, particularly on the production side. There are other issues with these heat-pump technologies in the ducting and the other wiring and electrical components required in order to upgrade these systems.

So, when we talk about decarbonizing, as far as UWUA Local 132 is concerned, it does not mean mandating electrification. We need to get there, and the way we get there is by exploring every option available and keeping all of our options at our fingertips.

One of the other big problems you are going to find with electrification is the renewable space that we currently have. In southern California, the largest solar field has a dedicated natural gas line in order to keep the panels heated during the night and in the cold, so when the sun comes up in the morning, there is no condensation on the panels, so they are moving at full capacity.

So we need to take all of these things into consideration, particularly with our housing crisis in California, and we cannot make things less affordable. We have to try

to keep energy as affordable as it can possibly be. Energy should not be a luxury to only the affluent. Energy should be available to everyone.

In closing, I will just say that, regardless of what letter you have in front of your name, it is not lost on me for what you guys do, and I am sure more often than not it is a thankless job. So let me just say thank you for what you do and your leadership. And I appreciate your line of questioning.

Thank you.

[The prepared statement of Mr. Hofmann follows:]

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Mr. Rush. I want to thank all of our witnesses.

We have concluded our opening statements. We will now move to member questions. Each member will have 5 minutes to ask questions of our witnesses.

And I will start by recognizing myself for 5 minutes.

Ms. McIntyre, in recent years, extreme weather events have posed a significant threat to our Nation's critical infrastructure. A recent GAO study suggests that climate change will have far-reaching impacts on our Nation's electric grid.

Would you describe why you think it is important to swiftly invest in a 21st-century energy system and, in particular, how this investment will allow us to respond to climate change?

Ms. McIntyre. Thank you, Congressman.

We definitely agree with GAO's assessment and certainly do believe that the extreme weather threats being caused and fueled by climate change are certainly, you know, causing more and dramatic impacts on our energy system.

And so we believe -- and, again, as I go into in my written testimony -- that there are a number of steps, some that are included in the CLEAN Future Act, that will address and hopefully make the grid more resilient and reliable.

But, you know, action needs to be taken now. And foremost, at the top of that list, is decarbonizing our grid. We need to move away from fossil fuels that are fueling the climate crisis, and so we need more access to renewable energy, energy efficiency, storage.

We also need to expand our transmission grid and strengthen transmission interconnections; you know, take other efficiency measures, such as weatherization,

electrification.

And so, you know, a whole host of steps that, again, I go into in more detail in my written testimony.

But the time is now. We can't continue to hold off on making these investments and transforming our grid. You know, we need to move away from fossil fuels now to, you know --

Mr. Rush. Thank you very much.

Ms. McIntyre. -- lessen the impacts of climate and --

Mr. Rush. Yes. I only have a few more minutes. Thank you, Ms. McIntyre.

Ms. McIntyre. Okay. Great.

Mr. Rush. Dr. Wayland, in your testimony, you mentioned that we must not lose sight of the range of threats that could disrupt power supply at the local, regional, or national level. In addition, you mentioned that resilient grid infrastructure requires a range of risk management strategies.

How might policies to enhance Federal investment in grid resiliency support a range of risk management strategies?

Dr. Wayland. Thank you, Congressman.

We believe that helping to accelerate grid modernization is one policy that the Federal Government can take to enhance the resilience of the electricity system. Deploying grid technologies actually gives the grid operators a greater flexibility in terms of dealing with a range of threats and also allows them to take more advantage of the demand-side assets -- buildings, vehicles, water heaters, other things.

And in the energy-efficiency provisions in the CLEAN Future Act, we strongly support energy efficiency, but we would recommended that, if the bill passes, that would

result in an enormous upgrading of buildings around the country, millions of buildings. And during that construction, those buildings should have advanced energy management systems installed that could be grid-integrated and allow those buildings to become assets to the grid that grid operators can use to provide additional grid services and manage loads better across the grid.

I would also say that giving tools to utilities and to policymakers to value grid resilience is very important. And continued support for the Department of Energy and the National Labs' work with stakeholders on evaluation of grid resilience will be very critical to justify those resilience investments.

Thank you.

Mr. Rush. Thank you.

Ms. Silverstein, communities like the First District of Illinois also experience extreme weather and summer weather events. Given your experience in both the national and Texas-specific grid policies, would you describe how policies from the CLEAN Future Act might support Federal efforts to secure vital grid infrastructure in a variety of communities?

Ms. Silverstein. Yes, sir. Thank you.

The most important thing that I recommend is measures that work in Texas or in Chicago, in all of your States, and those are: Don't just protect the grid; protect people and make people more resilient.

And what that means is taking the benefits of things like distributed generation and backup power systems and putting them at critical facilities so that they serve everyone and support the grid, and doing essential energy efficiency as widely as possible for as many people as possible.

Because not all of the shiny things that Ms. Wayland advocates will work all the time, particularly given potential disruptions to communications and cyber attack. So I want to make sure that people are protected by safer homes and buildings that keep them safe, no matter what, wherever their weather happens to hit them.

Thank you.

Mr. Rush. That concludes my questions.

The chair now recognizes my friend from the great State of Michigan, Mr. Upton, for 5 minutes.

Mr. Upton. Again, thank you, Mr. Chairman. I have a number of questions.

I appreciate all the testimony.

Ms. Wayland, we -- I have to say, all of us support grid modernization. We have had a number of hearings over the last good number of years, whether it be on cyber -- obviously, what we saw in California and Texas is not where we want to be.

How much do you think that we need to spend on grid modernization? And what would be the leverage that we would be able to get, do you think, from the utilities themselves to help out with the cost? What is a ballpark figure in terms of what we are going to need?

Dr. Wayland. Ballpark, we are recommending a suite of recommendations for about $50 billion of Federal investment. But that is across a range of direct grid technology deployment, to resilience measures like microgrids, for cybersecurity and other things. And I am happy to share with you our "Grid Investments for Economic Recovery" proposal.

You will get significant leverage from utilities in these investments. In fact, the investor-owned utilities don't want free money from the Federal Government. They

need to be able to make their own investments here.

But I do think that the Federal investments would help accelerate grid modernization. We have seen a number of public utility commissions take a very hard look at grid-modernization plans for a number of reasons but particularly because of the economic downturn of the last year. And so Federal funding would certainly help accelerate the regular investment plans that are out there for grid modernization.

Thank you.

Mr. Upton. And, you know, we have heard a lot over the years about the trouble in permitting for new grids, for new lines. Do you support any permit modernization or reforms that could be part of this package?

Dr. Wayland. We do believe that there is a mismatch between the permitting for generation and the permitting for transmission and that we need to look at a range of policy options to accelerate our ability to both build new [inaudible] and to upgrade existing facilities to make them more efficient and to build their capacity.

Mr. Upton. And for the record, can you provide some of those recommendations for us?

Dr. Wayland. I -- yes. We --

Mr. Upton. Great. Thank you.

Dr. Wayland. -- particularly around -- sorry.

Mr. Upton. That is the answer I wanted to hear. Thank you.

Dr. Wayland. Yes, I will provide them for you.

[The information follows:]

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Mr. Upton. Great.

And, Mr. Hofmann, you mentioned in your testimony that you represent thousands of utility workers. There are some 20 million people in southern California.

What are some of the greatest challenges for your workers? And what keeps you up at night as you prepare for yet another summer in California with a growing risk of wildfires and perhaps rolling blackouts? What can we do today to help your job a few months from now?

Mr. Hofmann. Sure. So, you know, in regards to, you know, this summer and wildfires, you know, mudslides in the winter, earthquakes, all of these things that happen, these sort of major, catastrophic events, my members, quite frankly, they call it a Tuesday. And that is what they are up against.

And, you know, when we talk about what can we do today, there is -- and in terms of impacts on reducing greenhouse-gas emissions, we have a system of leaky pipes that we could be fixing right now. We could work on this.

You know, Local 132 was the first of its kind to enact legislation here in California in SB-1371 to actually adopt a find-it-and-fix-it approach to natural gas leaks that have been deemed nonhazardous by the public utilities commission in terms of their likelihood of ignition --

Mr. Upton. And what is your backlog? I don't mean to interrupt, but what is your backlog on the find-it-and-fix-it?

Mr. Hofmann. Well, you know, when -- I am not certain, but I know that it is in the thousands.

Mr. Upton. Thousands of individual leaks?

Mr. Hofmann. Yes.

Mr. Upton. Wow. That would do a lot.

What is the reaction from your membership for those that say, well, maybe we can find you another job in a different sector of energy, maybe at the same salary? What level of skepticism is there as it relates to that?

Mr. Hofmann. Off-the-charts high, quite frankly. When we hear the term "just transition," quite frankly, it makes our skin crawl, because we have not seen any example of anything that is that, "just."

I worry about, you know, our newest member who signed up last week; you know, what does that mean for his career going forward? What about people that have 20 years? What about their retirements and everything else and their families? There is a lot for us to consider there.

Mr. Upton. And let me just -- is there a log for the find-it-and-fix-it? Can we find out the specific number of cases that might be open in California that need to be addressed, through the public service commission or somebody else?

Mr. Hofmann. Yeah. The California Public Utilities Commission, certainly, yeah. It is under SB-1371, Senator Leno.

Mr. Upton. Okay. Thank you.

I yield back. Thank you for the time.

Mr. Rush. The gentleman yields back.

The chair now recognizes the chairman of the full committee, Mr. Pallone, for 5 minutes.

The Chairman. Thank you, Chairman Rush.

I wanted to ask some questions about transmission. One issue that the Texas

energy crisis brought to the forefront is whether ERCOT would have benefited from having more transmission connections to the rest of the U.S. grid.

And, during the storm, Southwest Power Pool, the electric market north of ERCOT, and the Mid-Continental Independent System Operator, the electric market to the east of ERCOT, were able to rely upon energy imports from the rest of the grid even though those markets still experienced some shortages.

So let me start with Ms. Silverstein.

How could ERCOT have benefited from greater transmission connections to the rest of the U.S. grid during this severe winter storm? If you will.

Ms. Silverstein. Yes, sir. ERCOT could have benefited in a couple ways.

One of them is, just because the other -- there would have to be significantly bigger interconnections than exist today, of course. But just because another interconnection is wrestling with its own winter weather doesn't mean there is nothing left for them to share.

And so there are significant benefits for potential additional flows and, more important, had ERCOT actually gone into black start, though it is much easier to restore a grid being able to import power from elsewhere than it is only to depend on your own internal resources. So we could have avoided a multiweek potential collapse of the entire Texas economy had Texas had interconnection to support black start.

The Chairman. Well, thank you.

Now, the CLEAN Future Act contains a suite of new provisions that enable responsible build-out of the electricity transmission system. So, obviously, you know, we think that that would help in terms of what you just discussed.

But let me go to Ms. Wayland.

Why is a robust transmission system so important for grid reliability and resiliency?

RPTR WARREN

EDTR HOFSTAD

[3:07 p.m.]

Dr. Wayland. Well, a robust transmission system means that it is able to respond quickly to changes across a large geographical area. And so you are actually able to balance load and supply across, you know, areas with different geographical conditions.

So, in an event like a storm, where you might have excessive demand, or extreme heat like we had in California, you can call on power from different parts of the country and actually balance it better than you would if you have a system that is not as expansive.

So that is one way to think about a robust transmission system.

The Chairman. I mean, I know that even from listening to the debate this morning in O&I that, you know, many of our Texas members sort of pride themselves on the fact that Texas is on its own and, you know, can do everything on its own. And I understand that. Everybody has a sense of pride in their State, and certainly Texans do. But, I mean, I think that it is clear that if they were better hooked up to a national grid that there would have been a better opportunity to prevent this from happening, or at least it would have been lessened.

Let me ask Ms. McIntyre, will we be able to achieve our clean-energy goals without building out the transmission system to access renewable energy sources?

Ms. McIntyre. No, we will not. You know, having stronger and more expanded transmission provides more access to clean-energy resources where they are generating electricity and being able to take that power to where it is needed.

And so, you know, right now, like, Southwest Power Pool, actually, the majority of

its generation is actually wind power. And so, you know, in an overabundance of wind power, you know, to have the ability to actually get that power to where it is needed, particularly in times of storm and severe weather, is going to be essential.

It will also provide -- expanded transmission will provide the balancing of intermittent renewable resources, again, because, you know, if you are experiencing, you know, low wind levels in one State, that doesn't mean that, you know, the same level of activity is happening in another State. So, if the wind is blowing in one State, you can move it to another State if you have stronger transmission ties.

So I know there is a lot of concern that people raise about the intermittency of renewable resources, but, you know, having an expanded and stronger transmission system will allow the balancing to be enabled to provide renewable power throughout the country.

The Chairman. Well, thank you.

Yeah, I just want to stress, I know we have talked a lot about Texas today, but modernizing the grid and expanding transmission are important for reliability and resiliency in all the States. And I just think there are also critical activities we have to undertake to enhance the movement of clean electricity across the country to ensure a reliable source of supply and to meet our net-zero-carbon energy goals.

So thank you again, Mr. Chairman.

Mr. Rush. The gentleman yields back.

The chair now recognizes the ranking member of the full committee, Mrs. Rodgers, for 5 minutes.

Mrs. Rodgers. Thank you, Mr. Chairman.

Mr. Hofmann, I want to join in just saying thank you for being with us today and

sharing your important perspective. I think it is really important that we get that on-the-ground perspective, especially from California and as someone that is working every day to ensure that we have safe and reliable energy.

You talked in your testimony about, quote, "working to optimize the natural gas and gas infrastructure, not minimize or eliminate it." And I think that we want to do the same thing. We want to build, not destroy. We want to improve our energy systems using all our resources and really looking at how we can make these resources cleaner. We want to do it sensibly, and it takes time for that innovation.

My opinion is that the problem with the CLEAN Future Act is that, with the timelines and the one-size-fits-all mandates and the centralized planning, it makes no room for this.

So, Mr. Hofmann, you state in your testimony that decarbonization does not mean building electrification. Would you just tell us why and why it isn't necessarily ideal for families and workers?

Mr. Hofmann. Certainly.

So, when you talk about, you know, building electrification, you know, it is, what is the goal? And if the goal is reducing greenhouse-gas emissions, then there are, quite frankly, more cost-effective, more efficient ways to get there.

For example, you know, going into low-income and underserved communities and replacing their old, quite frankly, junky appliances with more state-of-the-art natural-gas/electric appliances, you know, that will decrease your energy consumption; therefore, you are reducing greenhouse-gas emissions.

You know, talking about, you know, this whole prospect of making everything electric, you are going to leave a lot of people in the dark that can't afford to transition

over. And I think from a sense of, you know, just cost-efficiency measures, we would all be better served, from our perspective, in repurposing and refurbishing rather than recapitalizing everything.

Mrs. Rodgers. Okay. I appreciate that.

And another title is -- and one that I think is actually pretty chilling in this legislation is the worker transition title, which makes plans for the loss of these energy and energy-intensive jobs expected from the bill.

Would you speak to what goes into your work and what it means to you and your colleagues to build the skills that you have and perform the jobs that you do?

Mr. Hofmann. Certainly. Thank you for that question.

You know, we secured our first bargaining unit here at Local 132 in 1938, and it is a craft that we have been perfecting every since. I am a second-generation utility worker, and I am proud of it. And these skills that we have honed and perfected over, you know, decades and generations -- we are not robots, and we can't just simply be reprogrammed to do a completely separate skill. It is just not realistic.

And rather than, you know, focusing on things that are largely aspirational, from our perspective, it makes more sense to work on things that are actually achievable.

Mrs. Rodgers. Yes. So what do you think when D.C. is talking about the other occupations that they can train you to do?

Mr. Hofmann. You know, from what I have seen -- I mean, I have seen, for example -- you know, one example is that an environmental attorney is considered a green job. And, quite frankly, that is just not really an occupation that I see a lot of my members transitioning into.

And, you know, there are other examples that I see real challenges with also.

You know, even the aspect of the additional components needed on the electrical system, what would be required would not -- they would not require all 4,000 of my members and however many thousands of other gas workers in the State would be needed to come over on the electric side. It is just not realistic.

Mrs. Rodgers. So another concern I have with California policies becoming our country's policies is the cost. And we know that California has seven times the cost of the national average.

And now the Governor is proposing to eliminate the sales of light-duty, gasoline-powered vehicles. And that also is coming to D.C., where the two California Senators are asking for that to happen nationally.

Would you speak to working-class communities and if you think that they will benefit from the ban of these gas-fueled vehicles?

Mr. Hofmann. You know, it is kind of a difficult question. I mean, you know, considering that, you know, tailpipe emissions, you know, cars, suggested that they contribute to, you know, roughly nearly 40 percent of all greenhouse-gas emissions, I mean, that is probably the best sector to work in, but, again, you have a lot of things to consider. How are people going to afford these new technologies that, from what at least they are right now, they are very expensive?

Not to mention the fact that, what would happen today if every single person who owned or drove a car in California plugged in their car at night? You know, there are some challenges there that I think a lot of people need to consider. And, you know, from our perspective, the best people to talk to are the ones who are actually going to have to do that work.

Mrs. Rodgers. Thank you. I really appreciate you being with us.

I yield back.

Mr. Rush. The gentlelady yields back.

The chair now recognizes Mr. Peters for 5 minutes.

Mr. Peters. Thank you, Chairman Rush, for convening this hearing today.

The Oversight and Investigations Committee, as you mentioned, held a hearing this morning on the power crisis in Texas. And while the Texas grid failed for a combination of reasons unique to Texas, the extreme weather that triggered the near-grid-wide blackout was not a unique event. We have seen grid vulnerabilities in other places, including my home State of California.

That is why titles II and III of the CLEAN Future Act are so important and timely. And I am especially grateful to the committee chairs for including language from my bill, the POWER ON Act, which encourages the siting of new interstate transmission lines to increase overall capacity, reliance, and resilience and lower electricity costs to consumers.

According to research from the Department of Energy's National Renewable Energy Lab, if we connect centers of high renewable resources with centers of high electric demand by building a macro grid -- that is, an overlay of high-voltage DC lines -- and optimize that grid for the Nation's best wind and solar, we can dramatically reduce carbon emissions while improving system resiliency and reducing wholesale power costs.

And, Ms. McIntyre, I appreciate you referencing this concept in your testimony. And I would like to ask you and then maybe Ms. Silverstein: Electrifying everything is one key component to GHG emissions-reduction strategies. This would require additional transmission to bring clean energy from rural areas to our population centers.

Would it be a good strategy or would it not be a good strategy to site transmission

along highways and railways, with the aim of supplying charging infrastructure along the routes, while maximizing existing rights of way?

And Ms. McIntyre and then Ms. Silverstein.

Ms. McIntyre. Yes, I think that would be a good idea. You know, any different ways that we can expand and strengthen the transmission system to do exactly what you are saying, to help enable, you know, bringing more clean resources and lowering consumer costs, are good proposals to investigate. So thank you.

Mr. Peters. Ms. Silverstein?

Ms. Silverstein. It is a wonderful proposal, and I recommend that you supplement that with an extensive amount of storage. As folks who are not fans of renewables are quick to point out, the sun doesn't always shine and the wind doesn't always blow. So the more that we can support renewables with not only large amounts of transmission but large amounts of storage, distributed in places like charging stations, the better we can support all of those uses.

Thank you.

Mr. Peters. Great.

A background grid is also a key to integrating low-cost zero-emission resources. Given that Order 1000 interregional coordination is not a requirement for planning, and only listed pairs of Order 1000 planning regions, should we conduct interconnection-wide or nationwide planning outside of that process? Or does it make sense to reform that process to bring broader regions to plan together?

And I will ask the same two individuals to comment, Ms. McIntyre and then Ms. Silverstein.

Ms. McIntyre. We definitely think that FERC should be given the authority to

improve the interregional transmission processes and have it be a requirement that utilities in the region be involved.

Mr. Peters. Okay.

Ms. Silverstein?

Ms. Silverstein. I concur.

Additionally, though, I recommend that you not only give FERC more authority over that but that you additionally create a Federal electric transmission authority. Because we know that RTOs, individually, are incapable, it appears, of looking much beyond their boundaries effectively. And so we need much better definition of the benefits, we need much better cost allocation, as well as planning processes.

Thank you.

Mr. Peters. And, to be fair, that would be what you would expect out of RTOs, not necessarily to look nationwide. I think that is why --

Ms. Silverstein. They are doing a great job at what their job is, but we need more than that.

Mr. Peters. Exactly.

And, finally, Ms. Silverstein, we are likely to see more and more of these extreme weather events, and that demonstrates we need to improve resilience. But someone on the other side of the aisle had been suggesting that the Texas energy crisis is an opportunity to cast blame for the California blackouts on renewables.

Can you give me your perspective on that? What do you say to people who say they can't run a grid reliably and keep the lights on if we rely on an increasing amount of renewable resources?

Ms. Silverstein. I think they are wrong. California was demonstrably not about

the failure of renewables alone; California was about the failure of all kinds of resources and climate change. Texas was about climate change, an extraordinary weather event, and the failure of every kind of generation and every kind of customer demand problem. So, if there was a way to screw up this Texas event, we found it, and they all happened simultaneously.

But every complicated weather event and every grid failure is going to have multiple parents and multiple causes. So you can't just say renewables were the cause of either of those events.

Mr. Peters. Great.

I really appreciate the testimony.

Mr. Chairman, I know my time has expired. I yield back.

Mr. Rush. The gentleman yields back.

The chair now recognizes Mr. Burgess for 5 minutes.

Mr. Burgess. Thank you, Mr. Rush.

So we all take it for granted that if you walk into a room or flip the light switch the lights will come on. But, as we learned in Texas and the recent blackouts in California, it certainly shocked, no pun intended, many of those constituents, and it caused many of us to realize just how fragile our electric system can be.

We can all agree on cleaner energy production, and it should be a priority. But, when drafting Federal policies, Congress must not assume that every electron is as reliable, as affordable as the one before. The resource of electricity has positives and negatives -- again, no pun intended. A diverse portfolio of energy generation is integral to achieve the competing priorities of energy reliability and environmental stewardship.

I think Republicans on this committee are ready to work across the aisle to

modernize our energy sector, to ensure reliable, affordable energy that is easily accessible, and to increase American energy exports. But the majority's CLEAN Future Act poses significant risks to those goals.

I also would like to mention, just on the issue of transmission, Texas underwent a rather ambitious -- they were called the Competitive Renewable Energy Zones. And the idea was to get the energy, the renewable energy, from the wind farms in west Texas to where the consumption took place in Dallas and Austin and points east.

I know this because many of those transmission lines crisscrossed the district that I represent, and there was considerable angst at the time of their construction. It was about a $7 billion price tag that will be paid for by rate-payers over the next several, several years. But it is like anything else; you start building a major electrical transmission line, even in a State as large as Texas, and you don't have to go very far before you bump up against someone who would just as soon not have it there.

So, while I appreciate the comments that have been made about modernizing transmission, in fact, Texas, which many people have held up as not the best-case scenario, Texas made a significant investment in getting electricity from the wind fields of west Texas to the areas of consumption in the more populated eastern part of the State.

But let me ask Karen Wayland just very briefly, does the CLEAN Future Act improve the resiliency of America's fuel infrastructure?

Dr. Wayland. I believe it does. And when you talk about fuel, we think of fuel in a range of ways. It is not just -- you know, I think you might be thinking of natural gas. We are thinking of fuel in terms of all of the energy sources that can generate electricity. And --

Mr. Burgess. Yeah. Texas is all-of-the-above, for a fact.

Dr. Wayland. That is correct.

And I think that, you know, we have been talking about the grid today, and we should be talking about the electricity system and then the grid. So, in Texas, the issue was not the grid, necessarily. It was the generation that is connected to the grid. And Texas didn't necessarily represent an engineering failure of the grid itself.

So, you know, it was much more about a failure of generation capacity across all fuel sources, as well as, you know, as Ms. Silverstein has mentioned, market issues and the end-use issues of failure to really invest in the efficiency and the weatherization of the end use as well.

Mr. Burgess. Well, Texas is a big State. As we learned in the other hearing, the weatherization, it is not that it didn't happen; it is that it didn't happen everywhere to the same degree that some people thought it should.

Look, on the issue of Texas being its own system -- and, again, I referenced this in the other hearing that we had in Oversight and Investigations -- the electricity outage occurred at 1:00 a.m. on a Monday morning. Saturday, Texas was buying power from the Southwest Power Pool and was buying power from northern Mexico. I presume that is because Texas was paying a premium for that power. But when the weather got cold in Texas, it simultaneously got cold in those other places, and they no long had power to sell.

So, again, it came up in the other hearing, and I do feel obligated to point out, there is a limit to how much energy you can import if everyone is using their system to the maximum. It is something that you want to be able to plan for but you can't always plan for it. And as I asked the head of NAERC in the last hearing, I said, is there any system in the country that is completely weather-proof? And his answer was, no, there

is not.

Thank you, Mr. Rush. I will yield back to you.

Mr. Rush. The gentleman yields back.

The chair now recognizes Mr. McNerney from California for 5 minutes.

Mr. McNerney. I thank Chairman Rush for holding this hearing.

And I thank the panelists for your testimony today, including the background on the situation in Texas.

My colleagues across the aisle have attempted to identify the failures in Texas with those in California, but there are some similarities -- namely, that climate change is making both situations worse -- but they are really two separate challenges.

This committee held a hearing on California blackouts last Congress, and we discussed the challenges the California grid faces. But my Republican colleagues seem determined to falsely blame the outages on renewable resources, but the real cause is the new normal of massive wildfires every season. Similarly, extreme cold was the immediate cause of the Texas outage. But the underlying cause in Texas was the unprepared utility system.

Worse, these extreme events are -- they are not going to stop. They are going to get worse year after year. This is the new normal, so we have to be prepared.

Ms. Silverstein, what are the challenges unique to Texas in terms of making their grid more resilient? And what do we risk missing by not attempting to fully understand the Texas situation on its own?

Ms. Silverstein. Texas is -- I am going to get drummed out of the State for saying this, but Texas isn't as special as we like to think it is, and the challenges that we face in Texas aren't all that different from every other State. We deny risk. We

underestimate what could go wrong. We are not creative to imagine how bad storms and other threats could be, and so we underinsure and underprepare.

Texas, like everywhere else, is not investing enough in generation, we are not investing enough in transmission, we are not investing enough in flexibility capabilities, and we are just not ready to deal with all the stuff that is coming at us.

Mr. McNerney. Well, that sort of the sounds like what everyplace in the country ought to be doing.

Ms. Silverstein. Exactly.

Mr. McNerney. You know -- and I know you already answered this question, but I want to hear it again. Are renewables the cause of what happened in California and in Texas?

Ms. Silverstein. They absolutely are not. They absolutely are not.

In Texas, every single resource failed.

In California, they were just 500 megawatts short. Actually, they did outages in California because load was unprecedented high, not because resources were necessarily short, and they were following the rules about being careful.

Mr. McNerney. Thank you.

Ms. Karen Wayland, one of the ways we can modernize the grid is by investing in smart grid technology. Can you please explain the importance of smart grid investments and how they can help in the context of grid resilience?

Dr. Wayland. Yes. Thank you, Congressman. And thank you for co-chairing the Grid Caucus with Congressman Latta. We appreciate interacting with you over the years at GridWise.

You know, grid modernization is essential for increasing resilience. These new

grid technologies have been proven to significantly increase resilience. Sensors can alert grid operators to downed lines; they can allow a more targeted response.

We now have automated grid equipment that can sense and respond to conditions immediately, including rerouting power around downed lines, and self-healing capabilities. We have remote sensing in the planning process. We can use remote sensing and NASA satellite imaging to better target vegetation management and to assess damage.

I particularly am interested in modern utility communication networks that can improve operational speed and visibility for grid operators; and the kinds of smart energy management systems, both in the buildings and vehicles, so that they can become assets to the grid; and also the kind of data analytics that grid operators can use to kind of figure out what is happening on the grid, increase visibility, and improve their ability to balance electricity across the system.

Mr. McNerney. Thank you.

With a "yes" or "no," would authorization of the Smart Grid Investment Matching Program be helpful for increasing our grid utility resiliency efforts?

Dr. Wayland. Yes.

Mr. McNerney. Thank you.

I would be remiss if I didn't recognize Yvonne McIntyre. It is good to see you and that you are still in the energy sector.

Yvonne, you said that the Texas power failures were caused by lax government oversight and regulations. Do you have specific recommendations on how to improve the situation so we will be avoiding future calamities?

Ms. McIntyre. Thank you, Congressman McNerney, and it is good to see you as

well.

So the lax government oversight was a combination of, you know, State, local, and Federal Government oversight. And so we believe that there should be standards implemented at the Federal level through NERC for weatherization efforts and also taking into account in every step of the way the impact of climate change through permitting decisions and build-out of our energy infrastructure.

I think that there should be greater standards for weatherization for building codes. You know, a lot of what happened in Texas could have been less dramatic if there had been less demand on the energy system through home and building energy demand.

We believe that, you know, again, there should be stronger ties between Texas and the other grids. I know Congressman Burgess mentioned that there was power flowing between SPP and Mexico, but the problem is that they don't have strong transmission ties between the other grids. So, while, yes, some power can flow, the amount of power that was needed to help offset the outages in Texas were lacking. So stronger grids, stronger interconnection would have also helped Texas.

Mr. McNerney. Thank you.

Well, I have gone way over my time, Chairman, and I yield back.

Mr. Rush. The gentleman yields back.

The chair now recognizes Mr. Latta of Ohio for 5 minutes.

Mr. Latta. Well, thank you, Mr. Chairman.

And thanks to our witnesses today for appearing before this committee.

And before I get to my questions, I think it is important for us to call attention to the fact that the American energy renaissance we have experienced over the past 15

years would not have been possible without the millions of hardworking Americans who work in our energy industry. Workers in sectors like oil, natural gas, nuclear, coal, propane, solar, wind, hydro, and biofuels have put the United States in a position to lead the world in cleaner and more efficient energy production.

My fear is that all this will go for naught and the livelihoods of the these Americans will be threatened if we follow the majority down the path of increasing burdensome government mandates in certain sectors of our energy industry.

The data has shown that we don't need to take this approach. For example, emissions have fallen by more than 20 percent on a per-capita basis since 2005, the largest decrease in the world, thanks to the advancement of hydraulic fracturing and the emergence of American-produced natural gas as well as more energy-efficient products. This proves that we can pursue our goal of reducing current emissions while also preserving and growing jobs in the energy sectors.

And I am also proud of the fact that I have First Solar in my district, and they are a global leader in solar panel production.

Mr. Hofmann, if I could start my questions with you. In your testimony, you talk about that we shouldn't be looking at prematurely picking preferred fuels and technologies and that physical and commercial structures that link sources and sinks risk setting us back in reaching our decarbonization.

And you go on to state that, you know, you advocate for a policy to optimize the use of natural gas and gas infrastructure, not minimize or eliminate it.

Could you talk a little bit about that, please?

Mr. Hofmann. Certainly. Yeah, thank you for that question.

You know, here at Local 132, our perspective is that we are better served in

achieving reductions of greenhouse-gas emissions by optimizing the existing natural gas infrastructure. You know, energy moves in the space of molecules or electrons. And so, you know, when we talk about our natural gas system, that infrastructure is already there.

And by introducing blends of hydrogen, advancing more optimizations levels in renewable natural gas, carbon capture, utilization, and sequestration, these are the spaces in which that infrastructure, for the most part, is already in place. And we can dramatically reduce the carbon outputs, all the way to the burner tip, by implementing and having greater emphasis in these spaces.

And as far as achieving those climate goals, from our perspective, we are better served repurposing and refurbishing that, rather than throwing the baby out with the bath water and saying everything just has to be all electric. From our perspective, we don't think you can get there without these other spaces.

Mr. Latta. Well, thank you.

Dr. Wayland, I want to switch gears and talk about grid security and cyber threats, as you and I have discussed before, and about the threats to the grid from cyber attacks. And that is why I have worked with my friend and colleague, Mr. McNerney from California, on two bipartisan bills to address this issue, the Cyber Sense Act and also the Enhancing Grid Security Through Public-Private Partnership Act.

Given the threat to grid resiliency, shouldn't more attention be paid to cybersecurity and solutions like these two bills that tackle the problems we might be facing?

Dr. Wayland. Yes, absolutely. And I understand that there are jurisdictional issues that complicate Congress tackling cybersecurity, but it truly is a national threat.

We know every day that our utilities, not just electricity but water and gas, are being probed by, not the guy sitting in the basement, but hostile, you know, states. And this is a really critical, critical issue for Congress to tackle, and we urge you to do so and are happy to help you in any way to make that happen.

Mr. Latta. Well, let me just follow up with you again. You know, I talk with a lot of power companies, and, you know, protecting the grid from cyber attacks is so important. Do you think that that is an item that the general public understands out there, how much the grid is subject to attack?

Dr. Wayland. I don't think they do.

And I also don't think they understand that as we increasingly add digital equipment that can interact with the grid that we are actually increasing the threats even further. So, you know, as we plug things into the grid, we are increasing the access points for cyber attacks to disrupt the grid, from the distribution system all the way up to the transmission system.

So I don't think the public fully understands. But I do think that the SolarWinds attack and other things have started to capture the attention of the public.

Mr. Latta. Well, thank you very much.

And, Mr. Chairman, I yield back the balance of my time, and I think I have run over, but thank you very much for your indulgence.

Mr. Rush. The gentleman yields back.

The chair now recognizes the chairman of the Environmental Subcommittee, Mr. Tonko, for 5 minutes.

Mr. Tonko. Thank you, Chairman Rush.

Dr. Wayland, I want to echo your support for Federal investment in grid

modernization, but I also want to ask you about the role for distributed generation. Thinking back to the experiences in my home State of New York, in some places, distributed generation was able to keep the lights on during situations like Superstorm Sandy.

How can distributed generation contribute to the resilience of our energy system, especially around critical facilities?

Dr. Wayland. Yes. Well, there are a couple ways.

One is that, obviously, if you have your own capacity to generate if something happens on the grid, then you are able to power your home.

And there are a couple of things that are going to be critical there which we should consider in the CLEAN Future Act. One is that, you know, storage, individual storage, has to be a component of distributed energy resources. And the other thing is that, if the power goes out, for many people who have solar on their rooftop, their solar power is not going to power their house, because, without a smart inverter, that power would go out into the grid and it automatically shuts off so that it doesn't electrocute line workers. So, if we really want resilience for individuals who have solar power, we have to talk about storage and inverters as well.

And then micro grids and distributed generation, distributed generators, mobile generators, are also critical for -- and those are less likely to be, you know, in an individual's home, but around large critical facilities like hospitals, like universities and schools that can become shelters. So those are critical aspects of resilience as well.

Mr. Tonko. Thank you.

The CLEAN Future Act includes a bill that I worked on during the 116th Congress to develop a national standardized model permit that local governments could adopt to

streamline distributed generation build-out.

So, Ms. McIntyre, do you think this is a good idea? Are there things we can do to lower the existing barriers to distributed generation deployment, including reducing permitting costs?

Ms. McIntyre. Yes. Thank you, Mr. Tonko. And, definitely, we believe that those measures that have been included in the bill would be beneficial for enabling access to distributed generation, and resources are much needed to provide this transformation, so thank you.

Mr. Tonko. Well, thank you.

And while I support an increased role for distributed generation in our energy mix, in order to achieve the ambitious goals in the CLEAN Future Act, we are going to need a lot more utility-scale renewables. These projects are often geographically constrained, and we are going to need new high-voltage transmission infrastructure to maximize the potential of our Nation's low-cost renewable resources.

So, Ms. Silverstein, your written testimony mentioned that all of the benefits of high-voltage transmission are rarely acknowledged. Can you discuss what these are? I am guessing it is a combination of emissions reductions and reliability and resilience, perhaps?

Ms. Silverstein. It is those things. It is also lowering costs and increasing access to preferred resources. Many customers prefer renewable resources and low-carbon resources and they can't get them.

It is creating much stronger connections between interconnection and between regions to enable more power flow. This is what improves the reliability of the grid overall and lowers the costs for delivered energy to all Americans, not just to those who

sit right next-door to a renewable generation.

It also allows the benefits of generators like nuclear and others to support each other and to reach more broadly than their next-door neighbors.

So there are many benefits. And the current reliability rules and FERC rules do not allow all of those benefits to be recognized and incorporated in grid planning.

Mr. Tonko. Thank you.

And can FERC and RTOs do more to account for these benefits in transmission planning and cost allocation processes?

Ms. Silverstein. Absolutely. Transmission planning is now run according to very limited definitions of benefits and fairly locally negotiated cost allocation rules. And we need a much bigger, national-scale recognition of all of these benefits and the ability to assign costs more broadly, not just according to the, quote, "narrowly defined beneficiaries."

Mr. Tonko. And some of these high-impact projects will need to cross State and RTO boundaries. So, Ms. McIntyre, do you have any recommendations for how we can improve interregional transmission planning to make certain these projects are being properly considered by each region involved?

Ms. McIntyre. Yes. We believe that FERC needs to be granted greater authority for transmission planning and siting. And, again, the CLEAN Future Act does provide a good start in providing some of these authorities, but we think that they need to be strengthened.

Mr. Tonko. Good. Thank you so much.

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

Mr. Rush. The gentleman yields back.

The chair now recognizes the amazing gentleman from West Virginia, my friend, Mr. McKinley, for 5 minutes.

Mr. McKinley. Well, thank you, Mr. Chairman. And please give Paulette a hug from me, okay, as one friend to another.

Listen, Mr. Chairman, the Boston Consulting Group has concluded that, with just a modest increase in the electronic vehicles by 15 percent by 2030, our grid will require a 25-percent increase in generation capacity. Now, that may seem doable, but within the same timeframe this particular legislation calls for the abandonment of all fossil fuel plants, coal and natural gas, by 2035 unless the utilities can miraculously find a solution to this elusive technology of carbon capture. Remember, fossil fuels make up 60 percent of our existing power supply.

So, Mr. Hofmann, my question to you: Do you think it is realistic to undertake a massive build-out of our grid without including fossil fuels?

Mr. Hofmann. I don't see a space in which you don't explore avenues to make existing fossil fuel supplies renewable and clean them up where you can without getting --

Mr. McKinley. We will talk about that in a minute. We are going there in a minute, so don't get ahead of me on this thing. I am going to feed you another question.

But let's go into this transition into perspective. According to our energy consultants, if just a modest 1,000-megawatt fossil power plant were to close -- that is modest -- the utility company would need to have the equivalent of approximately 70,000 electric vehicle batteries for backup power when the wind and solar aren't available.

So let's keep in mind, according to the Journal of Power Sources and the

Manhattan Institute, for 1 electronic vehicle battery, not the 70,000, just for 1 battery, they would need to excavate approximately 250 tons of earth to harvest the minerals necessary for just 1 battery. And that is just for one power plant alone. That would be enough -- just for one power plant alone, that would be enough dirt to fill a convoy of dumptrucks from New York to San Francisco and back again, bumper to bumper. Imagine this conversion if we are going to close down 300 to 400 coal and natural gas power plants.

And my other question would be: How long are countries going to tolerate us ripping up their backyards in our heavy pursuit for lithium, cobalt, nickel, graphite, and copper? Wouldn't it make more sense to continue burning our abundant supply of fossil fuels using carbon capture?

This is precisely the legislation Kurt Schrader and I have been working on for several years. It is a bipartisan, innovation-based approach to use our resources -- existing resources first. So wouldn't that be a more environmentally sound approach, compared to alienating other countries by ravaging their countryside just to satisfy the hungry needs we have in America?

So let me just pose this question to you. If utility companies have to compete with the electronic vehicle manufacturers for the same critical minerals, won't prices increase, as they did for PPE during the early days of the pandemic? So, Mr. Hofmann, where am I wrong on this?

Mr. Hofmann. So I will say -- I can certainly say this, that it is certainly my understanding that there is no invisible force field against the other unintended consequences of when, you know, all these mining approaches and other countries who don't have the stringent regulations that we do in term of modernizing and cleaning our

energy systems, that those impacts will -- the reason why -- I mean, climate change is not restricted to any set boundaries. It is a world challenge.

And that is, from our perspective, why we maintain that advancing technologies in renewable natural gas, hydrogen, pyrolysis, particularly here in California, carbon capture, as you mentioned, utilization and sequestration, these are the pathways on how we can drastically reduce greenhouse-gas emissions without putting people who can't afford energy as a luxury out in the cold.

Mr. McKinley. Well, I thank you. I think that is a good approach, because I think what people are doing, they are ignoring the impact this could have on jobs and what impact it is going to have on people, the economy. I think we can use the infrastructure we have within our power grid, and we just clean it up and use it that way. I think that is a more practical approach than taking this alternative and just throwing out our natural gas and coal-fired power plants. We ought to be able to use that.

So, with that, Mr. Chairman, I yield back the balance of any time I have.

Mr. Rush. The gentleman yields back.

The chair now recognizes Ms. Schrier for 5 minutes. She is recognized for 5 minutes.

Ms. Schrier. Thank you, Mr. Chairman.

As we have discussed, we are living in a time where extreme weather events are no longer extreme or rare, and States will have to transition to this new reality and prepare accordingly for cold snaps, hurricanes, and other extreme events.

Ms. Silverstein, your testimony succinctly says we need to stop pretending that each extreme weather event is low-probability and, instead, start planning and investing as though extreme weather collectively is a high-impact, medium-frequency event. And

part of the solution here is infrastructure, like more robust investments in weatherization programs.

In Washington State, we have an absolutely fantastic program operated under the Department of Commerce. The Weatherization Program, in combination with the Weatherization Plus Health program, preserves existing affordable housing and protects the health and safety of vulnerable populations by making them safer, healthier, more comfortable, more energy-efficient.

And these are all interrelated. For example, Mr. Shaw is a disabled, low-income senior citizen with chronic respiratory illness in Pierce County, my district. And his home had become dilapidated and in desperate need of repair. So, through a unique collaboration between the Weatherization Office and the Tacoma-Pierce County Health Department, Mr. Shaw was able to receive home repairs and weatherization services; also, asthma and chronic obstructive pulmonary disease, COPD, education and care plans. And, ultimately, this led to improved quality of life, better health, energy efficiency, and fewer doctors visits.

And this is a common theme. This joint health-weatherization program has consistently reduced medical expenses, emergency room visits, and missed days from school and work. As a pediatrician, I am always seeking ways that we can address public health issues holistically, particularly when it comes to meeting needs of seniors and low-income individuals and families.

So, to that end, Ms. Silverstein, some of your testimony really caught my eye. On page 11, you state that changes are needed to subtitles C and D to deliver massive energy-efficiency retrofits for low-income and multifamily housing.

So could you just take the remainder of the time here to expand on this point, tell

us what you have in mind, and how we can improve this bill?

Ms. Silverstein. Thank you.

And what I have in mind is that the benefits that your constituent, Mr. Shaw, received shouldn't be limited to him and to your other constituents alone. There are, gosh, probably 15 percent of Americans who are in energy poverty or energy insecurity, and they are responsible for and suffering from an extraordinary amount of damage and harm -- food loss, health loss, stress from bills -- just under ordinary circumstances, and the amount of economic benefit that they could receive and human benefit that they could receive from these kinds of repairs is impressive.

It is shocking that we have not done more. None of the current programs that we have in place -- LIHEAP, Weatherization Assistance, other things -- are able to do the kind of work that the particular program you describe did. And the ability to do that would create just a massive increase in decarbonization as well as in economic growth to all the communities that are affected, and it will start to address equity issues for all of these communities of color and for lower-income citizens.

We have, at the American Council for an Energy-Efficient Economy and organizations like the Texas Energy Poverty Research Institute and others, have made very clear the degree to which energy efficiency can massively reduce energy usage and carbon emissions.

And so we will never be able to achieve the goals of decarbonization at ambitious scale without doing a moonshot level of retrofit work for low-income households and multifamily housing, which are the hardest to change on just regular energy-efficiency programs. So we need to do something special, and we need to do it fast.

Thank you.

Ms. Schrier. Thank you very much. I appreciate your comments.

And I yield back. Thanks.

Mr. Rush. The gentlelady yields back.

The chair now recognizes the gentleman from the greatest State in the Nation, Mr. Kinzinger, for 5 minutes.

[No response.]

Mr. Rush. The chair now recognizes the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. Griffith. Thank you very much, Mr. Chairman. I appreciate it.

In O&I this morning, or early afternoon, Republicans recognized that, in Texas, all fuel systems failed, nuclear being the least. But for a more resilient system, we will continue to need baseload power, we will need storage of power, and, as Ms. Silverstein says, more transmission capabilities.

And I quote from her testimony on page 5: "All credible analyses of a highly reliable, resilient, affordable, clean energy future recognize that we need to massively expand the continent's high-voltage electric grid."

Ms. Silverstein, now, with the regulations of local, State, and Federal governments and the lawsuits that come from that, building of the high-voltage electric grid that you envision that we will need -- and I agree with you -- that will take 20 to 30 years at a minimum, won't it, yes or no?

Ms. Silverstein. Yes.

Mr. Griffith. I appreciate that.

And, with that, Mr. Chairman, I am going to yield the remainder of my time for questions to my good friend, Dr. Burgess of Texas.

Mr. Burgess. I thank the gentleman for yielding.

Mr. Hofmann, let me ask you a question. It sort of came up in your answer to a different question about the pipeline system. We talk about the resiliency of the grid in a number of ways. In Texas, of course, we have abundant natural gas in the Permian Basin, but sometimes we lack the pipeline infrastructure to get it to where it is necessary, where the consuming public is.

So, in the energy workers' world, is there an opinion as to whether or not a more robust pipeline network would facilitate the movement of that product from where it is created to where it is needed?

Mr. Hofmann. Yeah, I don't think there is any question that the more options you give yourself to be able to move energy from point A to point B, the more responsive that system is going to be able to react to, you know, the needs of the local geographic regions that are hardest hit by whatever weather events come their way. Yes.

Mr. Burgess. Well, and it is not even just the extreme weather events. It is a normal product of commerce from producing the natural gas in the Permian Basin, like, needing to get it to centers of consumption or even centers from where it would be exported.

We do seem to forget that literally just a year ago the United States was a net exporter of energy. I hope to get back to that position in the near future, but we won't do it without things like a robust pipeline network. Is that not correct?

Mr. Hofmann. Absolutely. And, you know -- yeah, you are absolutely right. And any system that needs to deliver -- the other advantage of having more of it is that, when systems become compromised in any way, the more opportunities you have to move that energy to other places and isolate that specific problem, the less impacts there

will be to the consumers on the burner end.

Mr. Burgess. Very good.

And your union is primarily people who work in the oil and gas industry. Is that correct?

Mr. Hofmann. Our local union is specific only to workers at SoCalGas.

Mr. Burgess. Right. And the workers in, say, the nuclear energy field, they have their own professional association?

Mr. Hofmann. That is correct.

Mr. Burgess. And they are not really interchangeable, are they?

Mr. Hofmann. I have no idea. I wouldn't know anything about nuclear.

Mr. Burgess. Right. The skill set is entirely different, from what you do and a nuclear worker does.

Mr. Hofmann. There is no question. There is no question.

Mr. Burgess. And the hazards inherent in your --

Mr. Rush. The gentleman's time has expired. The gentleman's time has expired.

The chair now recognizes --

Mr. Griffith. He still had 50 seconds, Mr. Chairman. He still had 50 seconds.

Mr. Burgess. So, Mr. Hofmann, the workers in oil and gas, the skill set is different from workers in nuclear energy because the hazards are different.

But I only bring that up to illustrate that the interchangeability with someone in the solar and wind industry is likewise going to be problematic. For people in your profession to go to the solar and wind sector is going to be problematic, is it not?

Mr. Hofmann. It would be indeed.

Mr. Burgess. And, again, same reasons are going to be safety considerations. There are aspects of your training that are unique to your field. And we thank you very much for what you do and what you provide to the country, and we hope to not damage you too much in the interim with this legislation.

Thank you, Mr. Chairman. I yield back.

Mr. Griffith. I yield back.

Mr. Rush. The gentleman yields back.

The chair now recognizes the gentleman from North Carolina, Mr. George Kenneth Butterfield, for 5 minutes.

Mr. Butterfield. Shhh. Don't tell everything you know, Mr. Chairman. Thank you so much very, Mr. Chairman, for your friendship. And thank you for being patient with me today; I am testing out a new headset this afternoon, and so we will see how this goes.

Mr. Chairman, this is a very, very important hearing. I want to thank you for your leadership, not only on this committee but in the energy space. It has been phenomenal.

And to the witnesses, your testimony today has been very, very valuable, and I appreciate you as well.

Let me begin with Dr. Wayland.

Dr. Wayland, the CLEAN Future Act creates a $250-million-per-year loan and grant program for solar installation in low-income and underserved communities, which will lead to increased construction of solar-generating facilities to serve multifamily affordable housing. These funds will also create many, many good jobs in low-income communities.

Could you please elaborate on how these types of Federal investments into low-income communities can enhance our overall effort to strengthen grid resiliency and modernization?

Dr. Wayland. Yeah, I think that is a great question, Congressman, and there are two set of benefits. One is the benefits to the low-income communities that get the benefit of clean, affordable electricity just like everybody who can afford to put rooftop solar on their houses do. And the second benefit is that those facilities should make those communities more resilient in the face of energy disruptions, as long as they are well-designed in order to be able to provide power when the grid itself cannot.

So I commend you for including not just the program for low-income solar, but, across the bill, there are provisions to address the needs for low-income communities in weatherization, energy efficiency, and micro grids and other provisions. They are critical to --

Mr. Butterfield. Thank you.

Now let me go, please, to Ms. Silverstein. I think Mr. Griffith referred to you as Ms. "Silverstine." I am not sure which it is. But, in any event, you stated in your testimony that we need to go beyond the traditional block grants such as LIHEAP and weatherization assistance programs and recommend a more enterprising approach to energy-efficiency measures that include delivering energy-efficiency retrofits for low-income and multifamily affordable housing.

Here is the question. Could you elaborate on how adoption of your more comprehensive energy-efficiency approach can benefit low-income communities and communities of color?

Ms. Silverstein. Yes, sir. Those are the very communities who need this most,

because traditional energy-efficiency programs only do energy efficiency; they don't do home repair. They are relatively narrow in their funding, and they don't serve enough people quickly enough.

And that is where the need is the greatest, in terms of citizens who need help with better energy and better budget control. And so having greater energy efficiency and improved housing quality will do a great deal for their health, for their wallets, for economic development, and for community quality overall.

Mr. Butterfield. Thank you.

And let me conclude with Ms. McIntyre.

Ms. McIntyre, the 2009 American Recovery and Reinvestment Act, or ARRA, as some of us call it, created a cost-share program to finance investments in advanced metering infrastructure. Electric co-ops -- and I have several in my State -- such as those in my district, use this cost-share program to establish smart meters, which improve efficiencies. They decrease costs for consumers and benefit the environment.

Section 230 of the CLEAN Future Act directs the Secretary to establish a program that will provide funding to partners such as electric co-ops to modernize the grid. Can you discuss the benefits of providing funding for partnerships aimed at improving the grid?

Ms. McIntyre. I am going to have to admit that I am not that familiar with that section and what it does, so --

Mr. Butterfield. All right.

Ms. McIntyre. -- I will get back to with you an answer on that. But, again, any partnership that helps, you know, fund these important programs is a good thing.

Mr. Butterfield. Absolutely.

Ms. McIntyre, would you -- not McIntyre. Would Ms. -- is it "Silverstein" or "Silverstine"?

Ms. Silverstein. "Silverstine," please. Thank you.

Mr. Butterfield. Okay. Well, Mr. Griffith is right then. Can you take a chance on this question? Are you able to help us with it?

Ms. Silverstein. Yes. Thank you.

The benefit of public-private partnerships is that, usually, utilities and their regulators are not willing to spend as much money as many of these projects take. And so the benefit of Federal matching funds is that it brings additional attention and opportunity and important investment matching to projects that wouldn't be undertaken if the utility had to pay for it all on its own.

Thank you.

Mr. Butterfield. Thank you.

Thank you, Mr. Chairman. I yield back.

RPTR ZAMORA

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[4:04 p.m.]

Mr. Butterfield. Thank you.

Thank you, Mr. Chairman. I yield back.

Mr. Rush. The gentleman yields back.

The chair now recognizes the gentleman from Ohio, Mr. Johnson, for 5 minutes.

Mr. Johnson. Well, thank you, Mr. Chairman.

You know, in listening to the testimony, one of our witnesses, Mr. Hofmann of the Utility Workers Union, he mentioned one of the values his workers hold in especially high regard, and that is the importance of not cutting corners. This is crucial in the day-to-day work of safely maintaining the infrastructure that delivers natural gas to millions of customers every day. As policymakers, we must also take great care when considering legislation that would dramatically impact industries that so many American livelihoods depend on.

I keep hearing from my colleagues on the other side again and again, they make their proposed climate solutions sound so simple: Transmit solar and wind energy electricity across the continent when needed; electrify everything and hope for the best; and my personal favorite, the fossil fuel workers can just go build solar panels. But this isn't how the real world works.

Going from A to B like this with nothing but government mandates and bags of taxpayer cash is going to result in a lot of cut corners along the way, a lot of jobs lost, and a lot of hardworking men and women with diminished livelihoods.

Has anyone wondered what would happen if this doesn't go as planned, the

unintended consequences? I fear with this rush to green, our committee, this committee is ignoring serious warning signs about future grid reliability, energy affordability, and national security.

Mr. Hofmann, we have seen localities across the country taking action to ban new gas lines into homes in the name of fighting climate change to fully electrify home functions like cooking and heating. In your expertise, can you speak to the immediate risks and the cost of such mandates?

Mr. Hofmann. Well, the immediate risks are really pure and simple, that they are directly impacted workers. So when all new building construction is mandated, it can only be geared for electric.

What happens to the other side of that system that is not new? As utilities face the added cost of maintaining and updating their system without those additional new revenue streams to sort of spread across everybody, you know, more equally, it is going to put an extra burden on people who can't afford to pay for things to go all electric. And regardless of what system you use or how clean it is, the system has to be safe first and foremost.

Mr. Johnson. Okay. Well, continuing with you, Mr. Hofmann, in my district in eastern and southeastern Ohio, the oil and gas industry has been a lifeline providing good jobs, many of them union jobs in an Appalachian region that has long prided itself on keeping America's lights on.

Can you speak briefly to the dignity of work, the efforts of proud Americans doing their jobs like their parents and grandparents did in places like Appalachia Ohio, or your community in southern California? How do you believe your union membership would receive the news that they are out of work because politicians demanded it instead of

letting the free market control it?

Mr. Hofmann. Well, I can tell you that they have already responded, you know. In November of 2019, you know, prior to the pandemic, we had over -- we had close to 2,000 of our members show up on a Saturday to voice their concerns about this push for mandated electrification. So we are a prideful craft and trade. As I mentioned, I am a second-generation utility worker, and I am proud of it. It is a craft that we have been perfecting for a very long time, and we just -- we are not the problem. We feel as utility workers here in southern California, we are part of the solution to solving this climate change crisis.

Mr. Johnson. Okay. Well, thank you very much.

Mr. Chairman, I yield back an entire 25 seconds.

Mr. Rush. The chair certainly thanks the gentleman for yielding back.

The chair now recognizes the gentlelady from California, Ms. Matsui, for 5 minutes.

Ms. Matsui. Thank you very much, Mr. Chairman, and thank you very much for the hearing today. And I want to thank all the witnesses for being here too.

Last year's devastating wildfire season and this year's deadly Texas winter storm are testaments to the catastrophic impacts of intensified natural disasters due to the climate crisis. These events expose the deep vulnerability of our energy infrastructure and underscore the need to prioritize grid resiliency and improve energy efficiency to combat climate change and protect our communities, especially low wealth and communities of color who are on the front lines on the climate crisis.

Energy efficiency investments not only create jobs and save money for consumers, it can also cut national energy use and greenhouse gas emissions by about 50 percent by

2050. Earlier this year, I wrote a letter to the administration encouraging the establishment of a national program to include indoor air quality and HVAC energy efficiency in our Nation's schools.

Dr. Wayland and Ms. McIntyre, how would a dedicated program to revamp HVAC systems and similar grants for school energy efficiency improvements, like the ones included in the CLEAN Future Act, help grid resilience and reliability? Dr. Wayland?

Dr. Wayland. I will start. Well, there are a couple ways that upgraded HVAC systems could help. First is improving the heat efficiency of the building and reducing energy costs. As you mentioned, there are significant indoor air quality benefits for upgraded HVAC systems. In fact, in areas where air quality has improved because of either filtration or HVAC systems, students actually learn better, significantly better. So it has so many benefits beyond just energy efficiency.

For the grid, if those HVAC systems -- and in larger buildings like schools, those HVAC systems, actually when aggregated, can become quite a resource that grid operators can use to help provide grid services. So to the extent that we can make sure that when upgrades happen that those investments also encourage the integration with the grid, we get additional benefits for grid resilience.

Ms. Matsui. That is great.

Ms. McIntyre?

Ms. McIntyre. [Inaudible] and I agree with everything Karen said. Certainly, upgraded HVAC systems would help reduce demand on the grid, but also, when you do the upgrades, if you include benefits of demand flexibility. So, you know, when in times of crisis, if that HVAC system has the ability to be controlled externally to, again, reduce the demand during that crisis, then it improves the resiliency of the grid.

Ms. Matsui. Okay. And both of you again, what additional energy efficiency initiatives should Congress prioritize to help reduce the burdens and negative impacts from disasters and harmful pollution on disadvantaged communities?

Dr. Wayland. Well, I think that Ms. Silverstein and Ms. McIntyre both touched on this, that the communities with the greatest energy burden have the least ability to invest in improving their building stock, and so it is incumbent on the Federal Government to help with that. And so I think that to the extent that we can move resources into that energy efficiency bucket, it will be very critical for protecting those low-income communities as well as a very significant contributor to reducing greenhouse gas emissions overall.

Ms. Matsui. Okay. Ms. McIntyre, any comments?

Ms. McIntyre. And agree. And I mentioned it before, the Weatherization Assistance Program needs to be expanded and the funding needs to be increased for that. So, again, going in and helping people insulate their homes, weatherize their homes will, again, decrease energy demand. And so that is a very important component of energy efficiency that needs to be strengthened.

Ms. Matsui. Okay. How can electric utility companies, environmental stakeholders, and local, State, and Federal Governments work together to bring forth solutions that work for our communities? Either one of you? Ms. Wayland, Ms. McIntyre?

Dr. Wayland. Well, I think that addressing climate change and building resilience is not the sole function of any one component of our economy. So, for example, utilities have the responsibility to make investments that protect reliability and affordability. But as I mentioned, the States and local governments also have a responsibility for energy

assurance planning, and the CLEAN Future Act does include a provision that would require States to submit to the Secretary of Energy an annual updated energy security plan, which I think is a good way to really address that, and that goes to those plans are developed in conjunction with a whole broad range of stakeholders.

Ms. Matsui. Thank you very much. And I have run out of time, so I yield back. Thank you.

Mr. Rush. The gentlelady yields back.

The chair now recognizes the gentleman from Indiana, Mr. Bucshon, for 5 minutes.

Mr. Bucshon?

All right. I don't see Mr. Bucshon.

The chair will move on and recognizes the gentleman from Michigan, Mr. Walberg, for 5 minutes.

Mr. Walberg? Mr. Walberg is not answering.

The chair now recognizes Mr. Duncan for 5 minutes.

The chair now recognizes the Representative from --

Mr. Walberg. Mr. Chairman? Walberg here. It is turned on now. Can you hear me?

Mr. Rush. Yes. Okay. Mr. Walberg, you are recognized for 5 minutes.

Mr. Walberg. I apologize for that technological problem, but -- I am not only from Michigan, but I grew up in your district, so it is good to be recognized by you.

I want to thank the panel for being here today. I want to give a special shout-out to Ms. McIntyre, who I understand is from -- originally from southeast Michigan and started her career with Detroit Edison, now DTE, so welcome especially to her. I would

also like to especially welcome Mr. Hofmann of the UWUA Local 132.

Not many of us in Congress understand what it is like to work with our hands every day, but I grew up in a union household. My father was a machinist and union organizer for part of his career. And upon graduating from high school, I went to work at the U.S. Steel South Works, the same place that my dad worked for a time. The lessons I learned from my father and my own experience helped shape my understanding of what really is a dignified, family sustaining job that can be produced here in America and produces things for America and the devastating impact of those jobs being taken away.

Mr. Hofmann, I understand your union heritage, second generation, proud of what you do, and I appreciate that. It is not all that common that we get a witness outside of the Beltway that can talk about real-world impacts of policies we are considering here today.

Mr. Hofmann, it should be clear to everyone that the goal of my Democrat colleague friends with this so-called CLEAN Future Act is really ultimately to eliminate jobs for utility workers like those you represent. They even have a section in their bill called "worker and community transition" to pay off what they are calling dislocated workers who lose their job due to the closure of a major employer. In fact -- and you can all look at it -- on page 949 in the bill, the bill lists a whole range of jobs that it will terminate.

How does it make you feel, Mr. Hofmann, to hear politicians demonize an entire workforce supporting clean and in some cases even renewable natural gas?

Mr. Hofmann. I thank you for the question. I think it is sort of -- to be honest, it is a little -- it is kind of irresponsible in a way to sort of -- we have got to move past this overly simplified set of assumptions and presumed outcomes of what our energy mix is

going to be, you know, a decade from now, two decades from now, three.

We need -- you know, this is not a Democratic or a Republican problem. This is an issue that -- a phase that impacts every American, and we have got to really find ways to work together to make sure that no worker gets left behind and that we -- that energy does not become a luxury for just only the affluent. And we have got some real work to do, and we are happy to partner with all of you in any way we can.

Mr. Walberg. We appreciate your work. I have the privilege also of serving on the Education and Labor Committee in Congress here, and I am constantly hearing from employers about the struggle to find well-trained workers to meet the growing demand in skill trades. I call them professional trades or technical fields.

Mr. Hofmann, can you tell me about your members, the different types of jobs available in your industry, and the skills you learned and now use to help train the next generation for a career like yours?

Mr. Hofmann. Sure. So, like I said, you know, we cover here wall to wall, all sorts of different aspects, from our experienced welders on the pipelines for our mains and services to our appliance technicians who go into people's homes and help get their gas appliances burning more efficiently and clean and effective. We have fleet mechanics that work, you know, on our fleet, you know, our vehicles. We have got facility mechanics that keep our buildings and everything up to speed. You know, we have our admin clerks. We have our call center reps.

I mean, we cover a very broad range of literally every walk of life you can imagine. And these workers, they are incredibly skilled and they are a resilient bunch, and it is pretty impressive to watch.

Mr. Walberg. It certainly is. And I guess in my remaining time, I would just like

to respond, when we hear that it is Republicans standing in the way of these renewable jobs and renewable sources of energy, it is not the Republicans that are doing the demonstrations; it is the left are to stop mining, manufacturing of those resources that produce the alternatives. But we need what you produce, Mr. Hofmann, and thank you for the work you do. I hope we can see you do it for a long time.

I yield back.

Mr. Rush. The gentleman yields back.

The chair now recognizes the gentlelady from Florida, Ms. Castor, for 5 minutes.

Ms. Castor. Well, Thank you, Chairman Rush, for holding this very important hearing today on the CLEAN Futures Act. It comes at a critical time when we must act with urgency to tackle the increasing costs and risks of the climate crisis and do it in a way that creates jobs and economic opportunity especially in our underserved communities.

You know, after 2 years of work on the Select Committee on the Climate Crisis, listening to experts and labor unions and scientists and some of the folks who are here today, I have learned that there are many ways to increase the resilience of our energy systems and to reduce greenhouse gas emissions at the same time. And the Select Committee made a number of recommendations to the Energy and Commerce Committee, and I want to thank you for incorporating many of them into the CLEAN Futures Act.

Let's go over a couple of them. Provide incentives to help States and local communities to site interstate transmission lines, to clear out interconnection queues to bring more renewable energy and storage onto the electric grid. We suggest that we direct FERC to work with, not against, States' efforts on clean energy and energy efficiency to help lower the cost for businesses and families alike, and invest in

community solar to ensure equitable access to clean distributed energy, and ensure environmental justice communities have equitable access to the benefits of clean energy, workforce development, jobs, and then, of course, work on the resilience of the electric grid that has become such a hot topic after the catastrophe in Texas.

So we have had a good discussion here today, but I wanted to ask our witnesses to comment on some of those recommendations, especially the grid-enhancing technologies. Some of the folks on the other side of the aisle think this is pie in the sky, and what I have learned is these are technologies that are available today, American-led innovative technologies that can help build the macrogrid we need in America.

Dr. Wayland, let's dive a little bit deeper. You have suggested some grid investments for economic recovery. Where would you target our innovative investments to create jobs and at the same time build that resilient macrogrid for the U.S.?

Dr. Wayland. Well, I am glad that you mentioned that we have the technologies today, because I think that is what the 21st century grid provisions in the CLEAN Future Act do that is different from what was in the Energy Policy Act of 2020. And we do believe that the grid provisions in the bill that you passed in December were very important and critical. But in my reading of the difference between the two, the Energy Policy Act really focused on the research development and development and demonstration of grid technologies. And it appears to me that the 21st Century Act focuses in on deployment.

And I think that is really critical because we have a range of technology deployment across the country. We have some utilities that have, over the course of the last 10 years, have invested hundreds of millions of dollars in grid modernization, and

we have some utilities that don't even have the most basic advanced meters and SCADA systems.

And so we would recommend a suite of investments to build out the flexibility and the resilience across the country and recognize that different business models, so whether it is an investor in utility, a municipal utility, or a rural co-op, all have different business models. And so in order to deliver incentives that would help them accelerate their grid modernization programs, we probably have to look at different ways to deliver that aid.

Ms. Castor. And we learned from a number of studies that have come out over the last year, this is enormous opportunity to create jobs. Are you kidding me? Utility workers are going to be at the top of the list. The number of new jobs here, we are going to struggle, I think, to train and employ everyone if we move forward with the macrogrid and community solar.

So, Dr. McIntyre, talk to us for a little bit about equitable access to reliable clean energy.

And then I want to ask, Ms. Silverstein, what do we do with States that are roadblocks to clean energy deployment? I may not have time to get to that one, but so I will ask you to come back with that.

Ms. McIntyre.

Ms. McIntyre. Thank you, Congresswoman. As we have mentioned, you know, typically the low-income communities and communities of color have had the most impact from the climate disasters, pollution, and, you know, high-energy cost due to a lot of issues with, again, their homes being uninsulated and whatnot.

So I think a lot of the provisions in the CLEAN Future Act do go pretty far in trying

to provide greater access to those communities and provide benefits and assistance to ensuring that they receive the benefits of a more resilient and reliable grid.

Ms. Castor. Thanks so much.

Thank you, Mr. Chairman.

Mr. Rush. The gentlelady yields back.

The chair wants to inquire as to whether Mr. Kinzinger or Mr. Buschon is on the line or on the Zoom.

Hearing otherwise, the chair now recognizes the gentleman from South Carolina, Mr. Duncan, for 5 minutes.

Mr. Duncan?

The chair recognizes Mrs. Lesko from Arizona, the Representative from Arizona, for 5 minutes.

Mrs. Lesko. Thank you, Mr. Chairman. Debbie Lesko here. Can you hear me?

Mr. Rush. Yes, Mrs. Lesko.

Mrs. Lesko. Can you hear me? Hello?

Mr. Rush. You are recognized.

Mrs. Lesko. Okay. Fantastic. Thank you, Mr. Chairman.

My first question is for Mr. Hofmann. Mr. Hofmann, do you think that greater use of carbon-capture technology, creating jobs that potentially could be built on the skills that many of your workers use, like if we use carbon-capture technology?

Mr. Hofmann. Yeah, absolutely. You know, CO2 pipelines is a pipeline, and it is molecules. It is what we do. And to be honest, in order for us to meet our goals, my opinion is that we are going to need to in order to get there.

Mrs. Lesko. Thank you, Mr. Hofmann. Mr. Hofmann, I have another question

for you, if you know the answer. Do you think there is an opportunity for hydrogen production and its potential for safety reliability and affordability to help us to fully optimize our existing energy infrastructure? What do you think of using hydrogen?

Mr. Hofmann. I absolutely believe that it is something that we need to do. We need to do it sooner than later.

Mrs. Lesko. Thank you.

And my next question is the same question for Ms. Silverstein. What do you think about investing or using more hydrogen technology? My understanding is that some of the natural gas facilities could be utilized then.

Ms. Silverstein. I cannot give you an informed answer on that, ma'am.

Mrs. Lesko. Okay. And, Ms. Silverstein, I have another question for you. Earlier this week, in a different Energy and Commerce Committee hearing, former Energy Secretary Moniz said, if I am not mistaken, that to install one offshore wind turbine would take 1 ton of critical minerals to make it, to produce it.

And so I am concerned on our reliance on China for processing a lot of our critical minerals, not only for wind -- production of wind turbines, but for the lithium needed in battery storage, whether that is battery storage for electricity or whether that is electric vehicle batteries. Would you support more domestic mining and processing of critical minerals here in the United States?

Ms. Silverstein. I have not studied that issue deeply. I cannot give you a good answer. Thank you.

Mrs. Lesko. Can any of the witnesses answer that for me?

Dr. Wayland. Well, I am actually a geologist by training, so -- and I am sitting here in Nevada where we actually are -- there are a number of lithium mines. There is

currently a lithium mine in Silver Peak, Nevada. It is a lake bed brine facility, and there are a number of investors that are looking around the State and also in California at building out lithium mines.

So I think we will see an increase in domestic production, not just of lithium but some of the other critical minerals. And if I am not mistaken, there is a provision in the CLEAN Future Act that requires an evaluation of critical minerals. I know the Defense Department has done that several times over the last few years, because many of those critical minerals are important for defense equipment as well. So I think there is a lot of attention being paid to, not only where the sources of critical minerals are, but recycling and alternatives as well.

Mrs. Lesko. Yeah. Thank you, Ms. Wayland. I appreciate that. I too, as you guys know, previously -- I think this is a really critical factor, because what I read is that most of the processing of lithium takes place in China where they use coal-fired plants to process the lithium.

So it doesn't make sense to me, if we are going to promote -- and we should, to an extent -- electric vehicles, we need to look down the road. Like, how are they going to be made? Are we going to have enough lithium? And if we have other renewables, are we going have enough critical minerals? And so we need to be less reliant on China and possibly other foreign hostile countries.

Mr. Hofmann, I have 27 seconds left. Do you have anything you would like to add?

Mr. Hofmann. Just that we are going to need everything at our disposal, whether it is hydrogen, wind, lithium, ion, solar. We are going to need everything.

Mrs. Lesko. Thank you, sir.

And I yield back, Mr. Chair.

Mr. Rush. I want to thank the gentlelady. Please accept my sincere apologies, Mrs. Lesko.

All right. The chair now recognizes the gentleman from Vermont, Mr. Welch, for 5 minutes.

Mr. Welch. Thank you very much, Mr. Chairman, and thank you for the hearing. And I want to thank the witnesses for a wonderful hearing.

I have been working on this committee with many of my colleagues, both sides of the aisle, on energy efficiency measures. It is the cheapest form of power, saves money, reduces carbon emissions, creates local jobs.

Ms. Silverstein, I wanted to ask you, as we continue to electrify our power sector, how could a national energy efficiency resource standard that sets utility level electricity and natural gas efficiency requirements help us meet national environmental goals and improve the resiliency of the national grid?

Ms. Silverstein. That is a great question. Thank you, sir.

With respect to improving the decarbonization, everything that we do for efficiency will -- is one of the cheapest ways to reduce carbon emissions from across the board. The level of waste in fossil fuel burning, not all of the energy that goes into production of electricity comes out as -- a lot of it goes up as carbon and as waste and doesn't get into our homes and businesses to provide meaningful services. So the more that we can save electricity, the more that we can save carbon, and it is often the cheapest way to do so.

With respect to grid reliability of resilience, energy efficiency, by reducing the amount of load that we have to meet, it means that there is less burden on the grid

operationally --

Mr. Welch. That is great.

Ms. Silverstein. -- and there is less burden for all of the services and the peak loads and operationally, hour to hour, minute to minute.

Mr. Welch. Great.

Ms. Silverstein. So it is incredibly efficient.

Mr. Welch. Thank you so much.

Ms. McIntyre, Representative McKinley and I have been working to improve model building codes. And I want to ask you this: How do model building codes help State and local governments achieve energy and climate goals? And, importantly, how can model building codes improve resilience in safety in the face of weather and climate disasters?

And I want you to answer that in the context of a lot of folks don't want codes. They fear that they will increase cost. Mr. McKinley and I think if you have codes and it sets a reasonable standard, everyone has to compete to that standard to get the benefit of the energy savings that would occur.

Thank you.

Ms. McIntyre. Thank you, Congressman. And I commend the work that you and Congressman McKinley have done on this issue. Again, building energy codes are one of the key policy tools that State and local governments have at their disposal to address energy use and climate impacts of new buildings.

Buildings are responsible for about 40 percent of all carbon emissions in this country, and it is cheapest and easiest to reduce building emissions at the time of construction. So constructing new buildings to be efficient and decarbonized from the

start means lower energy bills for homeowners and businesses who use those buildings, and prevent the need for expensive retrofits in the future.

So it can lower the cost, obviously, of energy use, and if you do it from the get-go, you know, you are saving the money from having to do retrofits in the future. So they are very critical to have these codes and implemented. And, again, the CLEAN Future Act does recognize the importance, and we encourage there to be strengthened provisions in there on building codes.

Mr. Welch. What do you say to some of the builders -- they are always concerned about cost, and I respect that -- who say that if you have any codes, that is going to lead to higher cost?

Ms. McIntyre. If you have the codes, again, from the beginning and, as you said, you know, you have competition among the developers to, you know, drive the most efficient buildings, you know, again, once you --

Mr. Welch. Right.

Ms. McIntyre. -- build those buildings, you decrease the energy cost and the cost of --

Mr. Welch. Thank you very much.

Mr. Chairman, I yield back.

Mr. Rush. The gentleman does yield back.

The chair now recognizes the gentleman from Indiana, Mr. Pence, for 5 minutes.

Mr. Pence. Thank you, Chairman Rush and Ranking Member Upton, for holding this hearing.

Like my colleagues on this committee, I support a diverse all-of-the-above strategy for energy production. But like my peers on the Republican side, I am concerned that

the one-size-fits-all mandates in the CLEAN Future Act far outpaces the current state of technology, leaving consumers to foot the bill for higher costs on everything from electricity prices in heating their homes to the appliances they will need to buy from the department store.

All the while, power generation will not have the security of baseload supply from national -- natural gas or coal, resulting in a less reliable grid, as we have recently seen. The provisions for clean energy standards, microgrids, and distributed energy systems, while good in academic theory, all rely on the adoption of technology that is still bridging the gap between basic research and commercialization.

In a mere 2-1/2 years, starting in 2023, zero-emission electricity requirements will begin straining the budgets of our power sector. Even if they started this very afternoon, public power agencies, electric car co-ops, and utilities in my district will be hard pressed to incorporate even more renewable energy generation or carbon mitigation equipment into their already robust portfolios. These entities will have no other choice than to raise prices on their ratepayers, my constituents.

This bill disregards critical things like permitting reforms that will be necessary to meet its own timeline for infrastructure construction. Carbon-capture equipment alone may take 5 years to be fully operational. To find out who will pay for these programs, look no further than to the provisions on electric vehicle infrastructure buildout.

To support the extensive electric vehicle network this bill envisions, the language acknowledges expected price increases and gives a green light to pass these costs on to utility customers as a whole.

Since electric vehicles will be best suited for urban centers and densely populated areas, rural customers like those in my southeast Indiana will still have to foot the bill.

Companies that will likely take advantage of these electric vehicle charging stations will look to the highest rate of return on their investment, meaning they will look toward cities and not the rural and hard-to-reach parts of our country.

Even without these extensive subsidy programs that will have packed in -- that will have been packed into this bill, auto manufacturers operating in the free market are already moving in this direction. Companies throughout Indiana's Sixth District are leading the way to produce innovative batteries, hybrid engines, and alternative transportation fuel vehicles.

But until this technology can sustain the mileage requirements for those beyond densely populated areas, and recently I have heard complaints about suburbs and the ability to run around, this bill will benefit urban centers at the expense of rural America.

Lastly, I am concerned about the implications this bill will have on pensions that are tied to the companies this bill seeks to put out of business. What happens to hardworking Hoosiers nearing the retirement age, as we have talked about? What will happen to local taxpayers that are investing their savings in anchor institutions in the community that will go under when this bill is signed into law? I don't think my Democratic colleagues are prepared for the extensive implications this will have on our communities.

Mr. Hofmann, this bill would implement an untested transition program for energy workers. The provisions in this bill would even target the manufactured sector for light- and heavy-duty vehicles adversely affecting our workers' earnings as well. As the crossroads of America, these programs will directly impact hardworking Hoosiers who have stable, good-paying jobs producing the necessary transportation equipment that our country currently relies on to move goods along our highways.

I got into Congress because I have watched for decades the long destruction of the middle class in Indiana as great-paying manufacturing jobs have been shipped overseas leaving Hoosiers with few options to provide for their families.

My question to you, sir, will the transformative measures of these bills continue a similar assault on the middle class in my and communities across this country, in your opinion?

Mr. Hofmann. I would caution those who think that these systems are simple. These systems are very complex, and they require a lot of attention and detail. And there needs to be a great consideration and reverence to the workers who make these systems go and who overall maintain these systems, and that is the best way I could answer that.

Mr. Rush. The gentleman's time is expired.

The chair now recognizes the gentleman from Oregon, Mr. Schrader, for 5 minutes.

Mr. Schrader. Thank you very much, Mr. Chairman. I really appreciate this hearing. Looking forward to continuing our work to address climate crisis and, in particular, to achieve deep decarbonization of our power sector by enhancing grid resilience, supporting our energy and utility industries and the workers around the country that keep our lights on.

And shout-out to Mr. Hofmann. Folks like you kept the lights on in Oregon. While Texas had its deep freeze, we had a big deep freeze in my district, in the Willamette Valley. And the overtime work, the extra mile that the utility workers did to get us back online, I just really appreciate that and want to thank you and all your folks for that.

And for my colleagues that are worried about the world ending with the CLEAN

Futures Act, I have got the answer for it. Congressman McKinley alluded to it earlier. We actually have a bill that would fit nicely into subtitle E, the clean electricity generation portion of the CLEAN Futures Act. It is agnostic as to the source of power, but it does drive deep opportunities for us to reduce energy usage and, frankly, decarbonize.

Our legislation -- we introduced it last year, we are reintroducing it this Congress -- would commit significant resources to energy innovation, not just on the renewable side, but also on the fossil fuel side, to get to the decarbonization that many of you have alluded to here today. That is real. It will happen. And I think the best way to make it happen is by partnering, as Dr. Wayland referred to, with private industry, matching dollars, matching opportunities, and not just in, you know, research but in applying the technology going forward.

We could have -- and coupled with that innovation is an actual clean energy, clean electricity standard that would drive that decarbonization with timelines, put in statutes so that the utilities, so that environmental groups, so that Americans can make investments based on a defined statute that would stand the test of time no matter what administration walks into the White House every 4 years.

I guess I would just urge my colleagues to really look closely at this. We have talked to the chairman of the full committee. We are going to be talking with committee staff later this week, trying to, you know, frankly, explain what our options are here. This could be a great opportunity to bring our committee together, bring America together, not lose jobs, but to the testimony we have also heard today, actually increase jobs going forward.

It is inclusive as to the energy sources. It is not some carbon tax proposal that would raise prices. It is a more innovative and the only bipartisan solution that is out

there at this point in time. So I would really urge all my colleagues, Republican and Democrat, take a close look at this.

I would encourage the Natural Resources Defense Council, Ms. McIntyre, I would like to get your feedback on this, and GridWise's feedback also, Ms. Wayland -- or Dr. Wayland. That would be very, very helpful for us.

We see this as a path forward, along with the efficiencies that we see in this bill and some of the innovations. And, again, it would be nice to have a great bipartisan approach to driving our power sector emissions to down almost 95 percent by 2050. And we are open to the timelines going forward.

And with that, I yield back, Mr. Chairman. Thank you so much.

Mr. Rush. I thank the gentleman for yielding back.

The chair now recognizes the gentleman from North Dakota, Mr. Armstrong, for 5 minutes.

Mr. Armstrong. Well, I would start with saying, Congressman Schrader, I hope you keep it as a stand-alone bill because I want to be able to support it, and if it goes into subsection E here, I might have a little trouble.

But this is just kind of a yes or no question because we are talking about interoperability and reliability and resiliency of the grid, and I am all in on boning up that infrastructure. I did the FAST Act permitting, looking for help with that on any other side of the aisle. Hopefully, we can get some bipartisan solutions moving forward so companies who divest their capital can see a return and not deal with some of those issues. But the grid is only reliable as the energy that is being put on to the grid.

So just really quickly, yes or no, Ms. McIntyre, under current technology, should we consider wind and solar baseload power?

Ms. McIntyre. No.

Mr. Armstrong. Okay. Ms. Silverstein?

Ms. Silverstein. No. But let's be clear that coal and nuclear are not baseload power all the time either.

Mr. Armstrong. Well, all the time -- well, they are dispatchable, though, correct?

Ms. Silverstein. Yes, but dispatchable and baseload are not the same thing.

Mr. Armstrong. I understand that, because in some places we are dealing with that, but -- and just since we are there now, right, I mean, the one problem with wind and solar is they can't ramp up, they can only ramp down.

Ms. Silverstein. That is true, but increasingly there is hybrid storage attached to those that makes them dispatchable and rampable.

Mr. Armstrong. Well, hybrid storage, as it exists now and as the technology will advance in the future, are very different things. I agree technology is going to advance. I don't agree that we should regulate and legislate on technology that doesn't exist yet.

Mr. Armstrong. It does exist. It is on grids today, sir.

Mr. Armstrong. Okay. Not at the scale we are going to need to replace solar, wind -- or natural gas, wind, and nuclear.

But do we produce any lithium -- Mr. Hofmann, do we produce any lithium in the United States?

Mr. Hofmann. I am not aware of that.

Mr. Armstrong. Do we produce any cobalt in the United States?

Mr. Hofmann. Again, not my area of expertise.

Mr. Armstrong. Do any of the witnesses know if we produce any lithium or cobalt in the United States?

Okay.

Dr. Wayland. I do believe -- I do --

Mr. Armstrong. Oh, go ahead.

Dr. Wayland. Yeah. I do believe we produce lithium, and I do believe that there are a number of lithium mines in the process of being developed.

Mr. Armstrong. We don't produce any lithium. We had a mine in Nevada. There may be some in development.

Does anybody know if we place any environmental conditions on the countries we import lithium from?

Does anybody know if we place any environmental or human rights conditions on the Democratic Republic of the Congo where we get our cobalt from?

Sometimes it is hard to do this when you have to wait hours to do this, but early on, the chairman of the full committee said we don't produce these things here. And I just want to say that Republicans in the private sector are not the ones preventing the manufacture of more solar panels. We actually produce solar panels in North Dakota -- or not solar panels, wind turbines. But we are not the ones stopping more solar panels, wind turbines, and batteries in the U.S.

Environmental groups, their lawyers, cheap foreign labor, better environmental and regulatory conditions are the reasons that we don't have the mining, extraction, or processing, or manufacturing capacity that is necessary to onshore even a small portion of these supply chains, which is why, with the last minute, I would like to go back to Mr. Hofmann.

And when they talk about repurposing your members, and not just yours, but union workers all across the country -- I mean, all the pipe laid in North Dakota is laid by

union workers, come from all over the country. We love to have them there. They shop at our restaurants. They do all of those things. They are great citizens when they are there.

But when you hear people talk about this, one, the jobs don't exist; two, your members aren't trained for this. We talk about these issues from a national security issue and we talk about it from a reliability and resiliency issue, but can you just expound on the human level of where that ends up with your members and so many like that across the country?

Mr. Hofmann. I don't think there is any question that a greater level of reverence needs to be recognized to the men and women who make these systems work. No question.

Mr. Armstrong. I mean, when people just say, we will retrain you, do you know of -- I mean, do those jobs exist at any scale? Is there any place right now that if they were out of work in the next 3 days, is there somewhere they could go now in the renewable field where those jobs exist at any kind of the same capacity?

Mr. Hofmann. What I can say is, in my hometown, I am not too far away from the Palm Springs Windmills, and you will see lots of things out there, but one thing I have never seen is an employee parking lot.

Mr. Armstrong. Thank you. I yield back.

Mr. Rush. The gentleman yields back.

The chair now recognizes the gentlelady from New Hampshire, Ms. Kuster, for 5 minutes.

Ms. Kuster. Thank you very much, Chairman Rush, and thank you for convening today's hearing on the CLEAN Future Act. We have great jobs right here in New

Hampshire, from solar and wind and lots of renewable energy, so I am happy to share that with the committee.

Climate change poses an existential crisis to humanity, and the most important thing we can do to prevent not only our country but the world from experiencing the worst effects of climate change, including the dramatic weather patterns such as the storm that hit Texas this winter, is by eliminating carbon emissions. By putting the U.S. in a viable pathway to achieving that goal, the CLEAN Future Act is a significant milestone, and I look forward to working with my colleagues to getting it signed into law.

The CLEAN Future Act provides a historic investment to upgrade the resilience of our grid. And I am particularly excited about the clean energy microgrid grant program spearheaded by my colleagues, Representative Barragan and Clarke, which would help communities around the country create microgrids, units that are able to insulate themselves during times of crisis from the broader grid.

So, Ms. Silverstein, this question is to you. Would the grant program created by the CLEAN Future Act to install more microgrids for critical infrastructure help mitigate the impact of future large-scale blackouts like we saw in Texas? And how can we improve these grants to help more communities realize the benefits of microgrids?

Ms. Silverstein. Great question. Thank you very much. Yes, it is a wonderful idea, and, yes, it can make a huge difference to protect communities and critical facilities and community cores from future disasters of all kinds, including grid failures. But I believe that you can do better.

We have been working on microgrid technology for almost two decades now, and yet, today, almost every single microgrid grant is for an individual science project. There isn't enough interoperability, there isn't enough replicability, there aren't enough

standard packages. And, frankly, most of these situations aren't as different as they appear.

The more that you could do to get common instructions, engineering programs, packages of equipment put together in advance by doing an investment with DOE and the labs and research, the more that you can produce packages that are quickly replicable, that are economic, that are easier to evaluate and install, and put more of the money into communities quickly rather than into one-at-a-time studies that don't really add value to the rest of the industry quickly.

Ms. Kuster. Terrific. Thank you so much.

Switching gears, I want to brag for a minute on some of the great work that is happening in renewable energy right here in New Hampshire. One of our public housing authorities in my district, Keene Housing, has utilized power purchase agreements to install solar panels on the roofs of many of their multifamily housing units. These solar panels are reducing electric bills and carbon emissions. These savings will allow Keene Housing to improve the quality of life for residents, and long term, could free up capital to build new units and serve more Granite Staters.

Now, this won't surprise you, the biggest hurdle they faced installing these solar panels was cost. Ultimately, they were able to find creative ways of covering the expense, but this is an obstacle.

In your testimony, Ms. McIntyre, you mentioned the CLEAN Future Act should increase funding to install distributed energy sources. My bill, the Clean Energy Savings Program Act, which I was proud to introduce last year with Senator Merkley, would provide no-interest financing for exactly this type of project.

Can you explain how increasing funding for distributed energy sources would help

more individuals and nonprofits around the country realize the benefits of solar energy? And I might add, it is a win-win-win, not only lower energy costs, save the planet, and their jobs for installation.

Ms. McIntyre. Thank you, Congresswoman. And, you know, I really commend the work and the programs that you have going on in the State and the legislation that you have introduced.

And I agree, you know, being able to bolster the ability of particularly low-income communities and communities of color to have access to distributed energy resources by providing funding will help both them achieve the benefits of cleaner power sources, lower energy costs, as well as, again, enabling greater resiliency of the grid.

Having these resources -- and, again, the impacts of any disasters that could happen, you know, being able to have access to distributed energy resources helps the power keep going if those resources are -- if the crisis is going on, but also helps reduce demand from the grid in those times of crises.

Thank you for your work.

Ms. Kuster. Well, thank you so much. My time is up, but I look forward to working with this committee on this important bill.

And I will yield back to the chair.

Mr. Rush. The gentlelady yields back.

The chair now recognizes the gentleman from Alabama, Mr. Palmer, for 5 minutes.

Mr. Palmer, are you online? All right.

Now the chair recognizes the gentlelady from California, Ms. Barragan, for 5 minutes.

Ms. Barragan. Thank you, Chairman Rush, for holding this important hearing on the energy resilience, grid modernization, and energy efficiency sections of the CLEAN Future Act.

We have seen the deadly costs of extreme weather events influenced by climate change and the challenges they cause our grid. While there is no silver bullet to preventing these outages, investments in clean energy microgrids can help to keep the lights on in our most critical facilities.

The CLEAN Future Act includes the Energy Resilient Communities Act, legislation I have proposed with Representative Clarke, to provide funding and technical assistance for microgrids with priority for low-income and communities of color. It is critical that we center energy justice for these communities at the heart of the clean energy revolution.

Dr. Wayland, Black, Latino, and indigenous communities suffer the most from poor air quality and are hit hardest by climate-fueled weather disasters. These frontline communities have the most to lose if we fail to take decisive climate action.

How can investments in clean energy and energy storage, including microgrids, reduce the damaging climate and health impacts of fossil fuels to these communities?

Dr. Wayland. Well, thank you for the question. I think there are two ways that investing in these technologies that you mentioned would address some of the harms that these communities face. The first is by reducing, not just greenhouse gas emissions, but the air pollution that some of these communities are disproportionately affected by.

And the second is by making them more resilient in two ways. One is by reducing their energy burden. As Ms. Silverstein has mentioned, you know, when we

can reduce the energy burden, we actually improve the kind social resilience of these communities.

And the second is by helping to insulate them from disruptions in the energy supply. So microgrids, for example, in areas near public housing, in shelters where these communities might have to go if their power is out, these are critical for helping the resilience of those communities in the event -- during the event that might disrupt power.

Ms. Barragan. Thank you, Doctor. And a followup. In 2019, 546 microgrids were installed in the United States. Of these, 86 percent were powered, at least in part, by burning fossil fuels. Do you agree this trend will make it difficult to reach the CLEAN Futures Act's goal of 100 percent clean energy by 2035, and that the legislation's grant funding for clean energy microgrids can help reach the bill's goal?

Dr. Wayland. I agree with you. It is great that you mentioned the fact that so much of micro -- I mean, the basic microgrid is a diesel generator, and that is certainly not clean. And, you know, microgrids that are powering hospitals, that is an essential service that the microgrid provides right now, and most of those are run in part with diesel generators.

So I think that moving forward, what we need to do is make sure that we are building out microgrids that have a more diverse source and that is solar or clean hydrogen. So there are other ways of powering microgrids, and I agree with you that we are going to have to address that in order to meet climate and air quality goals.

Ms. Barragan. Great. Thank you.

Ms. McIntyre, one of the recommendations in your testimony is to give the Federal Energy Regulatory Commission tools to consider climate change when assessing the impacts of transmission projects in implementing national transmission policy goals.

Can you talk about what these legal tools are and how they would help to improve the reliability of the electric grid?

Ms. McIntyre. So, currently, there is uncertainty whether or not FERC has the explicit authority to consider the climate change impacts of various energy products, including electricity transmission. So we would like to give them -- have Congress give them the explicit authority to take that climate impact into account. This will then help -- and also to take in climate considerations in the buildout of transmission.

So if you take in the climate considerations as you are determining which transmission projects should go forward and where they are needed, that means that you are looking at where is the best path for a transmission project to either bring in, you know, renewable energy where it needs to come from and is accessing, you know, the clean energy that we need and taking it to where it needs to go.

And so, currently, without having those explicit authorities, you are just not being able to -- not giving FERC the tools it needs to ensure that we are addressing and building an electricity system that is going to be able to withstand the worsening climate crisis.

RPTR WARREN

EDTR ZAMORA

[5:07 p.m.]

Ms. Barragan. Right. Thank you very much.

With that, Mr. Chairman, I yield back.

Mr. Rush. The gentlelady yields back.

The chair now recognizes the gentlelady from Delaware, Ms. Rochester, for 5 minutes.

Ms. Blunt Rochester. Thank you, Mr. Chairman, for calling this important hearing on the CLEAN Future Act. And thank you to all of the witnesses for your testimony today.

The recent extreme weather event in Texas and parts of the Midwest exposed the need for a more resilient energy infrastructure, and as we all know, climate change is fueling extreme weather across the country and we need to work together to fix the vulnerabilities in our energy system and better prepare for future disasters.

A safer, cleaner, and more resilient energy system is possible with smarter planning and better decisions, which is why I am proud that the CLEAN Future Act includes the Open Back Better Act, which I recently reintroduced.

The Open Back Better Act invests in retrofits to public buildings, such as hospitals, libraries, and community centers, making them more energy efficient and more resilient against future threats. It creates good-paying jobs and prioritizes upgrades to low-wealth communities and communities of color, which are so often disproportionately burdened by the impacts of public health emergencies and natural disasters. And as we work to rebuild our Nation's economy in the wake of the COVID-19 pandemic, we need to

work toward a more resilient and clean energy economy.

Ms. McIntyre, during natural disasters and national emergencies, it is our mission to ensure safety of all Americans. How can more energy efficient and resilient public facilities enhance our ability to protect the public during times of crises?

Ms. McIntyre. More energy efficiency buildings will, again, help provide insulation, weatherization for buildings, and in particularly, you know, low-income housing, and better to be able to withstand the impacts of the weather-related events. So, you know -- and Texas was a prime example of very inefficient buildings. And so, you know, the impacts of the cold weather were felt much more by those communities and, again, inefficient buildings cause more stress on the grid. And so if you provide more efficiency and weatherization of buildings, then you enable lower energy demand and, again, then have less of an impact from the weather events on the electricity system.

Ms. Blunt Rochester. The Open Back Better Act prioritizes upgrades to low-wealth communities and communities of color. Can you talk about how we can ensure that these communities are active partners in building a more resilient energy system?

Ms. McIntyre. So that is one of the concerns that we have with some of the provisions in the CLEAN Future Act is, while it has provisions to take into account communities of color and low-income communities, it does not provide any guidance as how to meaningfully interact with those communities and include those communities in the decisionmaking of where funding is going, where the needs are the greatest. And so, you know, there needs to be, you know, stronger provisions to actually direct how the government can work with those communities and get their input.

Ms. Blunt Rochester. Thank you.

And, Dr. Wayland, following up on Representative Welch's question, can you talk about incorporating energy efficiency retrofits in public buildings and how that makes the community more resilient against future threats?

Dr. Wayland. Yes. That is a great question. We are strongly supportive of addressing the inefficiencies in public buildings from schools to city town halls and city buildings. And similarly to what Ms. McIntyre described in terms of the effects on the residential communities, you are going to lower the energy burden of the local governments. You will -- you will then make them more resilient in the face of any kinds of disruptions that happen to power. And many of those public buildings are the places of respite during those events for low-income communities and communities of color. And so making sure that those buildings are clean, efficient, and have backup power is really critical for equity issues in the face of climate change.

Ms. Blunt Rochester. And in my last 30 seconds, how can we ensure that the grid -- that grid resiliency efforts protect against multiple threats, such as hurricanes or cyber attacks?

Dr. Wayland. Well, that is a great question. And I think that, you know, we have to make sure that we are addressing, taking a multihazard approach when we are looking at the investments that utility are asking to make in upgrading the grid. So as Ms. Silverstein mentioned in the very beginning, we have to assume that these events are going to happen, and so we shouldn't just plan for the last thing that just happened. We should be looking at the full range of hazards that will confront a community.

Ms. Blunt Rochester. Thank you so much.

And, Mr. Chairman, thank you for the time. I yield back.

Mr. Rush. The gentlelady yields back.

The chair now recognizes the gentleman from Arizona, Mr. O'Halleran, for 5 minutes.

Mr. O'Halleran. I want to thank the chairman and the ranking member for their -- putting this committee together today, the panel, and the panel for the great discussion we have had today.

You know, today's hearing comes at a critical time for our Nation's energy transformation. Our natural disasters are not new. Their impacts on electrical grid are raising important questions about the reliability of our electric grid.

Arizona's grid infrastructure already faces constant threats from extreme heat waves, creating increased demand for electricity, and wildfires threatening these same valuable assets. I am thankful we are having today's hearing to examine how the CLEAN Future Act and other Federal policies can make our electric grid more resilient against threats posed by natural disasters and cyber attacks.

My first question goes to Ms. Silverstein. Section 218 of the CLEAN Future Act would establish a DOE program to help State, local, and Tribal governments with evaluation permitting and siting of interstate transmission lines. Your testimony highlights how over 700 gigawatts of rural generation projects have been unable to interconnect to the grid due to, in part, to delays in necessary transmission not being built.

Could you comment how improving the transmission siting and approval process will support rural economic development, decrease electric costs for consumers, and increase overall grid reliability?

Ms. Silverstein. Yes, sir. Thank you. The reason that so many new projects cannot get access to the transmission grid is because there is not enough transmission for

them to hook up onto. So the more that we -- because all of the transmission is full with the generators that are already using it. The only way to bring more generation onto the system is to build more transmission, frankly, and to make marginal improvements in the care and capacity of the transmission that we have. We are trying to do both.

But in order to build -- to really bring on and free up all of the capability of this new generation, we need much more transmission. That means much faster permitting. It means better siting. It means much more coordination and identification of the benefits. It also means, by the way, that one of the things we need to do is stop the old assumptions that the cheapest transmission is the best transmission to build. The cheapest transmission today is the transmission that we can get built as big and as quickly as possible, which means that if you need to take a dogleg, if you need to big it builder -- build it bigger -- excuse me -- those are the right things to do because it creates more value for the Nation faster.

So with more transmission, we can have more generation and storage added. We can have better reliability. We can reduce delivered economic costs and allow that new generation is out in rural areas. And so by building transmission to open up generation in those rural areas, we add tax base. We add the ability to bring new generation and new jobs into those regions.

Thank you.

Mr. O'Halleran. Thank you. And I have a couple of other questions, but I would like to ask everyone on the panel, how long do you think our grid system has been in this crisis situation over the last number of years?

Starting with anybody.

Ms. McIntyre. I will start. You know, we have been facing these weather

events for decades. And what has been happening is because of the climate crisis, those events are becoming more severe and creating even more damage to our systems. And so this is not necessarily new, but the severe impacts of them are becoming greater.

Dr. Wayland. I will say that in addition to severe weather, we face a number of threats that are growing. And in particular, this committee has talked about cybersecurity. That is a growing threat. And the changing nature of the grid in terms of it becoming more connected and more digitized only makes the threat even greater. And so cyber is something that we really thought about in terms of protecting personal information, you know, the front office kind of thing, and not necessarily cyber that will damage the operating systems, you know, of our grid, and that is changing and can lead, you know, not just to having an identity stolen but to having massive damage inflicted on the grid.

So there are a number of other things in terms of aging infrastructure in our workforce that are putting pressure on the grid, but I think that cybersecurity is a new thing that requires attention.

Mr. O'Halleran. And my time is up, and I yield. Thank you very much, Mr. Chairman.

Mr. Rush. The gentleman yields.

The chair now recognizes Ms. DeGette from Colorado. I don't see her on the line.

Then the chair will proceed and recognizes Mr. Veasey from Texas.

Mr. Veasey, are you on the line? I don't see Mr. Veasey.

We will move on and recognize Mr. McEachin from Virginia. I don't see Mr. McEachin from Virginia.

The chair now recognizes the gentlelady from Texas, Mrs. Fletcher.

Mrs. Fletcher, you are now recognized for 5 minutes.

Mrs. Fletcher. Well, thank you so much, Chairman Rush. Thanks to you and Ranking Member Upton for holding this hearing and for allowing me to be part of it. And I thank the witnesses for taking time to testify today.

I have had a day focused on these issues, starting with this morning's oversight hearing on the catastrophic failures here in Texas during the winter storm and the challenges to our grid system and the need for diverse fuel sources, and then, of course, this afternoon's hearing on the CLEAN Future Act and the things that we can do to build a more resilient grid system and power generation and delivery system across the country.

A lot of the comments today that I have heard are focused on some of the partisan and other divisions, but I think there is a lot of room for agreement, maybe more than it might appear from the hearing, and I really urge my colleagues to continue working together to address the challenges and opportunities before us.

As the representative -- or a Representative from the energy capital of the world and as somebody who witnessed firsthand the devastating impacts of the loss of power during the Texas winter storm from my home here in Houston, where, like people across my community, we had no power and no water in our home for days, I am hopeful that our witnesses can help shed a light on what we can do going forward to ensure that extreme weather hitting the grid doesn't result in grid events with a large loss of life and huge economic costs like we are seeing here in Texas right now.

So I want to start with Ms. Silverstein. In your testimony, you talk about how the required infrastructure of the next century will not appear without significant improvements in institutional infrastructure. And can you talk a little bit about or tell us

what new authorities the FERC and DOE would need to realize this goal?

Ms. Silverstein. Thank you. As I have said, I think that it is necessary for FERC to have greater authorities -- Ms. McIntyre talked about that -- and to be able to do permitting and planning. It is very clear that current planning [inaudible] structures and processes are not working effectively, and those need to be changed. Cost allocation needs to be changed hugely. DOE is working on a variety of planning capabilities and technologies that need to be changed.

And, frankly, one of the biggest challenges is the way we now assign cost to beneficiaries means that you never recognize all the beneficiaries, because everyone in the Nation would benefit from a macrogrid and from many of these improvements. But it is very difficult using current definitions and processes to identify beneficiaries and assign cost to them when they are not inside the little box that you are working within. So all of those things need to be improved.

We also need to, frankly, change institutional infrastructure with respect to how we organize and manage distribution systems, because all of the -- all of us sat in the dark because the distribution systems, once you take up all the critical facilities, there is no power left for everybody else. And if we had much smaller circuits and much -- the capability to sectionalize and cut up a distribution system, you could actually rotate power outages fairly among many more people.

The last institutional thing we need to do is to make critical facilities stand up and protect themselves in order to protect us. And it is just infuriating that all of the critical facilities don't have the kinds of clean backup power systems with battery and PV and combined heat and power or other stuff that can keep them up for a couple of days, including, by the way, compressor stations and a lot of wellhead production systems. If

they think they are that critical, they should start acting like they are critical instead of just lying low and whining later on.

Thank you.

Mrs. Fletcher. Thank you for that. And I agree; I mean, one of the challenges that we have heard here is that there needs to be, not just investment at the generators, but throughout the entire supply chain to make sure that we can get the power when we need it. And so that definitely resonates, as does the idea that we can roll the outages, which certainly we saw here. And there is a huge difference between having 2 or 4 hours without power and having 3 or 4 days without power, and those are really dramatic differences. So there those are helpful.

I am already running out of time, which is amazing. So I am just going to direct my last question to you and some additional questions for the record for our other wonderful witnesses. But can you just talk a little bit more about how the transmission and distribution circuits are designed and how that more precise approach that you were talking about can help in response to winter storms?

I will put the rest of my questions in for the record, and thank you all so much.

Ms. Silverstein. Thank you. Yes, circuits are designed very large, and you can use sectionalization devices to make them smaller and cut them up and reroute power. And we have been doing that a lot in California in order to do the wildfire shutoffs protections. But we don't have that in Houston. We don't have that in Austin. We don't have it in a whole lot of places across the country. And we need to be able to do that so that, for instance, sea level rise doesn't take out one part of a town and force the rest of the town to go down as well. That is what would have kept most of our homes from freezing and having pipes blow up.

Mrs. Fletcher. Well, thank you so much. I have gone over my time and, rather ironically, I have someone here working on fixing my pipes today. So, certainly, we are continuing to live with these challenges, and it is something we can learn from. I thank all of you for your time.

And, again, Mr. Chairman, thank you, so much for allowing me to participate. And I yield back.

Mr. Rush. The gentlelady yields back.

I want to return to the roster and ask these members who didn't have a chance to ask questions. I don't see them on the camera, but I am going to ask are they present.

Is Mr. Bucshon present?

Is Mr. Duncan present?

Is Mr. Palmer present?

Is Ms. DeGette present?

Is Mr. Veasey present?

Is Mr. McEachin present?

So seeing that they are not present, the committee staff, both the Republicans and the Democrats, are -- well, let me just say to conclude the hearing, that concludes the witness' questions. And I would like to thank each and every one of our dear, respected, and beloved witnesses for their participation in today's hearing. We want to thank you for your durability and for your endurance for this hearing. Thank you very much for your contributions to our Nation's energy future.

I want to remind members that pursuant to committee rules, they have 10 business days to submit additional questions for the record to me, answered by the witnesses who have appeared before us. And I ask each witness to respond promptly to

any such questions that you may receive.

Before we adjourn, I don't know -- we are awaiting the staff's review of the unanimous consent request, and as they are reviewing that, we want to take a moment to allow them to finish their review so that we can be prepared for a UC request.

So I will ask the ranking member, Mr. Upton, are you aware, are they -- are they -- have your side and the minority side agreed to the UC request?

Mr. Upton. I am not aware of any, but, if not -- if so, I will come back to you.

Mr. Rush. Okay. All right. Well, we will await. I will ask the witnesses -- allow the witnesses to depart, and then Mr. Upton and I and whoever the other members of the subcommittee will remain online until we get the staff concurrent with the UC request.

So I don't want to keep the witnesses. So you are free to leave at this moment. And, again, thank you each and every one of you for your outstanding testimony. Thank you.

Voice. Thanks, everybody.

Mr. Rush. So, Greg, you and I and Mr. Armstrong are still on the video. And so we just have to bid our time, but while we are waiting, I like that little snide remark that you made about my name. Yeah, I am going to start calling you Downton as opposed to Upton.

Mr. Upton. I got a lot of nicknames.

Mr. Rush. The minority staff signed off.

And so I request unanimous consent that the reference and testimony and other information be entered into the record en bloc, and then there are about 20 documents. So I am requesting, then, unanimous consent that the documents be entered into the

record en bloc.

Without objection, so ordered.

And at this time, the subcommittee stands in adjournment. Thank you.

[Whereupon, at 5:29 p.m., the subcommittee was adjourned.]