The subcommittee met, pursuant to call, at 10:02 a.m., in Room 2123 Rayburn House Office Building, Hon. Paul Tonko [chairman of the subcommittee] presiding.

Members present: Representatives Tonko, Clarke, Peters, Barragan, McEachin, Blunt Rochester, DeGette, Schakowsky, Matsui, McNERney, Ruiz, Dingell, Pallone (ex officio), Shimkus, McMorris Rodgers, McKinley, Johnson, Long, Carter, Duncan, and
Mr. Tonko. The Subcommittee on Environment and Climate Change will now come to order. I recognize myself for five minutes for the purpose of an opening statement.

In late 2015, driven by American leadership, the world came together to acknowledge the threat of climate change and make plans for cooperative global efforts in mitigation, adaptation, and finance.

The purpose is to reduce greenhouse gas emissions to limit
global temperature increase to well below 2 degrees Celsius. The ingenuity of the Paris Agreement is that it builds from the bottom up. It does not dictate specific reductions or remedies. Each country sets its own target, submits a Nationally Determined Contribution, or NDC, to achieve those targets, reports on their emissions, and, hopefully, increases their ambition over time.

The United States, for example, committed to reduce its emissions by 26 to 28 percent below 2005 levels by 2025. This achievable commitment was based on a plan that included a number of actions: adopting fuel economy standards for light- and heavy-duty vehicles, cutting carbon pollution from new and existing power plants, reducing methane emissions, addressing building sector efficiency, and developing new alternatives to HFCs.

Today, despite the obvious and growing threat posed by the climate crisis, many of these policies are being delayed or undone by the Trump administration. The Rhodium Group's "Taking Stock 2018" report found that U.S. emissions under current policy are heading toward a 12 to 20 percent below 2005 levels in 2025, well short of the U.S. target.

In June of 2017, President Trump announced his intent to
withdraw the United States from the Paris Agreement, although it is important to note that this cannot be done formally until November of 2020.

Still, as time goes by, I know that many of his supporters, possibly including some in this room, will come to regret this decision. President Trump may not understand the importance of international climate cooperation, but thousands of others, including states, cities, businesses, and universities have stepped up and said, "We are still in."

If you add them all up, these non-federal actors would have the third largest economy in the world. And their commitments are not just lip service. They are taking tangible steps and filling America's leadership void through organizations such as the United States Climate Alliance and the Climate Mayors coalition.

Last year, California even organized the Global Climate Action Summit with world leaders and garnered a new round of commitments.

To support these efforts, the climate organization America's Pledge has sought to compile and quantify subnational actions. According to their "Fulfilling America's Pledge" report, these actions could meet about two-thirds of what is needed for
America's commitment.

While these efforts are keeping our targets within reach, they are not enough. More must be done. We need federal policies and we need real leadership.

While President Trump has pulled America's seat at the table, other countries, including China and India, continue to write the international rules on emissions monitoring, reporting, and transparency, and work towards achieving their NDCs.

I have heard some spurious arguments from members in the past about the Paris Agreement and the commitments of other countries. But people must understand what we give up by walking away.

If those members do not trust these other countries, that is an important reason to stay in and fight for stronger reporting and transparency rules. And if members really want other countries to set bolder targets, the United States should not set such a poor example and hurt our credibility.

At our last hearing, I was pleased to hear a new bipartisan consensus around the realities of climate change. America's NDC is a voluntary, non-binding commitment. If anyone thinks it is too difficult to achieve, they should say so and push for a different target.
But if we agree that climate change is a problem, there is no reason to support the president's withdrawal. Our subcommittee members also seem to agree that energy innovation is an important part of any climate solution.

In this vein, I want to remind my colleagues of the announcement that coincided with Paris under the banner of "Mission Innovation." Twenty countries committed to doubling their clean energy R&D investment over five years, which will be bolstered by private sector commitments.

I hope we can expect those calling for more innovation to also support that initiative. Global problems require global cooperation. We accept this when it comes to countless security, health, and economic issues, and we know that climate change impacts all of these areas, and more.

We cannot hide from the mantle and the accompanying responsibility of being the greatest nation on Earth. The United States must lead. Others will be guided by our example.

I said in our first climate hearing that we are behind, but it is not too late. We are still in Paris and there is still time to reach America's 2025 target.

But that takes Congress getting serious. It means pushing back on administration actions that take us in the wrong direction
and it means putting forward new policies that will accelerate clean-energy deployment and reduce climate pollution.

Thank you all for being here this morning. I look forward to hearing from our witnesses. Before we introduce them, I will recognize Mr. Shimkus, our Republican leader on the Subcommittee on Environment and Climate Change, for five minutes with his opening statement.

Welcome.

Mr. Shimkus. Thank you, Mr. Chairman. I think a useful purpose of the hearing this morning will be to learn more about the technologies and actions that are expected to accelerate the reduction of U.S. carbon dioxide emissions.

I am not sure all of these actions will be viable or cost effective. I am also not sure that all these actions will be in the best interests of the United States, especially if they end up putting us in an economic or strategic disadvantage to our global competitors.

But it is important to gather this information for the committee's future consideration. Another purpose of this hearing, as you have indicated, is to examine the importance of the United States staying in the Paris Agreement, which President Obama formally accepted in late 2016, from which President Trump
announced less than 10 months later in June 2017 that the United States would withdraw under the terms of the agreement.

Fair points may be made about what the Paris Agreement represents in terms of a broad-based international cooperation but that is not really the issue here.

The issue is how the Obama administration made expensive commitments that would bind U.S. action without broad-based support from congressional policymakers. The commitments, the financial pledges, and the costly burdens from implementing regulations that will be needed to meet our obligations were not submitted to or approved by Congress.

Without that national political buy-in on such a complicated policy that would affect all sectors of the U.S. economy and people's daily lives, it is no wonder the new administration would change course.

The consumer cost and competitive harm the commitments pose to the nation deserve close and careful attention and approval from policymakers. And this is not a U.S. problem alone. While other developed nations may be, quote, unquote, "staying in" the agreement so far, they are not actually following through on their promises.

The Climate Action Tracker, a European consortium of
research organizations, found that nations' commitments will not meet the actual goals in the Paris Agreement, and the Washington Post reported on this research last October. Most major nations are making few if any efforts to meet their goals.

The European Climate Action Network, another think tank, reported last summer that all European Union countries are off target. No single country in Europe is performing sufficiently to meet the Paris Agreement goals and those that have been making the most progress on their promises did not make any large commitments in the first place.

At the same time, we have the United Nations Gap Report released this past November which assessed the situation and reported that all these countries will have at least to triple their efforts to meet the Paris Agreement's basic goals, if not increase their goals fivefold to meet the more stringent temperature targets. I am not sure that is going to go so well.

In France, we have witnessed the Paris riots, which were sparked over government's climate-related proposal to increase gasoline taxes on the rural French.

In Germany, according to news reports last week, a climate law to get the nation back on track with its Paris emission goals by 2030 has been threatening to break up the coalition government.
in Germany. Germany, of course, has turned away from nuclear
energy and increased coal production as well as emissions over
the past five years.

Finally, as we discussed in our hearing three weeks ago,
there is a developing -- there is the developing world, which
is participating in this agreement but will produce almost all
the growth in future carbon dioxide emissions as billions of
people understandably seek access to affordable energy.

The plain fact here is goals of the international climate
agreements, which are to move towards lower-emitting systems in
energy, transportation, industry, agriculture are not going to
work unless there is sufficient affordable technology to deploy
on a massive scale.

You cannot get there in a meaningful way with wind and solar
without undermining industrial capacity and economic well-being.

So I will continue to say, Mr. Chairman, when it comes to
addressing climate change let us take action. But let us be smart
and pragmatic about it. We should focus on realistic solutions
to prepare for the future and on policies that work for the
American people.

And with that, Mr. Chairman, I yield back the balance of
my time.  

Mr. Tonko. Thank you, Mr. Leader, and the gentleman yields back.

The chair now recognizes Mr. Pallone, chairman of the full committee, for five minutes for his opening statement.

Mr. Pallone?

The Chairman. Thank you. Thank you, Mr. Chairman.

I am not sure I want to criticize Mr. Shimkus because he is probably more of an ally on this than many on the other side of the aisle. But I do want to take -- I do take somewhat offense, John, to the fact that when you talk about these other countries that are -- that continue to adhere or want to adhere to the Paris Agreement, at least they are trying.

I mean, sure, it is true that, you know, Macron tries something and he gets resistance. Sure, it is true that the chancellor in Germany tries something and they meet resistance. I am not arguing that. I think we all know that. We read the news.

But at least they are saying that the Paris Agreement as a goal makes sense and that they would like to try to reach those goals. The reason that I am so critical and will be -- continue to be of our president is because he says the opposite. He says,
I don't want to meet the goals. I want to withdraw from the Paris Agreement.

He is not making any attempt to move forward to address climate change. In fact, he is moving in the opposite direction. The initiatives like the Clean Power Plan and the fuel efficiency standards that were put in place under President Obama he wants to scrap.

So I think it is a little disingenuous, I guess, to criticize other countries that are trying to meet the Paris goals and leaders that are trying to meet the Paris goals. Sure, they are going to -- you know, they are going to have a hard time. There are going to be those that push back. They are going to have pitfalls. But they are at least trying.

The problem here is that our president is saying the opposite. He said, I don't want to do that -- I don't care. You know, I am going to move in the opposite direction.

And I think that is what is really bad is just abrogation of American leadership that goes along with saying you are going to withdraw from the Paris Agreement.

But in any case, I know I am criticizing you but I don't mean to do it too hard because you are probably the best friend we have.
Anyway, I wanted to thank Chairman Tonko for scheduling this hearing as the committee continues to discuss the growing crisis of climate change and the ways that we can combat it.

For the last two years, President Trump, his administration, and Republicans here in Congress have repeatedly pushed actions and policies that would only make the crisis worse.

We are here today to discuss one of these actions. President Trump's decision to pull out of the Paris Agreement is unjustified and dangerously shortsighted. It abdicates U.S. leadership on global climate action -- an issue where America has always been a leader -- and breaks our promise to all nations who joined the historic agreement.

I believe the Trump administration's retreat puts the health and safety of our communities at great risk and seriously jeopardizes our future security. It also puts our economic future at great risk as the world embarks on a major transition to a low-carbon economy.

President Trump now wants to pull us out of that agreement. The Paris Agreement -- an agreement reached by nearly 200 nations -- was an important unified stand in the fight against our changing climate.

It sets a strong foundation for action that will accelerate
It is also our best hope of mobilizing the global action needed to avoid catastrophic changes to our environment and the Paris Agreement represents a significant departure from past efforts to secure international cooperation on climate change. It allows each nation to design its own emission reduction strategy that is best suited to the unique circumstances of its society and economy. Importantly, the Paris Agreement applies to all parties to the Convention, including India and China. It also includes critical transparency and accountability measures to ensure countries are meeting their emissions reduction goals and have the flexibility to make any necessary adjustments to stay on track.

The Obama administration's plan to meet the goals of this agreement were reasonable, achievable, and balanced. It provided a framework in reducing U.S. emissions while also growing our economy.

More energy-efficient appliances, buildings, and vehicles result in lower costs for consumers and keep our manufacturing industries competitive globally, all while lowering emissions
of harmful air pollutants.

The plan also calls for controlling methane emissions from the oil and gas sector, which was a long-overdue and sensible step, and so too was curbing carbon emissions from the power sector under the Clean Power Plan.

In fact, the reductions required by the Clean Power Plan were so reasonable that most of the power sector is now meeting them. And, yet, the Trump administration has methodically stalled or rolled back all these initiatives.

The administration's actions reflect a determination to lock in fossil fuel dependence for consumers, reversing meaningful progress and setting the planet on a dangerous course.

The good news is that the rest of world and many states, cities, and businesses here in the United States have rejected the Trump administration's retreat on climate change.

They have declared, "We are still in." They are leading the way to cleaner energy, greater energy efficiency, lower consumer costs, more resilient communities, and new technologies and business.

While each individual contribution by these nonfederal actors may be small, together they add up to significant emission reductions and, just as importantly, their experience lays the
foundation for future progress.

I am going to sum up by saying the time for action to avoid
the worst effects of climate change is growing short, but at a
minimum, the U.S. must fulfill its commitments that we made in
the Paris Agreement.

And the federal government shouldn't just stand on the
sidelines. We have to show we are still committed to the global
agreement.

Thank you, Mr. Chairman.

Mr. Tonko. And Chairman Pallone yields back.

Okay. The chair now recognizes Mr. Walden, Republican
leader of the full committee, for five minutes for his opening
statement.

Mr. Walden?

Mr. Walden. Good morning, my friend. Thanks for having
this hearing as well. I think it is important to point out a
couple of things right out of the gate.

The U.S. is still a part of the Paris Agreements -- Paris
Accords -- and will be until 2020. The Trump administration
negotiators were credited recently with helping forge a
multinational agreement on how to measure emissions so that all
countries that are involved would have some higher level of
confidence that each other were actually reducing the emissions they said they were and they got international credit for that.

I think part of what we are after is, again, pursuing an agenda of U.S. innovation, conservation, adaptation, and preparation. We can lead the world in this space and we should.

We just don't want to repeat the mistakes that others have made in their laboratory work, if you will, trying to tackle this issue.

They have had riots on the streets in France since November as consumers said the direction France went with the high cost of gasoline was more than they were willing to bear. We need to keep consumers in mind in this discussion.

We are ready to work on developing policies, in fact, I would say, build on the policies that we developed over the last several Congresses in this space to make sure that we have an electric grid that is reliable and secure and has the capacity to be able to feed into renewable energy.

We have been big advocates for battery storage enhancement and, indeed, in my district there is a partnership between NextEra and PGE to have one of the biggest battery storage energy sectors in the United States. It is the biggest, it is the first, and they will link renewable energy into battery storage to help bring
more firm baseload power to the grid. That will replace energy
now generated from coal.

Our country invests in these national labs that help develop
this technology and there is more work to be done there. You
know, we have learned over the years how these policies rapidly
transform the nation's electricity system from a system designed
for the economical and reliably dispatch of power to a system
focused on meeting federal emissions caps can have unintended
consequences.

This rapid transformation, which Congress opposed, would
have driven out major sources of affordable energy, threatened
reliability and security, and driven up consumer electricity
bills.

To achieve the goals I think we could all find some common
ground along we also have to make sure that we don't encourage
unintended consequences that could affect consumers negatively
to the point that they riot in the streets, as they are doing
in France, as well as put the grid in peril.

We learned that even with the economically harmful impact
of these and other policies targeting the fuels we use and cars
we drive, the goals proposed by the Paris Agreement still could
not be met.
The policies, according to the administration's own estimates, would get maybe 60 percent of the way there, and I am talking about the Obama administration now.

Even Secretary Kerry noted at the time the negotiations that the United States or even all the developed world cut their CO2 emissions to zero it would still not offset the emissions coming from the rest of the world.

So, again, we can be a leader in developing new technologies that we should sell to the rest of the world to reduce their emissions. We have got to be smart about how we do this.

In short, commitments in Paris were made without a clear plan to meet those promises without a full view of the cost and certainly not a plan that had broad bipartisan support in Congress.

That is what we would like to see developed here, Mr. Chairman, is a bipartisan plan, going forward. This focus on U.S. commitments to the Paris Agreement is the centerpiece for our nation's climate policy. It kind of misses the point of what we should focus on if we want to make a difference in global emissions while strengthening the economy.

We should not lock ourselves into a narrow vision of what is possible. We must consider the realities of global energy
systems and the need for affordable reliable energy access around the world.

We are fortunate in America to have electrified nearly every home and business in the country. There are many parts of the world that seek electricity for the first time. They will not be denied that. So let us work with them to figure out how to do it in an environmentally sensitive way.

Let us continue to work, as we have done in past Congresses, to reduce barriers to innovation, enable the United States to deploy new technologies to drive economic engines of the future and make realistic headway in curbing emissions from advanced carbon capture to nuclear technology to innovative hydropower solutions.

And we also have to look at things I care passionately about in my district in Oregon. The IPCC report going back to 2007 says sustainable forest management would help. We had 68 million tons of carbon emissions for the fires in California last year alone.

Now, not all those are forests -- I get that -- but there is a lot of work that has been pointed out we could do to reduce the excess fuel load in our forests that reduce emissions of more than just carbon -- the other poisons that go up at the time --
if we could come together in a bipartisan way on that.

So, Mr. Chairman, I look forward to working with you as we always do and thank you for having this hearing, and I yield back.

Mr. Tonko. Thank you, and Republican leader yields back.

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

Now we welcome the witnesses to this subcommittee hearing. I thank them for taking the time and sharing their intellect with us.

Let me introduce our panel. First, we have Ms. Carla Frisch, principal with the Rocky Mountain Institute; then Mr. Samuel Thornstrom -- Thernstrom, I am sorry -- chief executive officer of the Energy and Innovation Reform Project; Mr. Nathan Hultman, director of the Center for Global Sustainability, associate professor at the University of Maryland School of Public Policy; and Mr. Andrew Light, distinguished senior fellow, World Resources Institute.

We thank, again, all of our witnesses for joining us today. We look forward to your testimony and thank you for sharing time with the subcommittee.

At this time, I will now recognize each witness for five
minutes to provide his or her opening statement. Before we begin, I would like to explain the lighting system. In front of our witnesses is a series of lights.

The light will initially be green at the start of your opening statement. The light will turn yellow when you have one minute left. Please begin to wrap up your testimony at that point and the light will turn red when your time has expired.

So we will begin with Ms. Frisch. You are recognized for five minutes, and welcome.

STATEMENTS OF CARLA FRISCH, PRINCIPAL, ROCKY MOUNTAIN INSTITUTE; SAMUEL THERNSTROM, CEO, ENERGY INNOVATION REFORM PROJECT; NATHAN HULTMAN, DIRECTOR, CENTER FOR GLOBAL SUSTAINABILITY, ASSOCIATE PROFESSOR, UNIVERSITY OF MARYLAND SCHOOL OF PUBLIC POLICY; ANDREW LIGHT, DISTINGUISHED SENIOR FELLOW WORLD RESOURCE INSTITUTE, UNIVERSITY PROFESSOR, GEORGE MASON UNIVERSITY

STATEMENT OF MS. FRISCH

Ms. Frisch. Thank you, Chairman Tonko, Ranking Member Shimkus, and members of the subcommittee for inviting me to testify and for your leadership in focusing on climate change.

I am a principal at the nonprofit nonpartisan Rocky Mountain Institute, where we work on market-based low-carbon solutions.
Cities, states, and businesses and others have been working to address climate and the environment for decades. But in the past two years, they have scaled up their efforts and come together more formally and, in part, that connects back to the announcement of the intent to leave the Paris Agreement.

Within 72 hours from that announcement, a very diverse coalition of over 1,200 states, cities, businesses, universities, counties, tribes, faith-based organizations, hospitals, and others came together, and today that coalition is more than 3,600 members.

Their leaders have committed to reduce their emissions, not only because it is good for the climate but because it advances the interests of their citizens, their consumers, and their shareholders.

Are these commitments meaningful? America's Pledge set out to find that out. Rocky Mountain Institute worked on analysis which found that given existing commitments, the U.S. is, roughly, two-thirds of the way towards meeting the original commitment in Paris and broader engagement has the potential to put us within striking distance of the Paris Agreement.

That means scaling high-impact near-term climate strategies. But even since we published the report progress has
been made. In the last three weeks alone, five gigawatts of coal retirements have been announced, and also in the electricity space more than 100 companies, including many Fortune 500 companies, have committed to 100 percent renewable energy and they are following through on those commitments and taking advantage of the lower technology costs of solar and wind, which continue to fall. Cities are doing that, too.

That clean electricity is powering clean electric transportation. Late last year, we passed the 1 million electric vehicles sold mark in the U.S. and sales have grown since then, and one-third of our public buses are on track to become emissions-free, which could significantly improve health and air quality and also reduce costs for transit authorities, and that in part is driven by lower battery costs, as Ranking Member Walden mentioned.

That clean electricity is also powering homes and businesses. Using electricity to heat our homes and water is more efficient than using natural gas and burning that natural gas directly on site.

It improves indoor air quality and it reduces greenhouse gas emissions. And acknowledging that potential, New York State has required their electric utilities achieve a portion of their
energy efficiency savings through deployment of efficient
electric heat pumps.

So if we continue to scale and focus on these two priorities,
rapidly cleaning up electricity production and using that clean
electricity in our homes, businesses, and transportation systems,
we could address up to 70 percent of U.S. greenhouse gas emissions.

And the nation's rural electric co-ops have taken notice
of that and they are moving forward to focus on cost-effective
beneficial electrification. States that have taken climate
actions like these find that they are benefitting their economies
and strengthening their community.

Through the bipartisan U.S. Climate Alliance 21 governors
have come together to lead on climate change including many
recently-elected governors. Their climate policies have
attracted billions in investment and have helped support more
than 1.6 million clean-energy and energy-efficiency jobs.

Together, coalitions like these are demonstrating in real
time how to deliver cost-effective climate action from the ground
up.

Despite this tremendous progress, we need faster action.
To avoid the worst impacts of climate change and get back on
track for IPCC, we need action from all levels of government and
participation from civil society.

It is not possible to solve the climate crisis without state, city, and business action. It is also not possible to solve the climate crisis without strong and sustained federal policy.

The good news is we don't have to start from scratch at the federal level. Federal reengagement can build on the great momentum and hard work that states, cities, and businesses have underway.

We have to have both to ensure that America continues to set the standard for international leadership.

[The prepared statement of Ms. Frisch follows:]

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Mr. Tonko. Thank you, Ms. Frisch.

Next, we will move to Mr. Thernstrom. You are recognized, sir, for five minutes.

STATEMENT OF MR. THERNSTROM

Mr. Thernstrom. I would like to thank the chairman, the ranking member, and members of this subcommittee for the opportunity to speak on behalf of the Energy Innovation Reform Project.
The EIRP promotes public policies to accelerate the development of advanced energy technologies to improve the affordability, reliability, safety, and security of America's energy supplies and our energy economy.

As Mr. Tonko and Mr. Walden both noted, President Trump announced in June 2017 his intent to withdraw the U.S. from Paris but for procedural reasons the U.S. withdrawal cannot take effect until November of 2020. So we are still in.

Whether one agrees or not with the president's decision, he does have the authority to make it and I tend to see his decision as a reflection of the challenges in climate policy that Paris tried to paper over. Resolving these challenges should be the focus of our attention and I think a number of remarks today have already indicated that.

Our central challenge is that effective mitigation depends upon the availability of commercially competitive clean energy technologies more than it requires treaties or other international agreements.

We are making great progress with this challenge, as other witnesses will testify to, but much more remains to be done. If we can develop these technologies, international agreements can constructively contribute to their global dissemination.
If we do not develop them, nations are unlikely to meet commitments made under international agreements and, in fact, many nations are not on track to meet their Paris pledges, suggesting that their ambitions exceed their abilities.

Aspirational international agreements may reflect worthy ambitions. But domestic policy is where the decisive decisions are made. Paris appropriately focused international attention on each nation's domestic actions and that is where a constructive conversation must occur.

Ultimately, the Paris Agreement was unworkable for the U.S. because it was a substitute for rather than the product of a domestic political consensus. Indeed, the lack of settled domestic U.S. policy was among the reasons that Paris was an agreement rather than a treaty.

Trying to make domestic policy in Paris rather than in Washington was a mistake, I believe. It circumvented the role of Congress and specifically ignored the importance of implementing legislation and ensuring alignment between America's domestic policy and our international commitments.

America cannot address a complex challenge like climate change without bipartisan agreement on the way forward that is enacted in federal law.
After climate legislation failed in the Senate in 2009, the Obama administration pursued its domestic policy goal through the Clean Power Plan which was stayed by the Supreme Court. The Trump administration is seeking to implement an alternative regulation, which will certainly face judicial scrutiny of its own.

This back and forth demonstrates the fragility of policy made through regulations rather than law just as agreements are poor substitutes for treaties.

Now, many climate advocates have despaired of enacting bipartisan legislation and have consequently sought alternatives. At EIRP, we believe that there is no substitute for sound national policy embodied in law and so we work to promote that.

The principal objective of federal climate legislation should be to promote innovation in a broad portfolio of clean energy-related technologies and ensure their economical use over time.

A focus on accelerating technology innovation in order to drive down the cost of decarbonization while avoiding the zero-sum politics of some popular climate proposals is a necessary first step.
As a complement to innovation policies, clear and durable environmental regulations would also permit innovators and investors to cost effectively modernize America's energy system. I do want to emphasize the importance of getting the relationship between public policy and the private sector right.

This will require a mix of regulatory reforms and public and private investments that must be appropriate to the complexity of the task, not the product of a formulaic or ideological approach.

Also, as my written testimony emphasizes, the decarbonization literature is very clear about the crucial importance of developing a diverse mix of energy technologies and resources rather than taking a narrow path that relies on renewables alone.

Innovation initiatives must be designed to produce clean energy that is both abundant and affordable. If clean energy is too expensive or impractical in other respects, it won't be used broadly or adopted sufficiently rapidly.

Our challenge today is to combat climate change in a manner that strengthens America, our economy, and our international leadership.

At EIRP, we believe that federal policies to accelerate
Thank you all very much for your time.

[The prepared statement of Mr. Thernstrom follows:]

Mr. Tonko. Thank you, Mr. Thernstrom.

And now we will move to Mr. Hultman. Mr. Hultman, you are recognized for five minutes.

Thank you.

STATEMENT OF MR. HULTMAN

Mr. Hultman. Thank you, Chairman Tonko, Ranking Member Shimkus, and members of the subcommittee for inviting me to testify here today on the essential role of subnational actors in an overall comprehensive strategy to set American climate policy on a path toward renewed and reinvigorated leadership.

I am director of the Center for Global Sustainability at the University of Maryland School of Public Policy and served as a lead author on the recent report, "Fulfilling America's Pledge: How States, Cities, and Businesses Are Leading the United States to a Low-Carbon Future."
It is an honor to share with the committee my perspective on how subnational efforts in our country are driving progress today and laying the groundwork for an effective comprehensive American strategy to address climate and economic issues of fundamental importance to our country.

My message today is in three parts. The first part answers the essential question of what does it all add up to and describes the significant impact resulting from accelerating subnational climate actions in our country.

The second part illustrates how these actions can provide a path to comprehensive American climate strategy that includes diverse subnational actors as a basis to support and enhance additional progress through new federal action.

The third part underscores how subnational American leadership combined with a reinvigorated federal engagement can catalyse global action to accelerate our ability to respond effectively to the climate crisis.

In recent years, coalitions of subnational actors have formed to enhance their own communities' interest in climate action. These coalitions represent well over half the U.S. population of over 173 million people and nearly 60 percent of U.S. GDP and they are globally significant, representing the
equivalent of the world's third largest economy and the world's fourth largest greenhouse gas emitter.

A key question, however, is whether these actions from these groups will make a difference. The answer is yes. Our study estimates that existing commitments from subnational actors are already making a significant impact with additional near-term reductions possible.

Without these subnational actions, we estimate that U.S. emissions would grow slightly between now and 2025 and it is in this context that the contribution from subnational actors today is so important, turning that potential 3 percent growth in emissions from today into a 17 percent reduction below 2005 levels by 2025.

And more is possible. Using the tools available to them today, states, cities, and businesses could drive U.S. emissions close to but not quite reaching the U.S.-Paris target to, roughly, 24 percent below 2005 levels by 2025. Such actions could include more rapid expansion of renewables, reductions in methane leakage, increased building energy efficiency, accelerated coal power retirements, land sector policies, and a variety of other approaches across sectors.

And, indeed, many of these actors are already stepping up
to do more, particularly after the recently mid-term elections.

So existing commitments are extraordinarily helpful, making a real and meaningful difference today during a period of federal inaction. Nevertheless, even additional subnational commitments will likely not be sufficient to get us fully on track towards a long-term trajectory consistent with science-driven climate goals if this work of subnational actors to implement more ambitious climate actions does provide a basis for accelerating economy wide climate action in the future.

For example, subnational actions could potentially deliver accelerating emissions reductions across the U.S. economy, increasing our decarbonization rate from, roughly, 1.6 percent per year before 2025 to, roughly, 2.1 percent per year thereafter. This rate is close to the, roughly, 2.3 percent annually needed to be consistent with long-term climate goals. But the key currently missing boost to this activity would be broad engagement by the U.S. federal government.

In this way, subnational actions are laying the groundwork today for faster action under an essential comprehensive approach that integrates the significant policy authorities across our federal system.
Subnational action can also impact climate outcomes by influencing the international community. In climate change, U.S. global leadership matters. We are the world's second largest emitter and what we do here in many ways sets the tone for the level of climate action globally and this, in turn, can raise the chances of our global success in addressing this immediate and growing challenge.

The fact that American subnational actors are still making significant progress in reducing our own emissions is an important signal to other countries that the U.S. is still remaining engaged and delivering real change.

In summary, we have seen a groundswell of climate action over recent years with leadership from all corners of America. In doing so, these states, cities, businesses, and others have also helped create the conditions for a strong federal answer to their own climate leadership.

Thank you.

[The prepared statement of Mr. Hultman follows:]

**********INSERT 3**********

Mr. Tonko. Thank you, Mr. Hultman.

And now to conclude, Mr. Light, you are recognized for five
Thank you. STATEMENT OF MR. LIGHT

Mr. Light. Thank you, Chairman Tonko, Ranking Member Shimkus, and the members of the subcommittee for inviting me to testify.

I am Andrew Light from the World Resources Institute and also from George Mason University. I will address the international implications and limits of U.S. non-federal action on climate change.

I previously served at the Department of State as one of the senior officials working on the creation of the Paris Agreement on climate change. I am going to touch on four points summarized from my written testimony.

One, the Paris Agreement remains essential for international cooperation on climate change. Two, other countries continue to take ambitious steps to reduce their emissions. Three, efforts by non-federal actors have been embraced internationally. However, fourth, reengagement by the federal government is a geopolitical necessity.

First, let us start with Paris. While President Trump has
announced his intention to withdraw from the agreement, over 190 countries are still actively working to implement the agreement's goals.

And I agree with your characterization, Chairman Tonko. These targets were all done in-country. They were nationally determined. They were not negotiated in Paris. They were not determined by the Paris Agreement. That is very important.

Paris is a success because part -- because the first set of commitments under it achieved higher than expected ambition, significantly improving projections of temperature savings over prior estimates.

Moreover, parties are expected to make continual pledges of increasing ambition over time to put the temperature goals of the agreement within reach.

Second, the agreement fulfills a long-sought goal of the last three presidential administrations, both Republican and Democratic, of creating a set of common rules for all parties on reporting transparency and review of their progress on meeting their targets regardless of their development status.

So what about progress in other countries? I am going to focus here on China and India because concerns about them were raised in recent hearings before this subcommittee.
Both will need to do more. But under Paris, they are demonstrating ample domestic ambition. China is leading the world in renewable energy investment, committing to spend over $360 billion through 2020, which is expected to create 13 million new jobs.

China launched a national emissions trading system for its power sector, which will eventually become the largest in the world. In 2017, the government halted or delayed over 150 coal plants.

China remains the world's largest emitter of carbon dioxide but committed under Paris to peak emissions by 2030 at the latest and experts argue that they could easily peak as early as 2025.

India's Paris targets include a goal of 40 percent electricity generation from non-fossil sources by 2030. Prior to setting these target, Prime Minister Modi increased the previous government's solar energy goal by himself by five times to 100 gigawatts by 2022, adding 75 gigawatts of wind, biomass, and small hydro, creating an estimated 330,000 new jobs.

The number of planned coal plants has plummeted, shrinking by a quarter in the first half of 2018. What about the international impact of U.S. subnational action, which we have heard about so far?
The groundswell of activity in the U.S. has been widely embraced. German Chancellor Angela Merkel commented that it emphasizes the support for the climate agreement across large parts of the United States.

It is also spurring similar subnational coalitions abroad, including in Japan. States have also increased their bilateral programs. California initiated programs to work with China on developing renewable energy and cooperating on zero-emissions vehicles, energy storage, and grid modernization while the U.S. stayed on the sidelines.

But there are limits to subnational action that require federal reengagement. Here are three reasons.

First, U.S. federal leadership is absolutely necessary as states and cities don't have a seat at the table in international negotiations. Active participation is essential to ensure that the Paris Agreement maintains elements that we value, including maintaining the integrity of the currently agreed-upon rules.

Secondly, states and cities do not have the capacity to help prepare our strategic partners abroad for climate risks threatening their safety which, in turn, threatens the American people.

Make no mistake -- climate-related security risks are
happening right now and they are getting worse. This conclusion was unequivocal in last month's worldwide threat assessment of the U.S. intelligence community.

Third, states and cities can't put sufficient pressure on larger countries to embrace climate smart foreign development. Take, for example, China's massive Belt and Road infrastructure project worth $6 trillion that include 70 countries on three continents.

It is, roughly, 46 times as large as the Marshall Plan. Despite their domestic progress at home, from 2014 to 2017 93 percent of energy investments by China's Silk Road Fund and 95 percent of foreign energy investment by China's state-owned enterprises were in fossil fuels.

The U.S. is not challenging China, given President Trump's commitment to fossil fuels. No other countries can exert pressure on China. This gap requires federal reengagement in Paris and in broader international climate efforts.

Let me close with a few suggestions to what Congress can do to get the U.S. back into the international climate arena. First, pass a resolution to support the Paris Agreement that also explicitly supports current subnational action.

Second, double funding for clean energy and carbon removal
RD&D to catch up with China and make sure the money that you have allocated is being spent.

And finally, for fiscal year 2019 you increase bilateral environmental assistance to $776 million from $400 million. These funds should be spent to help prepare countries for climate change so that we can work together to create a safer and more resilient world.

Thank you. I look forward to your questions.

[The prepared statement of Mr. Light follows:]

***********INSERT 4***********

Mr. Tonko. Thank you, Mr. Light.

We now have concluded with opening statements and now move to member questions. Each member will have five minutes to ask questions of our witnesses and I will start by recognizing myself for five minutes.

Many of my colleagues will want to discuss subnational commitments but I would like to start with some basics of the agreement.

Dr. Light, I just want to clearly state what I believe I heard you say in your -- in your just-delivered statement. Do you agree that the United States and all other parties to the
Mr. Tonko. So with that being said, when President Trump talks about imposing draconian burdens on our country, is that a fair criticism of the agreement itself?

Mr. Light. It is absolutely false, sir. I was at the table when the agreement was being negotiated. There were no draconian burdens that were put on the United States or any other country.

Mr. Tonko. So then this is not a U.N. mandate that undermines our sovereignty?

Mr. Light. Not at all.

Mr. Tonko. Our mitigation commitment was submitted based on existing and planned United States policy. Is that correct?

Mr. Light. Yes, sir.

Mr. Tonko. And, Dr. Light, one of the biggest achievements of the agreement is the inclusion of large developing nations such as China and India. Can you explain their commitments and how they were brought to the table?

Mr. Light. Well, I think I sort of gave you a little bit of an overview of what China and India are doing right now and we can talk about, you know, what's going on in terms of emissions recently with those countries and the United States.
But how they were brought to the table was a very interesting story. The United States and China had historically been the biggest adversaries in this process.

So if you go back decades to the original creation of the framework convention in 1992, it was just an incredible fight between large blocks of countries, mostly developed countries on the one side, developing countries on the other side.

The developing countries said, you caused the problem, essentially applying a kind of "polluter pays" mentality. It is your responsibility to solve it. We shouldn't be required to do anything.

But that is just not viable, as Representative Walden said. You can't reduce emissions sufficiently only on the backs of developed countries because the bulk of emissions now are from developing countries. We tried with different measures to move forward on this. But we could never get sufficient participation from these other countries to move forward.

The Kyoto Protocol, for example, only had the participation in terms of obligations to reduce emissions from less than 20 percent of emissions globally from the countries that had to reduce their emissions.

The Paris Agreement -- the countries that are committed to
the Paris Agreement now, until the U.S. leaves, covers 96 percent of global emissions. We worked with China behind the scenes for over a year to make sure that we could bring them to the table, that we would only stand next to them, as President Obama did in November of 2014, with President Xi in Beijing -- we would only stand with them and while they were announcing the top lines of their target if we thought their target was respectable, and they did the same with us. And that created a race to the top that brought countries along.

India is another story. Prime Minister Modi has long been a climate champion, and what we did is we took -- looked at his domestic desire to try to move his country forward on a more sustainable path. By himself he increased his own renewable energy targets and then we worked with the Indian government to make sure that their platform could be used to advance other research and innovation programs that they wanted to create.

Mr. Tonko. Thank you for highlighting that.

Because these countries are in a different stage in their development their time line may be longer than ours. But it is clear that they are committed to taking action and pursuing more sustainable development.

How is China working forward? Are they still on track to
peak with its emissions around 2030?

Mr. Light. That -- no, sir. I believe they are actually going to peak quite earlier than that. I mean, all estimate evidence to date is that they will peak earlier.

They did have a 3 percent uptick in their emissions as far as we can tell in 2018. The U.S. emissions also went up 3.4 percent in the same time period.

But there is lots of explanations for this having to do with some stimulus in the Chinese economy -- for example, a huge boom in construction to try to create more apartments for people, which are -- 20 percent of them are actually going empty right now.

So there have been things like that that have moved along. But if you look at the scale of Chinese emissions, it really precipitously goes down as we get closer to the creation of the Paris Agreement because that is when international pressure is there. That is when the Chinese are starting to recognize that they have a geopolitical advantage by becoming leaders on this issue. The small countries -- small island states -- are just as worried about China as they are worried about the emissions coming from the United States. All those emissions are going to cause sea level rise. They are going to harm them.
And so what we have seen is the Chinese respond to that. But, as I said at the end of my testimony, there is a worry here that the Chinese could still move forward with respect to building out coal facilities in other countries unless someone tries to pull them back to the table. No other country can do that other than the United States.

Mr. Tonko. Thank you.

Are there any other common misconceptions about the agreement that you would like to clarify in a relative few questions?

Mr. Light. Sure. One thing, and that is this. I have heard -- I understand the criticism that the current pledges under the Paris Agreement -- right now that parties are behind. They don't -- aren't sufficient to meet the 2 degrees Celsius goal, let alone the goal of the agreement to try to even get lower -- get lower temperature response like 1.5 degrees.

We have to keep in mind that Paris was created as a process. It is not just one shot, you make your pledge, and we are done and we see how good we do.

It sets up a process so that parties have to come back to the table at regular intervals to make regular new commitments of increased ambition. That is going to be what is going to help
us to close the gap that some of you have articulated in your opening statements.

Mr. Tonko. Thank you. Thank you, Dr. Light.

I now recognize Leader Shimkus for five minutes to ask questions.

Mr. Shimkus. Thank you, Mr. Chairman. Thank you all for being here.

Mr. Light, I appreciate your passion and, Mr. Hultman, I am a believer in subnational activities. We are federalists, especially on this side, and we believe in local control, local government, and we want to keep encouraging those who want to go in a direction.

But let me ask this question. What is -- first of all, kind of -- it can be a short response -- what is more binding, a treaty or an agreement?

Ms. Frisch?

A treaty. Constitutionally, it is really, there's no --

Mr. Thernstrom?

Mr. Thernstrom. A treaty.

Mr. Shimkus. Treaty.

Mr. Hultman?

Mr. Hultman. Both a treaty and agreement have authority
under international law and the Paris Agreement is something that we can use to accomplish the goals --

Mr. Shimkus. Okay. But for us and our Constitution and our government, which is more binding? Which has political buy-in? Which is vetted by the legislative branch?

Mr. Hultman. The Paris Agreement was formulated under the U.N. Framework Convention on Climate Change, which is --

Mr. Shimkus. Okay. Let me -- I just taught high school government and history. I mean, I don't profess to be an expert on the Constitution but only a treaty gets voted on by the legislative branch, and not even the House -- the Senate.

Mr. Light, would you agree with that?

Mr. Light. That is true, sir. But --

Mr. Shimkus. Well, let me ask --

(Simultaneous speaking.)

Mr. Light. -- depends on --

(Simultaneous speaking.)

Mr. Shimkus. Let me ask you this question. Let me just ask -- let me ask you this question. Why didn't the Obama administration submit this as a treaty?

Mr. Light. Because it was not a treaty. Because it was an agreement under the treaty that we had already agreed to that
passed with unanimous support in the Senate, Republicans and Democrats -- the U.N. Framework Convention on Climate Change.

This was an agreement under that treaty that the Senate had already -- had already ratified.

Mr. Shimkus. So, Mr. Thernstrom -- so, Mr. Thernstrom, you heard -- in your testimony you highlight the need for a national buy-in, and maybe through the subnational groups you are going to build that consensus and we may be there.

There was actual shifting since this last time we had this debate and I think you can hear that on our side. Why is it important for this decision to be vetted by a legislative body?

Mr. Thernstrom. As other witnesses have testified today, the subnational actors certainly can take action in many respects but they have also all called upon the federal government to use its resources, which are much greater than those of subnational actors in a coordinated fashion and, obviously, we lack a political consensus in this country, which -- to produce a federal policy on clean energy innovation and climate-related emissions.

And so if we could reach that consensus, and I think this committee is obviously the place to have that conversation, I think everyone at the table here would agree that federal action -- I think that is what I have heard from all witnesses is that
federal action could be much more effective than the state and local action and it is, obviously, that political process that you are speaking of that would enable coordinated and ambitious federal action and I hope that we can get there.

Mr. Shimkus. And we have this fight and this debate in our committee all the time. Can a federal agency do this? Do they need more legislative language? How do you impart it? How do you have the force of law?

So other than going through the legislative process and binding us to the votes that we cast, we are going to be whipsawed back and forth by administrations here and there and we will not have a consistent national policy for the decades. And I think -- I think we all agree.

I mean, if you look at the Climate Action Tracker, which I used in my opening statement, even going to the Paris Accords now you are plateauing.

Talk about -- and my time is almost out so I only have a minute left -- Mr. Thernstrom, done poorly with all the different aspects of energy use in this country, how could that affect jobs and the economy and the cost?

Mr. Thernstrom. As my testimony, especially my written testimony, indicates, I think climate protection is a very
important value for myself and for many Americans, most Americans
even.

But I think balancing climate concerns with the other values
in this space such as protecting, you know, affordable energy
sources for consumers is critical both to achieving the political
consensus that we have been calling for in this exchange but also
for the technologies to actually reach the level of economic
competitiveness that would allow them to scale successfully into
global markets and be used in developing nations.

So I think keeping costs of clean low is crucial to both
political consensus, to durability of policy over the years, as
you suggest, and to acceptance within the global marketplace,
which is key to environmental performance.

Mr. Shimkus. My time has expired. Thank you, Mr. Chairman.

Mr. Tonko. Thank you, Mr. Shimkus.

The House has called for at least three votes. The time
estimate for that is about 40 minutes. So what we are going to
do is move to Chairman Pallone for his questioning for five
minutes. Then we will take a recess to go vote and we will come
back after that, 15 minutes after the last vote is called.

So Chairman Pallone?

The Chairman. Thank you. I had some questions to ask Mr.
Hultman but Mr. Shimkus keeps making me veer from my questions. I just think this --

Mr. Shimkus. It is working.

The Chairman. I don't mean to be so critical, Mr. Thernstrom, but I just -- this whole argument about treaties versus agreements, look, the bottom line is it is very obvious that the Paris Agreement sets up, as I think Mr. Light said, essentially a voluntary process where the, you know, parties are going to meet from time to time to see what they can accomplish and, you know, I don't -- I don't understand why in the world the president felt it was necessary or suggesting to withdraw to this process that is, you know, essentially voluntary and, you know, my point is that President Trump is the outlier here.

I haven't heard anyone on the Republican side -- maybe I shouldn't bring it up but I haven't heard any of them say they think we should have withdrawn from the Paris Agreement.

To me, Trump is the outlier. He just wants to send a signal that somehow we are not going to be part of this and move in the opposite direction on climate change, which is probably contrary to almost everybody in this room, regardless of being a Democrat
or Republican.

I mean, even his own daughter I remember at the time was, like, you know, pleading with him, don't withdraw -- this is a voluntary agreement. I mean, I don't even know if anybody in the White House agreed with him. Certainly, his family didn't.

So, you know, all this discussion about, you know, treaties versus agreements I just -- I just think it's, you know, largely irrelevant. I don't mean to be disrespectful but I just think that he was trying to send a signal that I am not going to move on climate change -- I don't believe that climate change is an issue and I am going to try to kill everything we have done under Obama to lead in that direction.

And he is an outlier. We should just recognize. Unfortunately, he is the president. Let me ask Mr. Hultman, you know, it is interesting that it is almost the opposite. You know, Mr. Shimkus talked about, you know, France and other countries that, you know, where the leaders are trying to move forward and they are getting resistance.

I almost feel, based on what Ms. Frisch said, it is the opposite here. Our leader is trying to move backward and the business community and the grassroots are saying, no, don't do that. It is sort of interesting in a way.
But what I wanted to ask you, Mr. Hultman, is this whole issue with the -- you know, with -- well, you call them the subnational or non-federal actors. What is it that we can do to make it easier for these subnational actors to take meaningful action and live up to our Paris commitments? You sort of suggested that they are -- at some point they are going to have their own limitations.

Is there something we could do maybe on a bipartisan basis to make it easier for them to continue in that vein? Or what kind of challenges will they face because of federal inaction?

Mr. Hultman. There are -- there are a few things that I think can be done now at the federal level and let me just pick up on your previous comment that, yes, we are seeing this leadership and I think this actually is an element that ties together some of the comments that we have heard today from you all, that we are building through this substantial, you know, set of leadership across party lines in some cases some ideas and some strategies for reducing emissions. We are --

The Chairman. By the way, I don't have -- I have a lot of Republican mayors and county legislators. There isn't a single one of them that agrees with the president on Paris. Not one.

Mr. Hultman. And in many cases, as Carla also mentioned,
that a lot of these actors are doing these in response to demands
from their constituencies and being responsive and trying to lead
in the ways that they see being valuable for their -- for their
organizations, for their jurisdictions.

So we are seeing what I would argue we had to do anyway in
this country. We had to anyway leverage all of these levels of
government, leverage all of the leadership.

Think about what is going to work and not work in our various
kinds of situations and build from the ground up a strategy that
we can use then, stitched together at the federal level.

The Chairman. Is there anything -- because we are going
to run out of time --

Mr. Hultman. Yes.

The Chairman. -- is there anything that we can do to make
it easier for them or challenges they are going to face because
of what we -- -

Mr. Hultman. I think it is important to make sure that those
states and cities which want to be leading and out ahead that
from the federal level we allow them to do so. I think that is
sort of first and foremost -- do no harm. I would highlight the
state of California in particular, which is trying to move forward
on some of its regulatory actions.
Also, to make sure that we are as somebody -- I think Andrew mentioned -- spending out the funds that have been allocated to those jurisdictions -- for example, weatherization efficiency. That is helpful for low-income people, it is helpful for building the basis for future reductions.

The Chairman. I know we are running out of time but, Mr. Chairman, is there something Mr. Light wanted to say?

Mr. Light. Thank you, sir. I just wanted to go back to one thing you said at the top on the voluntary nature of the Paris Agreement. Absolutely correct.

It is important to remember, though, that the rules on transparency, on accountability, those are binding.

The Chairman. Okay.

Mr. Light. That is the interesting combination we set here. This is why this is not just a vacuous agreement and it doesn't have force like a treaty.

Now, you know, Mr. Thernstrom said that innovation is the key and treaties are not as important. I agree innovation is totally important. But the important thing is that we need to know whether other countries are actually fulfilling the pledges that they are making publicly.

The only way we know that is if we actually have the rules
that we have agreed to under Paris that put developing and
developed countries on the same terrain of accountability.

Mr. Tonko. So we need to go vote. We will stand in recess
and return 15 minutes after the last vote is called.

With that, we are in recess.

[Recess.]

Mr. Tonko. We have our witnesses back at the table. We
have our next member who chooses to question the witnesses here.
So I call the subcommittee back to order.

And now we will recognize the Republican leader of the full
committee, Mr. Walden, for five minutes.

Mr. Walden. Thank you, Mr. Chairman. Thank you, Mr.
Chairman.

Mr. Tonko. You are welcome.

Mr. Walden. And thanks to our witnesses for returning.

Sorry. When we have these votes on the floor they are just part
of our constitutional responsibility as well.

So there has been some discussion this morning, I know, about
treaties versus agreements in the context of the Paris Accords
and Mr. Thernstrom stated in his written testimony, and I agree
and I quote, "The Paris Agreement could not succeed since the
agreement was a substitute for rather than the product of a
domestic political consensus," which I think is a really important point.

The role of the Congress should not be circumvented in addressing such sweeping policies that impact so many aspects of our daily lives, from our utility bills to what we pay at the pump to the livelihoods of American citizens.

And that is what I hope and I trust with our chairman that we will be able to build here as a consensus -- bipartisan consensus. That is how big things get done. This is a big thing that needs to get done.

Mr. Thernstrom, last November, Bill Gates was quoted at a Stanford Precourt Institute for Energy event as saying, and I quote, "The climate is easy to solve group is our biggest problem. The climate is easy to solve group is our biggest problem."

He said this in context of people who assume that we have the current tools to address climate change and should be able to do so rather easily.

Do you agree that this is not an easy problem to solve -- that we do not currently have all the technologies needed to solve it?

Mr. Thernstrom. I very strongly agree with that, Mr. Walden, and I think that the -- consequently, as I said in my
statement earlier, I think the core focus of federal policy should be on driving energy technology innovation.

I do think that, obviously, as I said, we have made great improvements --

Mr. Walden. Right.

Mr. Thernstrom. -- in performance of clean energy technologies. Prices are coming down and we see that in the marketplace. There is a lot of adoption of those technologies, as many witnesses here has testified. So I celebrate those accomplishments.

But, clearly, if the technology was where we needed it to be today --

Mr. Walden. We would be done.

Mr. Thernstrom. -- we would be done. We wouldn't need policy. And so I think all of the analysis that I have seen suggests that we can make improvements today but to get to where we need to be in the energy sector we need significant innovation.

And even the utilities that I am aware of that are most forward leaning on this -- that have made the most ambitious commitments to action all understand that this question is not just about using today's technologies. It is about getting to
better ones and there is an important role for public policy in
that as well as for the private sector.

Mr. Walden. I was in a meeting yesterday with some leaders
from one of the world's largest oil companies and I asked them
the same sort of question about innovation in their space,
especially as it relates to methane capture and carbon capture
and sequestration.

And they started to tell me about some of the cutting-edge
technologies they are investing in to see what they can get done
and that is where I think, as Americans, we are unique in the
construct that we believe in -- the entrepreneurial spirit.

We believe in that innovation. We believe in that a couple
of guys in a garage in San Jose that do some weird stuff and end
up with a company named Apple or, in my context, a guy with a
waffle iron that developed a little shoe we know now as Nike.

You know, and I have great confidence we can do that here,
and from a positive standpoint. In fact, the study you submitted
in your testimony says that a bet exclusively on today's apparent
winners -- solar, wind, and battery storage -- should be a mistake.

Why do you think that?

Mr. Thernstrom. So the point of that -- the point of that
study is to say that we can see -- as I have said, I applaud the
success of renewable energy technologies in improving their performance in recent years.

Mr. Walden. Right.

Mr. Thernstrom. But if you think about the question of how you get to a clean energy system as a whole -- not just to have some incremental progress -- all the analyses that I have seen agree that having a diverse mix of fuel sources within the energy system is really crucial to getting to -- to maintaining low cost as we reach for higher levels of decarbonization. So --

Mr. Walden. And should advanced nuclear be part of that mix? Does it have to be?

Mr. Thernstrom. Absolutely. My organization is a strong believer in investing in the full portfolio of technologies, very much believe that advanced nuclear is part of that, advanced carbon capture as well and many renewable technologies. So we see value, as I say, in that full portfolio.

Mr. Walden. And, I assume, hydropower?

Mr. Thernstrom. Absolutely.

Mr. Walden. We have studies from our own agencies saying we can increase hydropower dramatically. Now, there are some price points here, too. It is one thing to say you can do it. It is another to say the market would accept that higher price
in some of these facilities. But we know that is carbon neutral.

Mr. Thernstrom. That is correct, sir. I know some advocates are working very hard on figuring out how we can get more productivity out of our existing hydropower resources and things like that and I certainly applaud those efforts.

Mr. Walden. My time is expiring. I know we have focused kind of on energy in this discussion. We need to do this on manufacturing, what we can do to capture carbon. I have heard of technologies that are being developed where you could sort of drop powder in and -- elementary level here -- and it would surround the molecules and pull it out, the carbon is taken out. It would be fascinating to be able to get in that discussion.

If we are going to add all these electric vehicles -- I drive a hybrid on both coasts -- but, you know, that is going to be a drain on the energy grid but it can also be a big storage battery. I mean, I have heard of that discussion.

So anyway, I appreciate all our witnesses here today. Sorry I have to come and go but, Mr. Chairman, thank you for your indulgence and I yield back.

Mr. Tonko. Okay. The gentleman yields back, and can I just please encourage the witnesses to speak into the mic so that we can all record well and hear well.
So with that, the chair now recognizes the gentleman from Virginia, Mr. McEachin, for five minutes.

Mr. McEachin. Thank you, Mr. Chairman, and let me begin by thanking you for calling this hearing and all of our witnesses for sharing your expertise.

I also want to acknowledge my friends and constituents back home who have worked hard to show that whatever the Trump administration may say or do about the Paris Agreement, Virginia is still in.

I know many others up here can say the same things about their communities, their citizens and their friends back home.

Part of our job is to ensure that those folks are not alone, to give them a federal government that supports and further builds on their work instead of ignoring it or trying to thwart it.

I have tried to do my part. In the last Congress, I was proud to introduce a bill that would have forced the Trump administration to acknowledge over and over that the U.S. withdrawal from the Paris Agreement is disastrously out of step with the choice that all of our partners and allies around the world are making.

So I think this hearing is a very important step and I hope it helps to lay the groundwork for some of the concrete policy
changes we desperately need.

And with that, Mr. Light, I would like to ask you the following. Some of my friends across the aisle oppose aggressive climate action because they say the challenges we face are bigger than our one country -- we cannot solve them alone.

I actually agree with that point. Other countries need to pull their weight. But the outcome -- collective action -- is exactly what the Paris Agreement was meant to achieve.

Can you explain how the imperative to influence other countries makes climate action at the federal level an absolute necessity?

Mr. Light. Thank you, Representative McEachin, and I just want to say I appreciate your leadership on the Paris climate act on transportation and a host of other issues for helping the country and helping the district and state.

I think that the -- you know, that one of the things that has been coming out here, and Representative Walden just mentioned it, is this -- sort of this idea that we shouldn't have moved forward with Paris because there wasn't a bill that came out of Congress to support the U.S. position.

And I think that this is wrong for a number of reasons that you have just touched on.
So, first of all, President Obama did ask the Congress at least three times in State of the Union speeches to bring forward legislation so that he would have a commitment that he could use to take and build a commitment under Paris.

We didn't get a bill come out of Congress. But climate change is moving on. The urgency was still there. The United States had to act. The United States can't solve the problem alone.

But we are not going to be able to get the buy-in from other countries unless the United States is there to move them along, and I gave several examples of that in my testimony.

Secondly, we are losing the competitiveness race to China and other countries. If you just take -- the ISC had a study that just looked at the pledges from developing countries alone under Paris. That created a $23 trillion market in transformations, in energy, and infrastructure abroad.

The United States has to compete with that and if we are not part of Paris, if we are not part of these coalitions, we are going to lose the race and other countries are going to gobble up those markets and gobble up the jobs from that.

And so that is where you need the United States there to cooperate and bring other countries along and also not to suffer by appearing to be dragging everyone behind, which is what we
Mr. McEachin. Thank you for that.

Ms. Frisch, did I say that close? Okay. You know, we always talk about the states are laboratories for democracies -- for democracy. And you have stated that states with commitments to climate have reduced their greenhouse emissions faster than the rest of the country while growing their economies.

What have the last two years taught us about the economic feasibility of large-scale action.

Ms. Frisch. And thank you for that question.

The initial states in the U.S. Climate Alliance not only found that they were able to reduce their emissions faster than the rest of the country but their economies grew faster than the rest of the country. They are making commitments to reduce emissions that also have all kinds of co-benefits like jobs and technology.

And on the technology front, you mentioned the costs coming down. We have seen that trend just continue to go and go, and even one of the leaders of the second largest utility in the U.S. said recently that by the early 2020s, which is not that far from now, renewables plus storage -- building that new will be cheaper than continuing to operate existing coal and existing nuclear.
So we have seen that trend over the past years and can look forward to that in the future.

Mr. McEachin. Thank you.

Mr. Hultman, I am sorry. I just have a little bit of time left. But can you explain what you mean when you say why the experiences of state and local actors have actually helped ease the way for systematic federal action?

Mr. Hultman. Sure, and very briefly, federal action can fill in some of the gaps where city, state, and business action can't, and we have a federal system. There is different policy levers that each level of government has.

What those city, states, and businesses are doing today is, first of all, building out more efficiency and more renewables in their contexts. That allows the federal government to take that and build on it and, similarly, it helps drive down costs of those technologies.

Mr. McEachin. Thank you. Thank you, Mr. Chairman. I yield back.

Mr. Tonko. The gentleman yields back.

The chair now recognizes the gentlelady from Washington State. Representative McMorris Rodgers is recognized for five
Thank you, Mr. Chairman, and thank you, Ranking Member. I appreciate everyone being here and sharing your thoughts on the issues impacting our environment.

Clearly, the climate is changing and global industrial activity is a contributing factor. I believe that we must play a role in reducing carbon emissions and being good stewards of our natural resources. Part of why I have fought for the advancement of clean energy resources like hydropower, nuclear energy, biomass, hydrogen fuel cells.

It is also why I have long advocated for active forest management and reforms that we need to reduce the risk of catastrophic fires like the ones that we experience regularly in the West, and these decimate our carbon-capturing forests and emit toxic smoke into the atmosphere.

I believe that these and other realistic market-based solutions that incentivize use and investment in clean energy resources are the answer, not the big government proposals that harm our economy and force the American people to bear unreasonable burdens.

Mr. Thernstrom, as you may know, I am a strong proponent of hydropower as a piece of the comprehensive clean energy program.
that we need. My home state of Washington is a large producer of clean renewable reliable hydropower and I have supported efforts to advance this clean energy both nationally and internationally, I believe, that we should be doing.

With the role that Washington State plays in hydropower energy production and the overall role that hydropower plays in the United States, I just wanted to get your thoughts on how hydropower can grow as a power resource on the international level.

You note in your papers that there may be geological limits to current expansion of hydropower but you see promising technological advances that would increase its usefulness as a clean baseload power source.

I just wanted you to discuss that a little bit further and also hear what you think the United States needs to do to remain a prominent player in the hydropower arena internationally.

Mr. Thernstrom. Thank you very much for that question, Congresswoman, and I should say at first that I don't actually consider myself an expert on hydropower. So take my answers for what they are worth. I study it in the context of innovation and clean energy technologies, broadly.

I do believe that hydropower has a very important role to
play in this, particularly because it is a renewable resource -- energy resource -- that is also firm, that it is dispatchable mostly when you need it.

Obviously, weather conditions can affect the state -- the status of reservoirs and dams and therefore the ability to dispatch that power indefinitely.

But, fundamentally, hydropower can be considered a firm resource and therefore plays a crucial role in a reliable low-cost clean energy system. So I applaud the role of hydropower.

The question is, of course, how much more can we get out of our hydropower resources. There are limitations on the geography for where new hydropower can be developed and, obviously, there is questions of community opposition in some places.

I know many environmental advocates are interested in how we can get more power out of existing resources that we have, so without building new dams, repower those and get more productivity out of that and I certainly think that is a very strong place to start with that question.

Mrs. McMorris Rodgers. Thank you. You may be aware that last year this committee passed legislation to expedite the two-year licensing process for pumped storage hydropower. As
we are focusing on innovation I think we should also be focusing on identifying the regulatory barriers to implementing advanced technologies. What role do you see regulatory reform playing in serving our efforts to speed up clean technology deployment?

Mr. Thernstrom. Again, thank you for that excellent question. I do think that there are many instances in the hydropower space and within -- with many of these other technologies where existing regulatory structures are an impediment to the adoption and rapid use of these technologies -- that we can make them -- we can make it easier for businesses, for utilities, for states that want to be leaders on this to actually move forward with that by looking at the regulatory barriers that we have now.

I applaud that hydro bill. I think we see similar efforts in other areas with other technologies to try to make it easier to build advanced nuclear reactors, to test new fuel cycles, to build carbon capture, to move carbon dioxide through pipelines and inject it underground.

Across the suite of technologies we see there are regulatory barriers to the adoption of clean energy that I think this Congress should be looking at and trying to lower in every instance.

Mrs. McMorris Rodgers. Yes. Only 3 percent of the dams
actually produce hydroelectricity in America, and we could double that without building a new dam. But, unfortunately, it takes 10 years on average to relicense one of those dams. So there is more to be done.

Thank you very much.

Mr. Thernstrom. Thank you.

Mr. Tonko. The gentlelady yields back.

The chair now recognizes the gentleman from California, Representative McNerney, for five minutes.

Mr. McNerney. I want to thank the chair and I thank the witnesses this morning.

Mr. Light, Mr. Latta, my colleague, and I co-chair the Grid Innovation Caucus and I am committed to modernizing the grid to keep up with the demands that the electoral system is going to be seeing in the future.

What do you think needs to be done to educate the ratepayers and the PUCs and the policymakers and the consumers about having utilities adopt this technology?

Mr. Light. Well, I think this is an excellent example of where -- again, I am all in favor of doing work on RD&D, on innovative technologies, on battery storage, on, you know, small nuclear.
We need to -- this is an all of the above -- all forms of clean energy have to be deployed to meet these larger targets. That is an excellent example of where we have got a problem right now that we solve. We can't move forward on those until we do grid modernization.

Mr. McNerney. And we have to educate the different stakeholders.

Mr. Light. And we have -- and we are going to have to --

Exactly. We have to educate the stakeholders that there is a market out there to be had. This transition is better for them. It avoids longer-term risks.

It also, at the end of the day, will lower their electricity rates and this requires programs out there -- not draconian regulations of any sort but programs out there that help people to understand the opportunities before them.

Mr. McNerney. And investments as well.

Mr. Thernstrom, thanks for coming in this morning. And I appreciate your comments about the need for innovation.

What federal policy do you -- what federal policy do we need to encourage the adoption or -- and acceleration of clean energy technology? What federal policies are we going to need?

Mr. Thernstrom. Well, obviously, there isn't a simple
answer to that question. It is a complex range of things. As you know from our previous conversations, sir, I believe in a mix of policies that could be knitted together in one coherent package.

But, broadly speaking, I think it is important to have technology push -- that is, investments in innovation in the full suite of technology spaces -- renewables, efficiency, carbon capture, nuclear, hydro.

Across the board we need to invest in advancing those technologies. I do think in the long run there needs to be demand pull as well. We need to know what the rules of the road are going to be in the power sector.

We have a state of flux, let us say, in what the regulatory requirements will be and I think this committee is the place to think about what the long-term rules of the road will be for the power -- -

Mr. McNerney. It sounds like you are advocating for consistent long-term policy.

Mr. Thernstrom. That is right. I do think --

Mr. McNerney. And I think everybody here would agree with that. So --

Mr. Thernstrom. I think that is crucial that --
Mr. McNerney. But, I mean, the problem is getting a bipartisan agreement on that. So it is going to take pain on both sides if we are going to get there.

And we are -- okay. Enough said.

Mr. Thernstrom. Well, I agree with you on that point, sir.

Mr. McNerney. Mr. Hultman, I am working on legislation to improve our understanding of stratospheric composition and aerosol interactions.

Now, would this research be helpful in establishing a baseline of current conditions that is needed before any NGO engineering deployment could be considered?

Mr. Hultman. Thank you for the question, and I want to distinguish two pieces of this question.

One is that on the broad science of climate change we definitely know enough to take actions today of the kind we have been talking about I think that are being taken both at the subnational level and maybe bringing some of those ideas to the federal.

That said, there are some significant uncertainties about how human interference or human contribution to a geoengineering approach to climate change would actually work, and this was highlighted in the National Research Council report of a couple
of years ago that really called for some necessary investments
in understanding the scientific elements of a geoengineering
strategy. So the short answer is yes.

Mr. McNerney. Well, that was the only answer.

Thanks. Anybody can answer this one. In order to address
climate change we are going to have to move rapidly in reducing
our carbon emissions and removing carbon from the atmosphere.

What are the most promising technologies right now that we
have out there to do that? Whoever wants to take that question.

Ms. Frisch. I think the most promising technologies that
we have out there are the ones that can help prevent emitting
that carbon dioxide into the atmosphere in the first place.

So those are ready to go and being deployed in those spaces.

But as the other panellists have said, we have to bring every
single technology to bear on the solution -- to bear on this
problem to be able to get on track and reduce emissions as quickly
as we need to.

Mr. McNerney. I saw an article -- I think it was in the
New York Times -- about a promising technology in Switzerland
to remove carbon cheaply. I mean, there must be some really good
technology out there that we need to look into and encourage.

Ms. Frisch. Right. I read that article, too, and I think
the key there was that it is in the R&D phases and the costs need
to come down. So we should definitely be encouraging that while
we are deploying the technology that we already have.

Mr. McNerney. Right.

Mr. Thernstrom. If I may, I would just agree with Ms. Frisch
that I think halting emissions from existing sources first and
developing, say, carbon capture technologies that would
facilitate the development of carbon removal in the long term,
that is the pathway we need to take.

Mr. McNerney. All right. Thank you.

Mr. Chairman, I yield back.

Mr. Tonko. The gentleman yields back.

The chair now recognizes the gentleman from West Virginia,
Representative McKinley, for five minutes.

Mr. McKinley. Thank you, Mr. Chairman.

And this subject is long overdue to having a conversation
on this because there -- obviously, there are storm clouds on
the horizon.

Around the world there is still a voracious appetite for
the use of fossil fuels and they are predicted by the next few
years that the global increase -- its consumption of fossil fuels
by up to 16 percent.
So the idea of how we are going to deal with that issue is complex. America could very well lead the way and we have in decarbonizing and lowering our emissions -- CO2 emissions down to 16, 18 percent by some standards. But yet China and India have markedly a continued increase. So what is it, the number of -- China is up 290 percent in this decade, and India 235 percent.

So the thing that I am perplexed about is that we can go about -- American continuing to lead and make our reductions where -- again, up to 20 percent. We have already begun complying with the Kyoto and the Paris Accord by making reductions. But the rest of the world isn't, and so as a result, we are going to be the ones that suffer with this. We are still going to see the oceans rise, temperatures again increase.

Miami is going to be under water and all that -- we have done everything. We have complied totally with it. We have already begun complying with the Kyoto and the Paris Accord by making reductions. But the rest of the world isn't, and so as a result, we are going to be the ones that suffer with this. We are still going to see the oceans rise, temperatures again increase.

But the rest of the world isn't, and so as a result, we are going to be the ones that suffer with this. We are still going to see the oceans rise, temperatures again increase. So the thing that I am perplexed about is that we can go about -- American continuing to lead and make our reductions where -- again, up to 20 percent. We have already begun complying with the Kyoto and the Paris Accord by making reductions. But the rest of the world isn't, and so as a result, we are going to be the ones that suffer with this. We are still going to see the oceans rise, temperatures again increase.
now. 1717

So the fact that, Mr. Thernstrom, we have been working 1718
together, quite frankly, so with all disclosure here to try to 1719
figure out what is a solution to give -- empower these other 1720
countries to implement something that is cost effective and 1721
because if we don't and they continue to burn fossil fuels, we 1722
are still going to have a water problem. 1723

We are still going to have droughts. We are still going 1724
to have severe weather all around the globe. Maybe not in America 1725
but around the world is going to suffer. 1726

So I think if we -- if the primary cause is how we capture 1727
carbon, I think we need to have the innovation and we have to 1728
move it up first. Do the innovation first. 1729

Show that what the technology, and then we can export it 1730
to the rest of the world and make it so that it is affordable 1731
for them to do it because they are still going to use carbon. 1732

We -- I think we have the responsibility to lead the way 1733
in doing this. But let us make sure that we don't put the reverse 1734
in -- we don't put a hammer approach. Let us use the innovation 1735
first and then go to implement the policies then to follow back 1736
with that. 1737

So if they don't have the -- Mr. Thernstrom, if we don't
have the technology yet, what are you suggesting? What now --
what could we do? I know last year we passed 45Q to be able --
that was a major step to show how we might be able to do that
to develop that in carbon capture.

What are -- what are some of the thoughts that you would
have how we might do the innovation first? Unfortunately, we
lost one of our members here that I know has an interest in
innovation.

But give me a little bit more on your spin.

Mr. Thernstrom. Thank you, sir, and thank you for your
leadership on this question. I guess I would start my answer
to that question by you ended, with 45Q as an example of both
what I think can be done that is constructively but also what
more needs to be done.

So full disclosure, I was up here advocating for 45Q passage
for almost more years that I can remember -- I think it was seven
or eight. I think 45Q was a very important step forward.

At the same time, we are actually seeing very few projects
are being built so far because of 45Q, although I still have high
hopes that more will come.

The reason for that is that 45Q is one lever within a very
complex energy system. And so what I keep saying to you and others
is that if we want big outcomes from big energy systems we need big inputs.

And that is why I think it is important for the members of this committee to come together around some consensus about what policy proposals would be.

As you know, another theme of mine is that the innovation needs of different technology families are distinct. So my answer to you is what we need to do for fossil decarbonization is different than what we need to do to advance nuclear and that is different from what we need to do for solar.

And I would encourage you and other members of this committee to look at the specific needs of those technologies, have policy responses that are tailored to them but which are comprehensive and ambitious rather than just these one-off small ball type approaches. That is how we will get to big outcomes in the energy system that we all --

Mr. McNerney. Thank you. My time has expired. I yield back.

Mr. Tonko. The gentleman yields back.

The chair now recognizes the gentlelady from the state of Delaware, Representative Blunt Rochester, for five minutes.

Ms. Blunt Rochester. Thank you, Mr. Chairman, and thank
you so much to the panel.

I am very happy to be joining you here at this hearing because as I jumped out of the room for a minute I had to meet with students, our Delaware Civil Air Patrol Cadets, and I thought about the significance of this conversation and how important it is not just to my state and our country but to the planet.

And I want to start by saying I am pleased to say that my home state of Delaware wasted no time joining the U.S. Climate Alliance and I believe it is encouraging to see so many local governments and communities stepping up to act on climate change.

Local officials are on the front lines of protecting our communities. But they need that federal support. And I am concerned that a piecemeal approach may create an uneven playing field where some communities may take meaningful steps and look out for their most disadvantaged citizens while others may not.

And, as you know, climate change is already affecting communities across the United States and those communities will only intensify over time.

So I would love it if you could talk a little bit, Mr. Hultman and Ms. Frisch, have you seen any successful examples of local climate action addressing the unique challenges faced by disadvantaged communities? And what lessons can be learned at
the federal level from those case studies, again, examples of local climate action in disadvantaged communities?

Mr. Hultman. So I will give two quick examples, and I think Ms. Frisch probably has some others because she has been working in -- across different kinds of technologies in this space.

But, very briefly, there are two areas that I would look at and this does tap into our conversation about the simultaneity of deploying new technology but also doing innovation with, you know, as necessary.

A third thing that we can imagine as part of that is jobs and economy, and I think that, for example, there has been a lot of new work, as we are talking about students and sort of new training, in looking at, for example, solar and wind installers, right. Like, that is an area where you can, with some technical training, you know, people can actually learn the toolkit.

They can take sort of construction skills and apply it and be able to move forward with a career in this new and exciting -- new and exciting area.

A second area that is also quite useful, which has often partnerships across federal, state, and local government is thinking about efficiency in weatherization and those are things that save everybody money and are particularly valuable for those
populations that are lower income.

And also, you know, there is a lot of benefits too in terms of emissions but primarily they are also helpful to the people who live in those spaces.

Ms. Blunt Rochester. Thank you.

Ms. Frisch?

Ms. Frisch. Thank you for the question, and two additional examples are in clean electricity production and clean public transportation that can significantly reduce air emissions, which cause all kinds of problems like asthma and can actually reduce the length of people's lives.

And one of the great things about the subnational action that you mentioned with city, states, and businesses is that it is inherently local and those people's voices are coming to the table and they will talk with their policy makers and make policies that really work for them in those communities.

And I think what we are learning from that is the lesson we've always known that it is good to be reminded of -- that it really is about bringing people together. And for climate action in the U.S., I mean, let's face it, the way we often do federal policy the federal government lags behind public opinion and we are seeing this wave of public opinion about climate ready to
So we are happy that you and members of the subcommittee are really taking this seriously.

Ms. Blunt Rochester. Thank you.

Mr. Light, my next question is for you and it is based on the testimony that you gave. You had a statistic that really jumped out at me that China is investing ten times more than the United States in research and development.

Can you talk about the potential consequences of that discrepancy in funding? I actually lived in China for four years and I saw it first-hand. So if you could talk a little bit about that.

Mr. Light. It means that they are going to win the markets that have been created by the Paris Agreement. I mean, we can talk about, you know, whether the United States should have moved forward and the status of our pledge and whether agreement versus treaty and all that kind of stuff.

And in the meantime, China and the EU, Canada, other countries, are jumping ahead and grabbing the markets that were created by the fact the rest of the world is worried about climate change, they want to do something, and the prices are plummeting so it actually is affordable for them to move to solar power and
other things.

Otherwise, the prime minister of India would not be moving full force into this. If it was too expensive he wouldn't do it.

Ms. Blunt Rochester. Thank you so much.

I also wanted to ask a question about the impact of the $600 million going unspent that you talked about in your testimony. Can you briefly -- ten seconds.

Mr. Light. Sure. You all have allocated -- the last Congress -- put money into ARPA-E -- into the Bureau of Energy Efficiency and Research. NRDC has a very interesting analysis of this that is linked to in my testimony. That money is not being spent. It is not going forward there and I think that this is something where oversight from this committee is directly appropriate to make sure that money goes out the door and it goes in programs that are not driven by ideology -- that are driven by where is the place that we can put money in the near term that is going to get us the biggest bang in terms of something we can put out there and compete with these other countries that are already way ahead of us.


Mr. Tonko. The gentlelady yields back.
The chair now recognizes the representative from the state of New York -- Brooklyn. Yvette Clarke for five minutes.

Ms. Clarke. Thank you very much, Mr. Chairman. Thank you so much, Mr. Chairman, and I thank our panellists for really lending your expertise to us today as we grapple with this issue.

I represent Brooklyn, as our chairman introduced me, where in 2012 we saw the impact of climate change first hand when Superstorm Sandy devastated my district and, going forward, will only get worse.

I brought with me a map showing how sea level rise is an existential threat to New York City. Right there. And I wanted to talk about the flooded areas on the map are real communities.

We are talking about inundation of homes in communities like Gerritson Beach and Sheepshead Bay and all of our subway lines, quite frankly.

As the president claims there is a national emergency on the southern border, he is ignoring what I believe is a national emergency in his own back yard and in the absence of federal leadership, what should cities like mine be doing to increase our climate resiliency and prepare for the impact of sea level rise? And I would like to extend that the entire panel.

Ms. Frisch. Thank you for that question, and New York has
been a leader in working on resilience, particularly after Superstorm Sandy and making some of the infrastructure, raising it up so it is above sea level rise in the planning.

And that is a lesson that many communities across the U.S. are taking is that they need to evaluate what are those vulnerabilities and make a plan to address those vulnerabilities.

Ms. Clarke. Does anyone else want to answer?

Mr. Hultman. I mean, you know, community resilience is something everybody wants and I think that is something that is a point of agreement across a lot of different kinds of communities and leaders in those communities.

There are steps that can be taken today in a diversity of kinds of communities and New York, I think I will echo Ms. Frisch's comment, has been leading in thinking about integrating, for example, first response with kind of weather understanding and how to kind of integrate those different ways to think about near-term action to respond to natural hazards or disasters.

But that also has to be coupled with a longer term planning process that does involve different kinds of stakeholders in that -- in those community groups.

And looking at New York's example, looking at other places
1937 around the country as different places, we talked a lot about
1938 emissions today and responding to climate through emissions.
1939 So I appreciate your comment about thinking of climate as a much
1940 broader set of issues affecting us today.
1941 Those same studies date and business actions that are
1942 happening on emissions we can also see a lot of the same things
1943 happening on resilience, and I think this is a moment where we
1944 can use those experiments, we can use those understandings that
1945 are developing to better inform policy.
1946 Ms. Blunt Rochester. It is an emerging industry that has
1947 to look at climate change holistically and I think that looking
1948 at this from a piecemeal perspective disadvantages us
1949 tremendously. So opponents of climate change legislation argue
1950 that the cost of sort of building out a green economy is simply
1951 too high. But they ignore the cost of inaction.
1952 You talked about raising homes. It is extremely expensive
1953 to have to retrofit old housing stock in order to raise them,
1954 and just to address the whole resiliency issue.
1955 How do we put a price tag on the damage sea level rise will
1956 continue to inflict on communities like mine?
1957 Mr. Light. So I think that the National Climate Assessment
1958 just submitted to Congress this last past fall and I was -- I
worked on the national climate assessment on the chapter on mitigation. Look at that. I think the price figures are already there.

So in the higher -- in the higher scenario -- emission scenarios you are looking at sea level rise threatening a trillion dollar of assets both public and private in the United States.

If that is not enough to motivate something to be put into the next infrastructure bill, which is, we hope, coming down the pike, I am not exactly sure what is.

And in terms of what New York City needs to do and other cities like that, I would sort of say investment in natural infrastructure. We have known this from Superstorm Sandy. We have known this.

The most effective way and the most cost effective way and the way that you can actually get lots of jobs created in your districts is by having people enhance natural infrastructure and not only just trying to build sea walls which are always going to be based on difficult propositions in the future.

I think the more that Congress can do to make it possible for states to form cross-border alliances to achieve those kinds of things, because sea level rise is not going to respect the state boundaries, the better you are going to see a good outcome.
Ms. Clarke. Very well. My time has run out. I have several other questions but this is to be continued and I thank you once again for all of your insight and expertise today.

I yield back, Mr. Chairman.

Mr. Tonko. The gentlelady yields back.

The chair now recognizes the gentlelady from Illinois, Representative Schakowsky, for five minutes.

Ms. Schakowsky. Thank you very much, Mr. Chairman and panel. I am sorry that I missed most of it. Not all of it, and I really appreciate all of your participation.

So, first, I want to make a few remarks dealing with innovation. It seems to me that saying that we should focus on innovation rather than ambitious federal or international climate goals is a false choice.

Over the past several decades, we have seen industry claim time and time again that various federal rules and standards are overly burdensome, and maybe sometimes that is the case, but that they will put American companies out of business.

The auto industry told us that, quote, "We just do not have the technology to comply," end quote, with tail pipe standards, for example. We heard that requirements for reformulation of gasoline would result in, quote, "major supply disruptions,"
But these claims were not proven true and, in fact, history has shown that strong federal regulation and goals actually help drive further innovation.

The Clean Air Act is a perfect example of that. It used regulatory standards to drive technology, technological innovation, and pollution controls.

The act recognizes that usually costs that -- that it usually costs less to dump pollution for free than to clean it up. So businesses generally don't control pollution absent requirements.

Once an air pollution standard is in place, American industry gets to work and meets the challenge, and along the way we develop more effective and less expensive pollution control technologies.

Not only is our air cleaner, we also export the technology, it seems to me, that having to meet certain standards helps us develop the technologies that we can export around the world.

So not only is our air cleaner, we have seen that happen over and over again. So I would really like any of you who want to comment on the balance of regulation and technology, and I would be interested if anyone on this panel actually believes
that regulation in and of itself drives down innovation.

And so I would love to hear about that. Anyone, go ahead.

I only have two minutes.

Mr. Hultman. Thank you for the question. I will try to keep mine brief so if the others want to chime in they are free.

Your comment about not being a choice between deployment today and innovation I think is absolutely correct. I also agree that your phrasing of thinking about what policy driving the deployment of technology is an absolutely essential part which Mr. Thernstrom even referred to of pulling technologies into the market and many times we need those -- need that impetus to drive down or drive the technology deployment which therefore drives down the technology costs.

And I will want to kind of return to one point that has been made in a couple of ways. But we have seen -- we are in the middle of a revolution in energy costs right now -- the costs for solar and wind and, frankly, other technologies have dropped precipitously over the last decade. Even in the last seven or eight years we have seen, you know, solar costs drop by something like 70-plus percent.

So those costs are dropping and they are dropping not least because innovation is happening but also that there has been
deployment across a multitude of states, cities, businesses and, frankly, other countries.

Ms. Frisch. Thank you for the many participants from Illinois and we are still a coalition.

So to answer your question, analysis has shown that technology push plus from the policy pull including the regulations that you are talking about can actually get us further than either of the two. So think of one plus one equals three. You have to have both you only get so far with the technology push. You have to have the policy pull to move along.

So as far as the federal role, there is really an important role to make the priority clear so then the market can follow and get the progress and the benefits that you are talking about.

Ms. Schakowsky. I think, clearly, and predictability is really important but it seems to me, I know we are talking about -- oops, we will discuss it later offline.

Ms. Frisch. Would love to.

Ms. Schakowsky. Thank you. I yield back.

Mr. Tonko. I believe Mr. Light had a quick comment to make.

Mr. Light. Very quick. Very concrete example.

The conversation we were just having about 45Q that Mr. McKinley started was a great example of where -- we have got a
regulation. The incentive has created through 45Q -- that is supposed to help the technology like direct air capture go from this exploratory phase, way too expensive to be deployable to get something there.

But the price is not there. And so but if you combine the innovation side on direct air capture with 45Q and then you put it in a state like California which has got a carbon market, so you got policy innovation, then you are talking about combined price that stars to make a technology like that feasible and profitable.

That is the way they all three work together. The idea that, you know, we have got to sort of choose one path or another is just false.

Mr. Tonko. Thank you very much. I believe that concludes all the members who were choosing to be recognized.

I again thank the panel for their participation today and enduring the recess that required our absence for votes.

I now ask -- request unanimous consent to enter the following into the record: a report entitled "Getting to Zero Carbon Emissions in the Electric Power Sector" by Jesse Jenkins; the report entitled "Tracking Progress of the 2020 Climate Turning Point" by the World Resources Institute, the executive summary
of the report entitled, "Fulfilling America's Pledge: How States, Cities, and Businesses are Leading the United States to a Low-Carbon Future" by America's Pledge; the first United States Nationally Determined Contribution to the Paris Agreement; a letter from the U.S. Chamber of Commerce; the text of the Paris Agreement; and President Trump's statement on the administration's intended withdrawal from the agreement.

And so request unanimous consent there.

Without objection, so ordered. And, again, thank you to our panel. I remind members that pursuant to committee rules they have 10 business days by which to submit additional questions for the record to be answered by the witnesses who have appeared.

I ask each of our witnesses to please respond promptly to any such questions that you may receive.

And at this time, the subcommittee is adjourned.

[Whereupon, at 12:56 p.m., the committee was adjourned.]