AMERICAN ENERGY EXPANSION: STRENGTHENING ECONOMIC, ENVIRONMENTAL, AND NATIONAL SECURITY

HEARING

BEFORE THE

COMMITTEE ON ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED EIGHTEENTH CONGRESS

FIRST SESSION

JANUARY 31, 2023

Serial No. 118–1

Published for the use of the Committee on Energy and Commerce

govinfo.gov/committee/house-energy
energycommerce.house.gov

U.S. GOVERNMENT PUBLISHING OFFICE

51–279 PDF WASHINGTON : 2024

COMMITTEE ON ENERGY AND COMMERCE

CATHY McMORRIS RODGERS, Washington
Chair

MICHAEL C. BURGESS, Texas
ROBERT E. LATTA, Ohio
BRETT GUTHRIE, Kentucky
H. MORGAN GRIFFITH, Virginia
GUS M. BILIRAKIS, Florida
BILL JOHNSON, Ohio
LARRY BUCSHON, Indiana
RICHARD HUDSON, North Carolina
TIM WALBERG, Michigan
EARL L. "BUDDY" CARTER, Georgia
JEFF DUNCAN, South Carolina
GARY J. PALMER, Alabama
NEAL P. DUNN, Florida
JOHN R. CURTIS, Utah
DEBBBIE LESKO, Arizona
GREG PENCE, Indiana
DAN CRENSHAW, Texas
JOHN JOYCE, Pennsylvania
KELLY ARMSTRONG, North Dakota, *Vice Chair*
RANDY K. WEBER, SR., TEXAS
RICK W. ALLEN, Georgia
TROY BALDERSON, Ohio
RUSS FULCHER, Idaho
AUGUST PFLUGER, Texas
DIANA HARSHBARGER, Tennessee
MARIANNETTE MILLER–MEEKS, Iowa
KAT CAMMACK, Florida
JAY OBERNOLTE, California

FRANK PALLONE, JR., New Jersey
Ranking Member
ANNA G. ESHOO, California
DIANA DEGETTE, Colorado
JAN SCHAKOWSKY, Illinois
DORIS O. MATSUI, California
KATHY CASTOR, Florida
JOHN P. SARBANES, Maryland
PAUL TONKO, New York
YVETTE D. CLARKE, New York
TONY CÁRDENAS, California
RAUL RUIZ, California
SCOTT H. PETERS, California
DEBBIE DINGELL, Michigan
MARC A. VEASEY, Texas
ANN M. KUSTER, New Hampshire
ROBIN L. KELLY, Illinois
NANETTE DIAZ BARRAGÁN, California
LISA BLUNT ROCHESTER, Delaware
DARREN SOTO, Florida
ANGIE CRAIG, Minnesota
KIM SCHRIER, Washington
LORI TRAHAN, Massachusetts
LIZZIE FLETCHER, Texas

PROFESSIONAL STAFF

NATE HODSON, *Staff Director*
SARAH BURKE, *Deputy Staff Director*
TIFFANY GUARASCIO, *Minority Staff Director*

C O N T E N T S

WITNESSES

SUBMITTED MATERIAL

Inclusion of the following was approved by unanimous consent.

[1] The report has been retained in committee files and is available at https://docs.house.gov/meetings/IF/IF00/20230131/115356/HHRG-118-IF00-20230131-SD014.pdf.

AMERICAN ENERGY EXPANSION: STRENGTHENING ECONOMIC, ENVIRONMENTAL, AND NATIONAL SECURITY

TUESDAY, JANUARY 31, 2023

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
WASHINGTON, DC.

The committee met, pursuant to call, at 11:02 a.m., in the John D. Dingell Room 2123, Rayburn House Office Building, Hon. Cathy McMorris Rodgers (chair of the committee) presiding.

Members present: Representatives Rodgers, Burgess, Latta, Guthrie, Griffith, Bilirakis, Johnson, Bucshon, Hudson, Walberg, Carter, Duncan, Palmer, Dunn, Curtis, Lesko, Crenshaw, Joyce, Armstrong, Weber, Allen, Baldersen, Fulcher, Pfluger, Harshbarger, Miller-Meeks, Cammack, Obernolte, Pallone (ranking member), Eshoo, DeGette, Schakowsky, Matsui, Castor, Sarbanes, Tonko, Clarke, Cárdenas, Ruiz, Peters, Dingell, Veasey, Kuster, Kelly, Barragán, Blunt Rochester, Soto, Craig, Schrier, Trahan, and Fletcher.

Staff present: Kate Arey, Content Manager and Digital Assistant; Jolie Brochin, Clerk, Health; Sarah Burke, Deputy Staff Director; Michael Cameron, Professional Staff Member, Innovations, Data, and Commerce; Lauren Eriksen, Clerk, Oversight and Investigations; Theresa Gambo, Financial and Office Administrator; Jessica Herron, Clerk, Innovations, Data, and Commerce; Nate Hodson, Staff Director; Tara Hupman, Chief Counsel; Noah Jackson, Clerk, Communications and Technology; Sean Kelly, Press Secretary; Peter Kielty, General Counsel; Emily King, Member Services Director; Elise Krekorian, Professional Staff Member, Energy; Giulia Leganski, Professional Staff Member, Communications and Technology; Mary Martin, Chief Counsel, Energy and Environment; Brandon Mooney, Deputy Chief Counsel, Energy; Clare Paoletta, Professional Staff Member, Health; Kaitlyn Peterson, Clerk, Energy and Environment; Peter Spencer, Senior Professional Staff Member, Energy; Michael Taggart, Policy Director; Hannah Anton, Minority Staff Assistant; Waverly Gordon, Minority Deputy Staff Director and General Counsel; Tiffany Guarascio, Minority Staff Director; Anthony Gutierrez, Minority Professional Staff Member; Caitlin Haberman, Minority Staff Director, Environment, Manufacturing, and Critical Minerals; Perry Hamilton, Minority Member Services and Outreach Manager; Kris Pittard, Minority Professional Staff Member; Greg Pugh, Minority Staff Assistant; Caroline Rinker, Minority Press Assistant; Kylea Rogers, Minority Policy Analyst; Andrew Souvall, Minority Director of

Communications, Outreach, and Member Services; Medha Surampudy, Minority Professional Staff Member; Rebecca Tomilchik, Minority Junior Professional Staff Member; Isaac Velez, Minority Intern; Tuley Wright, Minority Staff Director, Energy, Climate, and Grid Security; and C.J. Young, Minority Deputy Communications Director.

Mrs. RODGERS. The committee will come to order.

The Chair recognizes herself for 5 minutes for an opening statement.

OPENING STATEMENT OF HON. CATHY McMORRIS RODGERS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WASHINGTON

Welcome to our first Energy and Commerce Committee meeting hearing of the 118th Congress, especially to our new subcommittee chairs: Jeff Duncan, who is our new chair of Energy, Climate, and Grid Security Subcommittee, and Bill Johnson, who will chair the Environment, Manufacturing, and Critical Minerals Subcommittee.

Energy is foundational to every aspect of our lives. Whether it is making energy more affordable and reliable, securing our supply chains, beating China, protecting the environment, addressing climate change, or putting energy security back at the center of policy making, these should be bipartisan goals, and we have already proven they can be over the last few weeks.

One of our actions on the floor was passing H.R. 22, the Protecting America's Strategic Petroleum Reserve from China Act. And it passed with 113 Democrats voting for it. And then just last week H.R. 21, the Strategic Production Response Act, in another bipartisan vote to help ensure a vital energy asset isn't drained for nonemergency political purposes.

These are just the beginning of a robust agenda to restore American energy dominance. We need to be doing more to secure and unleash American energy. Rush-to-green policies have had a devastating effect in Europe. Countries are rationing energy, switching back to coal-fired plants, and people are dying due to a lack of heat and electricity. America doesn't have to follow Europe down this path. Addressing emissions and unleashing abundant, affordable, and reliable energy aren't mutually exclusive.

In the last decade we have led the world in emissions reduction while increasing the availability of affordable energy through innovation. We did this while maintaining some of the highest environmental and labor standards in the world, and we must continue innovating and taking advantage of our abundant natural resources and reducing emissions.

Natural gas is one of our greatest economic and strategic resources. We cannot afford to shut it down. Instead, we must expand production and continue building pipelines, the safest, most reliable infrastructure to move it around the country, and increase our capacity to export LNG to the rest of the world, to reduce carbon emissions, and combat Russia and China's use of energy to expand their authoritarian influence.

We also have an opportunity to achieve a new renaissance in American nuclear technology and once again lead the world in its development and deployment. But to be successful, we need to rethink our restrictive regulatory approach and combat the antiscience opposition to expanding nuclear energy. We need to review the Nuclear Regulatory Commission's procedures and practices to be sure it can efficiently license new and advanced reactors.

Thankfully, we are close to finishing the Vogtle plant in Georgia, but one new nuclear plant isn't enough. Ensuring safe nuclear power is essential for ensuring American energy and also for protecting the environment and addressing climate change. And we can do this without inefficient, burdensome regulations. Safety cannot be an excuse for doing nothing.

To reestablish American nuclear energy globally, we need to approve and build new advanced reactors, establish a permanent spent fuel repository, while exploring the potential for fuel recycling, and establish a reliable domestic fuel industry that supplies and enriches uranium and reduces our reliance on Russia.

Across the board we need to update the regulatory landscape to pave the way for energy sources and technologies of all kinds: hydropower, nuclear, natural gas, and oil, hydrogen, along with wind, solar, and batteries. Republicans support all of these technologies, but we do not support picking winners and losers through massive subsidies and rigging regulations to favor certain industries.

Our energy solutions are climate solutions. We have a responsibility to our generation and future generations for cleaner water, air, and reduced emissions. Every energy technology and source has a role to play, but we need to be able to ensure that we are not becoming entirely dependent on unreliable, intermittent energy sources that rely on Chinese supply chains.

It is time to flip the switch and unleash American energy, and this committee is at the very center of securing our global leadership and making people's lives better.

I want to work with everyone, Republicans and Democrats, to achieve these goals. These cannot continue to be partisan issues. And my door is open to every member of this committee who wants to lead on unleashing American energy.

[The prepared statement of Mrs. Rodgers follows:]

Chair Cathy McMorris Rodgers Opening Remarks
Full Committee Hearing
American Energy Expansion: Strengthening Economic, Environmental, and National Security
January 31, 2023

As prepared for delivery

Welcome to our first Energy and Commerce Committee hearing of the 118th Congress...

… especially to our new subcommittee chairs... Jeff Duncan, who's our new Chair of the Energy, Climate, and Grid Security Subcommittee...

...and Bill Johnson, who'll Chair the Environment, Manufacturing, & Critical Minerals Subcommittee.

Energy is foundational to every aspect of Americans' lives.

Whether it's making energy more affordable and reliable, securing our supply chains, beating China, protecting the environment, addressing climate change, or putting energy security back at the center of policymaking.

These should be bipartisan goals, and we've already proven they can be over the last few weeks.

One of our actions on the floor was passing H.R. 22, the Protecting America's Strategic Petroleum Reserve from China Act…

...which passed with 113 Democrats voting for it.

And last week, we passed H.R. 21, the Strategic Production Response Act, in another bipartisan vote...

...to help ensure a vital energy asset isn't drained for non-emergency, political purposes.

These are just the beginning of a robust agenda to restore American energy dominance.

We need to be doing more to secure and unleash American energy.

'Rush to green' policies have had a devasting effect in Europe...

...countries are rationing energy, switching back to coal fired plants, and people are dying due to lack of heat and electricity.

America doesn't have to follow Europe down this path.

Addressing emissions and unleashing abundant, affordable, and reliable energy aren't mutually exclusive.

In the last decade, we've led the world in emissions reductions while increasing the availability of affordable energy through innovation.

We did this while maintaining some of the highest environmental and labor standards in the world.

We must continue innovating, taking advantage of our abundant natural resources, and reducing emissions.

Natural gas is one of our greatest economic and strategic resources... we cannot afford to shut it down.

Instead, we must expand production and continue building pipelines…

… the safest, most reliable infrastructure to move it around the country…

...and increase our capacity to export LNG to the rest of the world to reduce carbon emissions and combat Russia and China's use of energy to expand their authoritarian influence.

We also have an opportunity to achieve a new renaissance in American nuclear technology and once again lead the world in its development and deployment…

… but to be successful we need to rethink our restrictive regulatory approach and combat the anti-science opposition to expanding nuclear energy.

We need to review the Nuclear Regulatory Commission's procedures and practices, to be sure it can efficiently license new and advanced reactors.

Thankfully we are close to finishing the Vogtle Plant in Georgia, but one new nuclear plant isn't enough.

Ensuring safe nuclear power is essential for securing American energy, and also for protecting the environment and addressing climate change...

...and we can do this without inefficient, burdensome regulations. Safety cannot be an excuse for doing nothing.

To reestablish American nuclear leadership globally, we need to approve and build new, advanced reactors…

… establish a permanent spent fuel repository, while exploring the potential for fuel recycling…

… and establish a reliable domestic fuel industry that supplies and enriches uranium and reduces our reliance on Russia.

Across the board, we need to update the regulatory landscape to pave the way for energy sources and technologies of all kinds…

Hydropower, nuclear, Natural gas and oil, hydrogen…

… along with wind, solar, and batteries.

Republicans support all of these technologies, but we do not support picking winners and losers through massive subsidies and rigging regulations to only favor certain industries.

Our energy solutions are climate solutions. We have a responsibility to our generation and future generations for cleaner water, air, and reduced emissions.

Every energy technology and source has a role to play...

...but we need to be able to ensure we are not becoming entirely dependent on unreliable, intermittent energy sources that rely on Chinese supply chains.

It's time to flip the switch and unleash American energy...

...and this committee is at the very center of securing our global leadership and making people's lives better.

I want to work with everyone, Republicans and Democrats, to achieve these goals.

These can't continue to be partisan issues, and my door is open to every Member of this Committee who wants to lead on unleashing American energy.

I'll now recognize our full committee Ranking Member, Mr. Pallone, for five minutes for his opening statement.

Mrs. RODGERS. And now I will recognize our full committee ranking member, Mr. Pallone, for 5 minutes for his opening statement.

OPENING STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. PALLONE. Thank you, Chairwoman Rodgers.

And we just had our organizational meeting, and for those in the public, we are very proud of the fact that we now have the first woman chairperson of the Energy and Commerce Committee in its long history that goes back to almost the first days of the Republic.

So let me just make that announcement. I am sure all of you recognize it, but I want to mention it again.

Now, I want to say that we are meeting for the committee's first hearing of the 118th Congress. The first few weeks of any Congress are an opportunity to lay out our priorities for the next 2 years. But, unfortunately, the energy bills that Republicans have brought to the floor this month have only demonstrated just how misguided and misplaced their priorities are.

Both bills that were mentioned by the chairwoman—the one that dealt with the Strategic Petroleum Reserve in China and the one we just dealt with last week that dealt with the Strategic Petroleum Reserve and said that we couldn't use it unless we opened up more public lands on the same percentage basis—they are both misguided because they limited this administration—or it was an attempt to limit this administration's ability to bring down gasoline prices at the pump. And instead of moving towards clean energy, which is the future and the only way that we are going to have less dependence on dictators and have less volatility in the market, it was an attempt to try to give more opportunities to Big Oil, which, frankly, they don't even want, right.

I mean, we know that during this gasoline crisis that we have had over the past year or so, this idea that somehow Big Oil wanted to pump more, they wanted to pump the leases they already had, was simply not the case. They wanted to keep the price artificially high. That is another reason why they opposed using the Strategic Petroleum Reserve: because it brought prices down.

So all I am basically saying is, as we move towards an energy transition, let's keep in mind that encouraging renewables—as we did with the Inflation Reduction Act, as we did with the Bipartisan Infrastructure Law—this is the way to go in the future.

I am certainly one of the key people that believes that we have to use all sources of energy, whether it is nuclear, hydropower, the other things that the chairwoman mentioned, certainly all of the above. But the bottom line is that we are going to be left behind if we don't move towards renewables and encourage them the way we did with the Inflation Reduction Act.

Now, the chairwoman mentioned China. Now, make no mistake that the rest of the world, including China, are already embarked in a major transmission to clean energy. In fact, China's investments in clean energy are so vast that the International Energy Agency forecasts that over the next several years 40 percent of solar and wind energy growth will come from China alone. And yet Republicans consistently oppose our efforts to catch up. If we don't move towards clean energy, if we don't use the proceeds of and the credits and the other incentives from the Inflation Reduction Act, we are going to be left behind. And that is going to mean left behind in terms of innovation, left behind in terms of the number of jobs that are created. And the irony of it is that although most, if not all, Republicans in the House voted against the Inflation Reduction Act, that many of those credits are going to the very red States and the industries in the very red States that want to take advantage of it.

So this is not a Republican or Democratic issue. This is a bipartisan issue. We need to move towards clean energy.

Madam Chair, I just wanted to mention that one of our witnesses today is Dr. Unruh Cohen. I want to thank her for all of her work as staff director for the Select Committee on the Climate Crisis. I look forward to her testimony and the testimony of all of the panel.

But I just wanted to take a moment to thank my long-time—or our long-time—staff director of our Energy and Environment policy team, Rick Kessler, who is retiring this week. After 25 years of dedicated service to Congress, of which 12 years was spent with this committee, Rick has more than earned his retirement.

Earlier in his career Rick also worked in my personal office on energy and environmental issues. And last Congress, Rick was instrumental in our work on the Inflation Reduction Act, fighting to make sure meaningful climate investments, including many provisions from our own Clean Future Act, were included.

And during his tenure he was also instrumental in helping us pass the Frank Lautenberg Chemical Safety Act, the Pipeline Safety Act, legislation phasing down the use of dangerous HFCs, and many, many more energy and environmental laws.

So he has been a devoted member of my team and our team, always guiding us by a sincere desire to improve people's lives. And I am personally grateful for his many years of service, wish him nothing but the best in the future.

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

[The prepared statement of Mr. Pallone follows:]

Committee on Energy and Commerce

Opening Statement as Prepared for Delivery
of
Ranking Member Frank Pallone, Jr.

Hearing on "American Energy Expansion: Strengthening Economic, Environmental, and National Security"

January 31, 2023

Thank you, Chair Rodgers. We are very proud of the fact that we now have the first woman to chair of the Energy and Commerce Committee and its long history that goes back to almost the first days of the Republic.

I want to say that we are meeting for the Committee's first hearing of the 118th Congress. The first few weeks of any Congress are an opportunity to lay out priorities for the next two years. Unfortunately, the energy bills that Republicans have brought to the floor this month have only demonstrated just how misguided and misplaced their priorities are.

Two bills were mentioned by the Chair, one that bans the sale of oil from the Strategic Petroleum Reserve (SPR) to China and one that prevents the use of the SPR unless we opened up more public lands for drilling on the same percentage basis. They're both misguided because they're an attempt to limit this Administration's ability to bring down gasoline prices at the pump.

Moving towards clean energy is the future and the only way we're going to have less dependence on dictators and less volatility in the market. Both these bills were an attempt to try to give more opportunities to Big Oil.

Republicans have pushed this idea that somehow Big Oil wanted to pump more but couldn't. In reality, they wanted to keep the price artificially high.

That's another reason why they opposed using the Strategic Petroleum Reserve because it brought prices down, so all I'm basically saying is as we move towards an energy transition let's keep in mind that encouraging renewables as we did with the Inflation Reduction Act and Bipartisan Infrastructure Law.

This is the way to go in the future. I'm someone who believes that we have to use all sources of energy like nuclear and hydropower.

The bottom line is we're going to be left behind if we don't move towards renewables.

The Chair also mentioned China. Make no mistake: the rest of the world, particularly China, has already embarked on a major transition to clean energy. In fact, China's investments in clean energy are so vast, the International Energy Agency forecasts that over the next several years, 40 percent of solar and wind energy growth will come from China alone. Yet Republicans consistently oppose our efforts to catch up.

If we don't move towards clean energy and if we don't use the incentives from the Inflation Reduction Act, we're going to be left behind—left behind in innovation and left behind in number of jobs created. The irony of it is, most if not all, Republicans in the House voted against the Inflation Reduction Act, yet many of those credits are going to Red States and industries in the Red States that want to take advantage of those credits.

This is not a Republican or Democratic issue. This is a bipartisan issue. We need to move towards clean energy.

Madam Chair, I just wanted to mention that one of our witnesses today is Dr. Unruh Cohen. I want to thank her for all of her work as Staff Director for the Select Committee on the Climate Crisis. I look forward to her testimony and the testimony of all the panel.

I just want to take a moment to thank our longtime staff director of our energy and environment policy team, Rick Kessler, who is retiring this week. After 25 years of dedicated service to Congress – of which 12 years were spent with this Committee – Rick has more than earned his retirement. Earlier in his career, Rick also worked in my personal office on energy and environmental issues. Last Congress, Rick was instrumental in our work on the Inflation Reduction Act, fighting to make sure meaningful climate investments – including many provisions from our own CLEAN Future Act – were included. During his tenure, he was also instrumental in helping us pass the Frank R. Lautenberg Chemical Safety Act, the Pipeline Safety Act, legislation phasing down the use of dangerous HFCs, and many, many more energy and environmental laws.

He has been a devoted member of our team, always guided by a sincere desire to improve peoples' lives, and I am personally grateful for his many years of service. I wish him nothing but the best in the future.

Mrs. RODGERS. All the best, Rick.

The Chair recognizes Energy, Climate, and Grid Security Subcommittee Chair Duncan for 5 minutes.

OPENING STATEMENT OF HON. JEFF DUNCAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF SOUTH CAROLINA

Mr. DUNCAN. Thanks for recognizing me.

I first want to start by saying congratulations on holding your first hearing as chair of the Energy and Commerce Committee. You have been a champion of expanding all forms of American energy, and I looked forward to working with you and the rest of the committee to deliver affordable and reliable energy to all Americans.

I look forward to also getting to know my colleagues on the subcommittee on both sides of the aisle and trying to find common ground that we can work on to move America forward.

I also want to thank all the Democrat Members that voted for the SPR last week. It was a true bipartisan bill that voted out of the floor, and thank you for that.

I want to thank the four witnesses that have attended the hearing today. I look forward to your insights on the state of American energy.

America became the global leader in crude oil and natural gas production while also leading the world in emission reductions. We did this by encouraging the entrepreneurial spirit in the private sector. The shale evolution is a perfect example of this. It is estimated that shale evolution saved U.S. consumers $203 billion annually. That breaks down to about $2,500 per family of four. It also lowered energy-related greenhouse gas emissions by 527 million metric tons per year, the most in the world. American energy production and emissions reduction are not mutually exclusive.

Unfortunately, Democrats and President Biden's regressive energy agenda takes a whole-of-government approach to phase out the oil and gas industry, and that is just wrong. Their agenda discourages investment, and the top-down aggressive regulatory approach seeks to create government-controlled economy and energy sectors.

Republicans on Energy and Commerce have solutions to reverse the Democrats' regressive energy agenda. It starts with unleashing all forms of American energy by creating a regulatory structure that encourages investment and innovation to bring all forms of energy online.

Energy is the foundation of our economy, and it impacts every aspect of American life. High energy prices hit low-income and middle-class Americans the hardest. According to the EIA, one-third of American households struggle to pay their energy bills. One in five households have to forego basic human necessities like food and medicine in order to keep the lights on and heat their homes. The Democrats rush-to-green policies are making energy unaffordable for American families. High energy increases the price of everything and contributes to rising inflation.

Our policies put the American consumer first so they don't have to decide between putting food on the table or keeping the lights on.

Ensuring we not only have affordable energy but also reliable energy is critical. There is no question a secure and resilient power grid is necessary for national security and a strong economy.

For these reasons, our energy grid is an attractive target for our adversaries. Pipelines, refineries, and other energy infrastructure are also extremely vulnerable to attack. Our policies must prioritize strengthening and hardening our grid and energy infrastructure. Energy security is national security, and our ability to export plays an important role in this.

Since Congress lifted the crude oil export ban in 2015, we have seen the benefits of free trade and open markets in the energy sector. When America is the world leader in energy production, the world is a safer place. There is no doubt about that.

We can and should export to energy-dependent countries who rely on corrupt nations. We have seen how Putin has used energy as a political weapon to keep this stranglehold over Europe. The best way to decrease the leverage of OPEC and Russia and the best weapon against Putin is a more aggressive U.S. energy production policy.

Nuclear energy also plays a critical role in energy security. Exporting our nuclear technologies gives us the ability to set global nuclear norms. Many of our adversaries recognize this and are prioritizing building up their nuclear sector. It is time the United States takes a hard look at the regulatory obstacles that stand in the way of nuclear advancement in this country.

Republicans have solutions to bring more nuclear on line by addressing inefficiencies in the permitting process while also maintaining our global gold standard in nuclear safety.

I look forward to working with my colleagues on both sides of the aisle to bring more nuclear on line so that we can once again be a global leader.

The ranking member mentioned China. There is no doubt that China is adding wind and solar and other renewables to their energy matrix. They are also building a heck of a lot of coal-fired power plants, fossil fuel generation, mining rare earths that they need for all the technology, which is very detrimental to the environment.

So we have got to address those issues. China will be a big part of that addressing.

And I want to thank Chair Rodgers for holding this timely hearing. It is time to flip the switch, unleash American energy production, and achieve American energy dominance. I look forward to the hearing and from our witnesses.

And with that, I yield back.

[The prepared statement of Mr. Duncan follows:]

FINAL

Jeff Duncan (SC-03) Opening Remarks
Full Committee Hearing
American Energy Expansion: Strengthening Economic, Environmental, and National Security
January 31, 2023
As prepared for delivery

Thank you for recognizing me.

I want to start by congratulating Chair Rodgers on holding her first hearing as Chair of the Energy and Commerce Committee. She has been a champion of expanding all forms of American energy and I look forward to working with her and the rest of this committee to deliver affordable and reliable energy to all Americans.

I also want to thank our four witnesses for being here today, I look forward to your insights on the state of American energy.

America became the global leader in crude oil and natural gas production while also leading the world in emissions reductions. We did this by encouraging the entrepreneurial spirit in the private sector. The shale revolution is a perfect example of this. It is estimated that the shale revolution saved US consumers $203 billion dollars annually , breaking down to $2,500 dollars for a family of four. It also lowered energy-related greenhouse gas emissions by 527 million metric tons per year.

American energy production and emissions reductions are not mutually exclusive.

Unfortunately, the Democrats and President Biden's regressive energy agenda takes a whole of government approach to phase the oil and gas industry out of existence.

Their agenda discourages investment, and the top-down aggressive regulatory approach seeks to create a government-controlled economy and energy sector.

Republicans on Energy and Commerce have solutions to reverse the Democrats' regressive energy agenda. It starts with unleashing all forms of American energy by creating a regulatory structure that encourages investment and innovation to bring all forms of energy online.

Energy is the foundation of our economy and impacts every aspect of American life. High energy prices hit low-income and middle-class Americans the hardest. According to the EIA, one-third of American households struggle to pay their energy bills. One in five households have to forgo basic human necessities like food and medicine in order to keep the lights on and heat their homes. The Democrat's "rush to green polices" are making energy unaffordable.

High energy increases the price of everything and contributes to rising inflation. Our policies put the American consumer first, so they don't have to decide between putting food on the table or keeping the lights on.

Ensuring we not only have affordable energy, but also reliable energy is critical. There is no question -- a secure and resilient power grid is necessary for national security and a strong economy. For these reasons, our energy grid is an attractive target for our adversaries. Pipelines, refineries, and other energy infrastructure are also extremely vulnerable to attack. Our policies must prioritize strengthening and hardening our grid and energy infrastructure.

Energy security is national security and our ability to export plays an important role in this. Since Congress lifted the crude oil export ban in 2015, we have seen the benefits of free trade and open markets in the energy sector. When America is a world leader in energy production, the world is a safer place. We can and should export to energy dependent countries who rely on corrupt nations. We have seen how Putin has used energy as a political weapon to keep his stranglehold over Europe. The best way to decrease the leverage of OPEC and Russia and the best weapon against Putin is more U.S. energy production.

Nuclear energy also plays a critical role in energy security. Exporting our nuclear technologies gives us the ability to set global nuclear norms. Many of our adversaries recognize this and are prioritizing building up their nuclear sector. It is time the United States takes a hard look at the regulatory obstacles that stand in the way of nuclear advancement in this country. Republicans have solutions to bring more nuclear online by addressing inefficiencies in the permitting process while also maintaining our global gold standard in nuclear safety. I look forward to working with my colleagues on both sides of the aisle to bring more nuclear online so we can once again be a global leader.

Thank you again Chair Rodgers for holding this hearing. It is time we Flip the Switch, Unleash American Energy Production, and achieve energy dominance.

I look forward to hearing from our witnesses and I yield back.

Mrs. RODGERS. The Chair recognizes Ranking Member DeGette for 5 minutes.

OPENING STATEMENT OF HON. DIANA DEGETTE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF COLORADO

Ms. DEGETTE. Thank you so much, Madam Chair. It is really fun to say that.

And I want to say one of the things that makes the Energy and Commerce Committee so unique is not just our vast jurisdiction but the willingness of Members to work together in a bipartisan way to get things done for the American people.

I have had the honor of serving on this storied committee since I was a freshman Member of Congress. As the chair of the Oversight and Investigations Subcommittee for the past 4 years, I am proud of the work that we did to hold the oil and gas industries accountable for the high gas prices last year and to help move our country forward.

In just the past 4 years, the full committee has passed legislation to strengthen our energy infrastructure, accelerate the deployment of new clean energy technologies, and help reduce the harmful emissions that are driving the climate crisis.

Thanks to those efforts, we have put our Nation on course to becoming truly energy independent and no longer dependent on the global oil market, which is the goal. And so I am hoping this hearing doesn't indicate that the majority is looking for ways to turn back the clock on that progress.

I was disturbed that the majority memo that I read didn't mention renewable energy sources one single time and instead doubled down on, frankly, outdated policies advocating increased fossil fuel production which will impede U.S. energy independence and make us more—ironically make us more dependent on an unstable international market. And that is because oil and gas is an international market, and so if we produce for here, it just goes into the international market.

We have all heard the slogans "drill, baby, drill," "energy dominance," and now "energy expansion," but don't be fooled. These policies will not expand our potential for new renewable energy sources, such as wind and solar, and that will only increase our dependence on oil and gas. So that will weaken our economic, environmental, and national security in the process. They are nothing more than a giveaway to the oil industry to further pad their profits.

Now, like Ranking Member Pallone, I was dismayed by the early energy bills considered on the floor. Just last week Congress considered H.R. 21, a bill that would open up our public lands to oil and gas exploitation and limit the President's ability to respond to future energy emergencies through the SPRO. We have seen this all-out push to expand oil and gas drilling before, and it just doesn't work.

Last February the United States produced more than 11 million barrels of oil per day, one of the highest levels of crude oil production in U.S. history. But when Vladimir Putin launched his war of aggression in Ukraine, the price of gasoline skyrocketed. And we as a nation were immediately reminded of how reliant we continue to be on a global commodity that is subject to disruptions of international markets.

The only way to secure our economic prosperity, our environment, and our national security is to break the addiction to oil as soon as possible. And so to do that, we must transition to clean energy technologies.

Now, I think that we could work across the aisle on this. I think that we could work together on supporting the research that we need to advance new clean energy technologies that will both make us energy independent and help us reach our Nation's climate goals.

I think—I am sorry that my colleagues didn't support the CHIPS and Science Act that has made investments in our energy and science agencies. But I will also say I do think—and I am looking forward to working with Chair Duncan and with our friends on the other side of the aisle. We have already talked. And I do think that we can find bipartisan ways to both reduce our dependence on the international oil market and also to develop clean energy that will address the climate crises.

But what we have to do, Madam Chair, in my opinion, we have to stop retreating to our corners and seeing everything as a zero sum game for whatever side. The markets and the utility companies and others have realized this. They have been moving to clean energy sources as fast as they can, and they need our help to be able to have the research and development to be able to make this secure, to make the grid secure, and to make the sources so that we can transition to a clean energy economy, be independent, and also address the climate crisis.

So I look forward to working with you and with this committee. I am excited about it. But we have to really hold out the branch and not talking about just drilling.

With that, Madam Chair, I yield back.

[The prepared statement of Ms. DeGette follows:]

Committee on Energy and Commerce

Opening Statement as Prepared for Delivery
of
Subcommittee on Energy, Climate, and Grid Security Ranking Member Diana DeGette

Hearing on "American Energy Expansion: Strengthening Economic, Environmental, and National Security"

January 31, 2023

Thank you so much, Madam Chair—it's really fun to say that.

I want to say one of the things that makes the Energy and Commerce Committee so unique is not just our vast jurisdiction, but the willingness of members to work together in a bipartisan way to get things done for the American people.

I've had the honor of serving on this storied committee since I was a freshman member of Congress. As the Chair of the Oversight and Investigation subcommittee for the past four years, I'm proud of the work that we did to hold the oil and gas industries accountable for the high gas prices last year and to help move our country forward.

In just the past four years, the full Committee has passed legislation to strengthen our energy infrastructure, accelerate the deployment of new clean energy technologies, and help reduce the harmful emissions that are driving the climate crisis.

Thanks to those efforts, we've put our nation on course to becoming truly energy independent, and no longer dependent on the global oil market, which is the goal. I'm hoping this hearing doesn't indicate that the Majority is looking for ways to turn back the clock on that progress.

I was disturbed that the Majority memo that I read didn't mention renewable energy sources one single time and, instead, doubled down on frankly outdated policies advocating for increased fossil fuel production, which will impede U.S. energy independence, and, ironically, make us more dependent on an unstable international market.

That's because, oil and gas is an international market—if we produce more here, it just goes into the international market.

We've all heard the slogans, "drill, baby drill," "energy dominance", and now, "energy expansion". But don't be fooled; these policies will not expand our potential for new renewable energy sources, such as wind and solar. They will only increase our dependence on oil and gas, and that will weaken our economic, environmental, and national security in the process.

They're nothing more than a giveaway to the oil industry to further pad their profits.

Like Ranking Member Pallone, I was dismayed by the early energy bills considered on the floor.

Just last week, Congress considered H.R. 21, a bill that would open our public lands to oil and gas exploitation and limit the President's ability to respond to future energy emergency through the SPR.

We've seen this all-out push to expand oil and gas drilling before, and it just doesn't work. Last February, the United States produced more than 11 million barrels of oil per day—one of the highest levels of crude oil production in US history. But when Vladimir Putin launched his war of aggression in Ukraine, the price of gasoline skyrocketed. We as a nation were immediately reminded of how reliant we continue to be on a global commodity that is subject to disruptions of international markets.

The only way to secure our economic prosperity, our environment and our national security is to break the addiction to oil as soon as possible. To do that, we must transition to clean energy technologies. I think that we could work across the aisle on this. I think that we could work together on supporting the research that we need to advance new clean energy technologies that will both make us energy independent and help us reach our nation's climate goals.

I'm sorry that my colleagues didn't support the CHIPS and Science Act that made investments in our energy and science agencies. I'm looking forward to working with Chair Duncan and with our friends on the other side of the aisle; we've already talked and I do think that we can find bipartisan ways to both reduce our dependence on the international oil market and also to develop clean energy that will address the climate crisis.

But what we have to do, Madam Chair, in my opinion, we have to stop retreating to our corners, seeing everything as a zero-sum game for whatever side. The markets, the utility companies, and others have realized this. They have been moving to clean energy sources as fast as they can. They need our help to be able to have the research and development to be able to make this secure, to make the grid secure, and to make the sources so that we can transition to a clean energy economy, be independent, and address the climate crisis.

I look forward to working with you and with this committee–I'm excited about it. We have to really hold out the branch and not talk about just drilling.

With that, Madam Chair, I yield back.

Mrs. RODGERS. The Chair recognizes subcommittee chair for Environment, Manufacturing, and Critical Minerals, Subcommittee Chair Johnson, for 5 minutes.

OPENING STATEMENT OF HON. BILL JOHNSON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OHIO

Mr. JOHNSON. Thank you, Madam Chair.

I too want to congratulate you for being selected as the chair of the best committee in the House of Representatives, the House Energy and Commerce Committee, and for holding your first full committee hearing as chair and making it about such a vital issue, "American Energy Expansion: Strengthening Economic, Environmental, and National Security," and I too look forward to working with you and our Members on both sides of the aisle to do the right things.

I agree that it is time for all members of our committee to get to work to come up with solutions to the major problems driving inflation in our country, a staggering inflation which threatens to lower all Americans' standard of living and make us less secure.

Just over 2 years ago, America was energy dominant for the first time in 70 years. We were the largest energy producer in the world, and fuel for our homes and automobiles was affordable for working Americans. Unfortunately, the President and the Democrat majorities in the last Congress decided to wage an all-out legislative regulatory and public relations campaign to suppress that energy dominance, leading to skyrocketing and unaffordable gasoline, natural gas, and electricity prices for many Americans. Not just that, but rather than relying on superior American innovation and ingenuity to solve emission issues—which we have demonstrated, by the way, we are clearly able to do—this campaign against American energy and energy workers is attempting to cancel proven, increasingly cleaner forms of existing energy resources in favor of only a few forms of weather-dependent energy sources. And that has very serious negative economic and national security implications.

Put simply, energy security is national security. We have heard it said over and over again, and it is true. It takes energy to produce raw materials, to manufacture products, to produce farm products, like produce, eggs and poultry, and pork and beef, to get those products to market.

In fact, energy is at the center of everything. Americans have seen firsthand—they are living it—that limiting domestic energy production and cheapening the value of the dollar through reckless Federal spending is a textbook way to drive inflation higher. We can do better. We must do better.

Now, I am not reflexively opposed to some of the Democrats' solutions being proposed, like, for example, greater renewal deployment in our country, but where I struggle is with the practical implementation of these policies and plans, the cost and potentially negative impacts on the quality of life for American consumers.

We can't just take what sounds good in townhalls and wealthier coastal or metropolitan areas and suggest that folks in less wealthy, more rural areas just jump in line and do it as well. If we want viable, sustainable energy solutions that make all Americans secure, that appreciates the diversity of our landscapes and doesn't rely on premature aspirational technologies or the availability of mineral supplies from foreign countries being available, then it is time to turn the page on the current national energy strategy, or a lack thereof, particularly since it is one that makes us more dependent on nations that hate us.

To illustrate the point, I ask my colleagues to consider a recent report in the Washington Post. It suggested senior U.S. military officials are predicting and preparing for war within 1 to 5 years with China, the very country we depend on for the critical minerals required for many of the rush-to-green solutions. This is why we need to maximize the production of clean, reliable, affordable American energy and the associated critical minerals right here at home, along with improving the permitting process so investors aren't deterred by government-imposed barriers and uncertainty for new energy infrastructure projects.

And, friends, it is time to get serious about making rolling blackouts on our energy grid a thing of the past and lowering gasoline prices with increased American domestic production, rather than being dependent on artificial market interventions by the White House.

More domestic supply is necessary to meet these challenges, and we shouldn't fool ourselves into thinking that draining our Strategic Petroleum Reserve assets is a recipe for success. We produce energy better, safer, and cleaner than any other place in the world. These facts used to be a source of national strength and pride, not to mention American international diplomacy.

Let me conclude with a hearty welcome to our witnesses today. I appreciate that you are here, and I look forward to you sharing your experiences with us.

With that, Madam Chair, thank you for yielding to me. I yield back the balance—well, I have exceeded my time.

[The prepared statement of Mr. Johnson follows:]

Bill Johnson (OH-06) Opening Remarks
Full Committee Hearing
American Energy Expansion: Strengthening Economic, Environmental, and National Security
January 31, 2023

As prepared for delivery

Thank you, Madame Chair.

I want to congratulate you for being selected as Chair of the best committee in the House of Representatives…the House Energy and Commerce Committee…and for holding your **first** full committee hearing as Chair and making it about such a vital issue - *American Energy Expansion: Strengthening Economic, Environmental, and National Security.*

I agree that it's time for **all** members of our committee to get to work to come up with solutions to the major problems driving inflation in our country…a staggering inflation which threatens to lower all American's standard of living and make us less secure.

Just a little over 2 years ago, America was energy dominant…for the first time in 70 years. We were the largest energy producer in the world, and fuel for our homes and automobiles was affordable for working Americans.

Unfortunately, the President and the Democratic majorities in the last Congress decided to wage an all-out legislative, regulatory, and public relations campaign to suppress that energy dominance, leading to skyrocketing and unaffordable gasoline, natural gas, and electricity prices for many Americans.

Not just that…but, rather than relying on superior American innovation and ingenuity to solve emissions issues… which we've demonstrated clearly we can do…
this campaign against American energy and energy workers is attempting to cancel proven, increasingly **cleaner** forms of existing energy resources in favor of **only a few** forms of weather-dependent energy sources. And that has serious negative economic and national security implications.

Put simply**, energy** security **is national** security. It takes energy to produce raw materials, to manufacture products, to produce farm products – like produce, eggs and poultry and pork and beef, to get those products to market. In fact, **energy** is at the center of everything.

Americans have seen firsthand…they're living it…that limiting domestic energy production and cheapening the value of the dollar through reckless Federal spending is a textbook way to drive inflation higher.

We can do **better**…we **must** do better.

Now, I'm not reflexively opposed to some of the Democrats' solutions being proposed…like, for example, greater renewables deployment in our country. But, where I struggle is with the practical implementation of these policies and plans…the costs and the potential negative impacts on the quality of life for American consumers.

We can't just take what **sounds** good in town halls in wealthier coastal or metropolitan areas and insist that folks in less wealthy, more rural areas just jump in line and do it as well.

If we want viable, sustainable energy solutions that make **all** Americans secure, that appreciates the diversity of our landscapes, and doesn't rely on premature, aspirational technologies or the availability of mineral supplies from foreign countries being available; then it's time to turn the page on the current, national energy strategy, or lack thereof. Particularly since it's one that makes us more dependent on nations that hate us.

To illustrate the point, I ask my colleagues to consider a recent article in the Washington Post. It suggested senior U.S. military officials are predicting, and preparing for, war within one to five years with China – the very country we depend on for the critical minerals required for many of the "rush to green" solutions.

This is why we need to maximize the production of clean, reliable, affordable American energy and the associated critical materials right here at home…along with improving the permitting process so investors aren't deterred by government imposed barriers and uncertainty for new energy infrastructure projects.

Friends, it's time to get serious about making rolling blackouts on our energy grid a thing of the past…

and lowering gasoline prices with increased American domestic production, rather than being dependent on artificial market interventions by the White House.

More domestic supply is necessary to meet these challenges, and we shouldn't fool ourselves into thinking that draining our strategic petroleum reserve assets is a recipe for success.

We produce energy better, safer, and cleaner than any other place in the world. These facts used to be a source of national strength and pride – not to mention American **international** diplomacy.

We should embrace what we can do and what we are capable of, not demonize our proven successes. And we should encourage free enterprise and free-market-driven innovations to bring out the best, most affordable, and most practical solutions for our economy, our environment, and our national security.

Let me conclude with a hearty welcome to our witnesses today. I appreciate that you're here…and I look forward to you sharing your experience and perspectives with us.

With that, Madame Chair, thank you again for yielding to me. I yield back the balance of any remaining time I have.

Mrs. RODGERS. The Chair recognizes Ranking Member Tonko for 5 minutes.

OPENING STATEMENT OF HON. PAUL TONKO, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK

Mr. TONKO. Thank you, Madam Chair.

And first let me congratulate you on your great achievement and Chair Johnson for his taking on leadership of the Environment Subcommittee.

I have had the privilege of working with the two previous Republican leaders of the subcommittee, Representatives John Shimkus and David McKinley. During that time we certainly had our disagreements, but we also found issues where we could go beyond partisanship and work together for the benefit of our constituents' public health and indeed the environment.

So whether it is drinking water, brownfields, harmful air pollution, or the many other issues under the subcommittee's jurisdiction, I do hope we will be able to find policies where we can work together. And as we begin to consider how our Nation can improve our energy security, foster innovation, and become the global leader in the energy economy of the future, I believe there have been great strides made by Congress in the past several years.

In the 116th and 117th Congresses, this committee played an instrumental role in the development and enactment of several historic energy and environmental laws, including the Energy Act of 2020, the AIM Act to phase down hydrofluorocarbons, the Infrastructure Investment and Jobs Act, and the Inflation Reduction Act.

The IIJA included $62 billion for DOE clean energy investments, including programs that will make our electric grid smarter and more resilient, build a domestic battery manufacturing and recycling supply chain, and support the development of cutting-edge industries through hydrogen and DAC hubs.

The IRA built upon that down payment with nearly $317 billion in funding for DOE, EPA clean energy programs, and expansion and extension of a wide range of tax incentives and other climate and clean energy investments. These efforts took our long-term national energy security seriously, positioning the United States to become the leader in many of the energy technologies and supply chains that will come to dominate the global energy system over the next several decades.

And we are already starting to witness the benefits of this long-term commitment to a clean energy future. More and more private-sector companies are making plans to manufacture and deploy clean-energy technologies across our country. Electric vehicles, semiconductors, solar components, batteries, offshore wind turbines, and electrolyzers are all part of this growing effort to create new industries right here at home.

It has been estimated that the IRA could result in 9 million jobs over the next decade, and many investments will support the deployment of affordable clean-energy solutions resulting in major savings for American consumers.

These economic and job-creation benefits are, of course, only part of the story. There will also be a significant reduction of pollution, which will mean fewer hospital visits and missed days of school and work. Reducing climate and traditional pollution will make us a healthier and more productive society as we continue to fight to avoid the worst potential consequences of global climate change.

But we do know that, even after the IRA and the IIJA, there is still much more work to be done. So, as we consider how to best build upon these historic bills, I would caution that creating loopholes in our Nation's environmental laws for the benefit of polluting industries will not improve our long-term national energy security.

On the contrary, our environmental laws can be a driver of innovation, complementing the investments we have already made to support the development and deployment of next-generation technologies.

I do want to welcome a great public servant to the committee, Dr. Ana Unruh Cohen, who can advise us on how to build upon the progress of the past 4 years. Dr. Unruh Cohen and former Select Committee Chair Kathy Castor played a critical role in the climate and clean-energy successes of the 117th Congress. I can think of no one better to help us understand where we have come from, what we have achieved, and what is left to do to transition our Nation and our planet to a more just and sustainable energy system.

Thank you, Dr. Unruh Cohen, for joining us today.

And, Madam Chair, I want to thank you for making this our first hearing of the new Congress. The American people should know more about the work that has been done to make our country less reliant on economically volatile and polluting industries. And soon we will be able to provide more information to our constituents and local businesses about how to take advantage of the generous tax credits and rebates in the IRA.

So I look forward to having many more opportunities to share that information with the public in the months ahead.

Earlier our past chair, Frank Pallone, acknowledged Rick Kessler for the great work he has done with this committee and certainly with the subcommittee that I chaired.

Rick, I thank you for an outstanding bit of professionalism that you brought to this committee. I thank you for the hard work, the passion, and the success that we have all enjoyed. God bless you as you go forward with your new career opportunities.

And with that, Madam Chair, I yield back.

[The prepared statement of Mr. Tonko follows:]

Committee on Energy and Commerce

Opening Statement as Prepared for Delivery
of
Subcommittee on Environment, Manufacturing, and Critical Minerals Ranking Member
Paul D. Tonko

Hearing on "American Energy Expansion: Strengthening Economic, Environmental, and National Security"

January 31, 2023

Thank you, Madam Chair.

First, I want to congratulate you, as well as Chairman Johnson for taking on leadership of the Environment Subcommittee.

I have had the privilege of working with the two previous Republican leaders of the Subcommittee, John Shimkus and David McKinley.

During that time, we certainly had our disagreements.

But we also found issues where we could go beyond partisanship and work together for the benefit of our constituents' public health and the environment.

So, whether it is drinking water, brownfields, harmful air pollution, or the many other issues under the Subcommittee's jurisdiction, I hope we will be able to find policies where we can work together.

And as we begin to consider how our nation can improve our energy security, foster innovation, and become the global leader in the energy economy of the future, I believe there have been great strides made by Congress in the past several years.

In the 116th and 117th Congresses, this Committee played an instrumental role in the development and enactment of several historic energy and environmental laws, including the Energy Act of 2020, the AIM Act to phasedown hydrofluorocarbons, the Infrastructure Investment and Jobs Act, and the Inflation Reduction Act.

IIJA included $62 billion for DOE clean energy investments, including programs that will make our electric grid smarter and more resilient, build a domestic battery manufacturing and recycling supply chain, and support the development of cutting-edge industries through hydrogen and DAC hubs.

The IRA built upon that down payment with nearly $370 billion in funding for DOE, EPA clean air programs, an expansion and extension of a wide range of tax incentives, and other climate and clean energy investments.

January 31, 2023
Page 2

These efforts took our long-term national energy security seriously, positioning the United States to become the leader in many of the energy technologies and supply chains that will come to dominate the global energy system over the next several decades.

And we are already starting to witness the benefits of this long-term commitment to a clean energy future.

More and more private sector companies are making plans to manufacture and deploy clean energy technologies across the country.

Electric vehicles, semiconductors, solar components, batteries, offshore wind turbines, and electrolyzers are all part of this growing effort to create new industries here at home.

It has been estimated that the IRA could result in 9 million jobs over the next decade.

And many investments will support the deployment of affordable clean energy solutions, resulting in major savings for American consumers.

These economic and job creation benefits are of course only part of the story.

There will also be a significant reduction of pollution, which will mean fewer hospital visits and missed days of school and work.

Reducing climate and traditional pollution will make us a healthier and more productive society as we continue to fight to avoid the worst potential consequences of global climate change.

But we know even after the IRA and IIJA there is still much more work to be done.

So, as we consider how to best build upon these historic bills, I would caution that creating loopholes in our nation's environmental laws for the benefit of polluting industries will not improve our long-term national energy security.

On the contrary, our environmental laws can be a driver of innovation, complementing the investments we have already made to support the development and deployment of next-generation technologies.

I want to welcome a great public servant to the Committee, Dr. Ana Unruh Cohen, who can advise us on how to build upon the progress of the past four years.

Dr. Unruh Cohen and former Select Committee Chairwoman Kathy Castor played a critical role in the climate and clean energy successes of the 117th Congress.

I can think of no one better to help us understand where we have come from, what we have achieved, and what is left to do to transition our nation— and our planet— to a more just and sustainable energy system.

Thank you, Dr. Unruh Cohen for joining us today.

January 31, 2023
Page 3

And Madam Chair, I want to thank you for making this our first hearing of the new Congress.

The American people should know more about the work that has been done to make our country less reliant on economically volatile and polluting industries.

And soon we will be able to provide more information to our constituents and local businesses about how to take advantage of the generous tax credits and rebates in the IRA.

I look forward to having many more opportunities to share that information with the public in the months ahead.

With that, I yield back.

Mrs. RODGERS. Our first witness is the Honorable Paul Dabbar, former—well, he was Under Secretary of the Department of Energy.

And you are recognized for 5 minutes.

STATEMENTS OF PAUL M. DABBAR, FORMER UNDER SECRETARY OF ENERGY; DONNA JACKSON, DIRECTOR OF MEMBERSHIP DEVELOPMENT, PROJECT 21, NATIONAL CENTER FOR PUBLIC POLICY RESEARCH; ANA UNRUH COHEN, PH.D., FORMER MAJORITY STAFF DIRECTOR, HOUSE SELECT COMMITTEE ON THE CLIMATE CRISIS; AND ROBERT MCNALLY, PRESIDENT, RAPIDAN ENERGY GROUP

STATEMENT OF PAUL M. DABBAR

Mr. DABBAR. Chair McMorris Rodgers, Ranking Member Pallone, and members of the committee, I am honored to be again before this committee. I was with the chair last in Washington State a couple of years ago as we were making good environmental progress adjacent to her district.

Not so long ago, under the leadership of Secretaries Perry, Brouillette, the U.S. became the undisputed dominant country in energy. When I was Under Secretary in 2017, crude oil exports jumped from zero to 1 million barrels a day. We were amazed by the jump.

By 2019, exports had jumped to 3 million barrels a day. That year, for the first time since the 1950s, we went from the largest energy importer in the world to a net energy exporter.

The Jimmy Carter founding mission for DOE had finally been achieved, and the U.S. became the undisputed dominant country in energy. We became the number-one producer of crude oil in the world, increasing from a low of 4.8 million barrels a day to 12.9, a monumental jump. We became the number-one global producer of natural gas. We became the marginal producer and the global price setter of crude oil, taking the crown from OPEC.

We extended our lead as a top country in the discovery of new energy technologies, including solar, lithium ion chemistry, and new drilling technologies. We were a solid manufacturer, including for turbines, nuclear, electric vehicles, and drilling.

We allowed the country to build, whether it was wind, batteries, LNG, or pipelines. This resulted in energy price deflation, and the U.S. led the world in the reduction of tons of emissions. No other country came close to that combination—production, technology, and manufacturing—not China, not Russia, and not Saudi Arabia.

This dramatic turn in energy posture not only created economic growth and security, it produced a new foreign policy playing field, and we were no longer at the bidding of a cartel.

This allowed us to take the lead in stabilizing the global energy markets when COVID hit. We were so strong that the 2020 OPEC production agreement was announced from the White House. That was energy dominance.

We did this by concurrently focusing on all-the-above energy policies, increasing all-the-above energy supply, strengthening energy national security and diplomatic posture, producing energy price deflation, and reducing emissions.

This shift happened for three reasons: U.S. energy technology innovation, government policies that encouraged all-the-above energy supply, and investment by the private markets.

The trigger was a vast amount of energy innovation technologies. Much of which is now being deployed did not exist 20 years ago. Then this committee, in a bipartisan and after many years of negotiations, passed several acts that made a big difference. Those E&C compromises I can summarize as, "If you give me my pro supply policies, I will give you your pro supply policies." But this balanced approach has taken a detour, and we are now back to asking Riyadh, Caracas, and Tehran for their help.

Here are the steps the committee can take to establish an energy dominance: Require agencies such as Interior, EPA, and FERC to permit, license, and approve all-the-above energy types. FERC needs significant legislative reform, including a reform of the Federal Power Act and the Natural Gas Act, to make them do their statutory obligation to ensure that there is enough energy supply. They need to be required to approve transmission projects for all types of energy, and they need to radically overall ISO rules that encourage baseload that is being shut down faster than intermittent is being built.

Capital providers needs to be pushed so that investment criteria is not all about ESG and that they should also care about prices, reliability, national security, and supply chain versus supporting energy production moving overseas, the autocratic regimes, including one using slave labor. That does not seem very ESG to me.

And we need to continue to support discovery, science, and innovation, a leading strength of America.

Our moment of energy dominance was a culmination of many factors: innovation, all-the-above pro-supply set of policies, markets willing to invest, and strong energy diplomacy.

As we confront the challenges of the energy markets today, we do well to remember the ingredients that made us so successful not so long ago.

[The prepared statement of Mr. Dabbar follows:]

STATEMENT BY

THE HONORABLE PAUL M. DABBAR

FORMER UNDER SECRETARY

U.S. DEPARTMENT OF ENERGY

CEO, BOHR QUANTUM TECHNOLOGY

DISTINGUISHED VISITING FELLOW, COLUMBIA UNIVERSITY

CONTRIBUTOR, WALL STREET JOURNAL

BEFORE THE HOUSE ENERGY AND COMMERCE COMMITTEE

ON AMERICAN ENERGY EXPANSION: STREGTHENING ECONOMIC, ENVIRONMENTAL, AND NATIONAL SECURITY

JANUARY 31, 2023

Chair McMorris Rodgers, Ranking Member Pallone, and Members of the Committee, I am honored to again be before this Committee. I was with the chair last in Washington state a couple of years ago where we were making strong environmental progress near your district.

Not so long ago, under the leadership of Secretaries Perry and Brouillette, the U.S. became the undisputed dominate country in energy. When I was Under Secretary in 2017, US crude exports jumped from zero to 1mm bbl/d. We were amazed by the leap. By 2019, exports jumped to 3mm bbl/d. And that year, for the first time since the 1950's, we went from the largest energy importer, to a net energy exporter. The Jimmy Carter founding mission for DOE had finally been achieved, and the U.S. became the undisputed dominate country in energy.

We became the #1 producer of oil as crude production increased from a low of 4.8 to 12.9 mm bbl/d, a monumental increase. We also became the #1 global producer of natural gas. We became the marginal producer and global price setter of crude oil, taking the crown from OPEC. We extended our lead as the top country in discovery of new energy technologies, including solar, lithium-ion chemistry, and new drilling technologies. We were a solid manufacturer including for turbines, nuclear, EV's and drilling. We allowed the country to build, whether it was wind, batteries, LNG, or pipelines. This resulted in energy price deflation. And the U.S. led the world in the reduction of tons of emissions.

No other country came close to that combination: production, technology and manufacturing, not China, Russia or Saudi Arabia. This dramatic turn in energy posture not only created significant economic growth and security, it produced a new foreign-policy playing field and we were no longer at the bidding of a cartel.

This allowed us to take the lead on stabilizing global energy markets when Covid hit. We were so strong, that the 2020 OPEC production agreement was announced from the White House. That was energy dominance.

We did this by concurrently focusing on all the "All the above energy policies": increasing all the above energy supply, strengthening energy national security and diplomatic posture, producing energy price deflation, and reducing emissions.

This shift happened for three reasons: U.S. energy-technology innovation, government policies that encouraged all-the-above energy supply, and investment by private markets.

The trigger was a vast amount of innovation of new technologies, and much of what is now being deployed did not exist in commercial form twenty years ago. Then this committee, bi-partisan, and after many years of negotiation, passed several Acts that made a big difference. Those E&C compromises can be summarized: If you give me my pro-supply policies, I'll give you your pro supply policies.

But this balanced approach has taken a detour. And we are now back to asking Riyad, Caracas and Tehran for their help.

Here are steps this committee can take to re-establish energy dominance:

- Require agencies such as Interior, EPA and FERC to permit, license, and approve all the above energy types.
- FERC needs significant legislative reform to make them do their statutory obligation to ensure there is enough energy supply of all types. They need to be required approve transmission projects for all types of energy. And they need to radically overhaul ISO rules to encourage baseload power, that is being shut down faster than new intermittent plants are being built.
- Capital providers need to be pushed so that investing criteria is not all about ESG, that it includes caring about prices, reliability, and national security & supply chain risks. Vs supporting energy production moving overseas to autocratic regimes including one using slave labor camps. That doesn't seem very ESG to me.
- And continue to support discovery science and innovation, a leading strength of America.

Our moment of energy dominance was the culmination of many factors: innovation, an all-the-above pro-supply set of policies, markets willing to invest and strong energy diplomacy. As we confront the challenges in energy markets today, we'd do well to re-implement the ingredients that made us so successful not so long ago.

Mrs. RODGERS. Thank you.

Thank you for your testimony.

Our next witness is Ms. Donna Jackson with the National Center for Public Policy Research, Project 21.

You are recognized for 5 minutes.

STATEMENT OF DONNA JACKSON

Ms. JACKSON. Chair Rodgers, Ranking Member Pallone, and members of this committee, I thank you for allowing me to testify today. My name is Donna Jackson. I am the director of membership development for Project 21, a Black leadership network of the National Center for Public Policy Research.

Project 21 is one of the oldest and largest Black conservative think tanks in the country. Our hundreds of members come from all walks of life, from small business owners, law enforcement, healthcare workers, teachers, energy industry workers, clergy, healthcare workers, both professional and nonprofessional. Most of us are not career activists, lawyers, or lobbyists, and more than a few of us actually live in the communities that we hope to improve.

I applaud this committee for kicking off a new session of Congress by looking at increasing domestic energy supply and reducing energy costs. Needless to say, these costs are tough enough on the middle class, but they are even tougher on folks struggling to reach the middle class. In fact, they are actually harder than you may think.

The U.S. Energy and Information Administration had some very useful statistics. It talked about the problems that Americans have in paying their energy bills. One-third struggle to pay their energy bills. A fifth of them have to forego necessities. But, of course, these numbers are double, nearly double for minority communities. And this report was actually a couple of years old. So added inflation makes it even that much harder.

But perhaps even more damaging is their immediate difficulty of paying for sky-high energy bills, making it from paycheck to paycheck, and the long-term barriers to upward mobility and achieving a piece of the American dream. In so many ways, it is painful and unaffordable. Domestic energy is part of the ticket out of poverty. And we have so much of it, so much of it.

For example, we see the entrepreneur spirit of the Black community. In many Black-owned businesses, small-owned businesses, these businesses are struggling and failing under the weight of high energy costs. And they also have regulatory compliances that they barely can afford. And it is disproportionately impacting small businesses that really want to make it in this country.

It all adds up to a regressive tax on those seeking to better themselves, their families, and their communities by owning and operating their own businesses.

Unaffordable energy means less—means the individuals have less to spend on necessities. The industrial employment has historically led to the emergence of a vibrant Black middle class. But what we are seeing is these energy costs are destroying these high-paying gateway jobs for low-income and minority communities. And we have very few options to earn money to be able to make it into the middle class.

The energy industry itself represents a very reliable source of well-paying jobs for people that don't have the options of being able to participate in the keyboard industry. And, yet, we are destroying those options for these individuals who have the American spirit, who want to do better, want to be self-reliant and not dependent on government assistance. We should not be making minority and low-income individuals an afterthought in saving this planet. Their lives matter. Our lives matter.

And I applaud you that you are considering the fact of the hardships that unaffordable energy poses to people like me who have self-esteem, self-respect, and we want to be a part of this great American experience.

Thank you.

[The prepared statement of Ms. Jackson follows:]

NATIONAL CENTER
FOR PUBLIC POLICY RESEARCH

House Committee on Energy and Commerce
Hearing on "American Energy Expansion: Strengthening Economic, Environmental, and National Security"

January 31, 2023

Remarks of Donna Jackson, Director of Membership Development, Project 21

Chair Rodgers, ranking member Pallone and members of this Committee, thank you for allowing me to testify today. My name is Donna Jackson, and I am the Director of Membership Development for Project 21 – the black leadership network of the National Center for Public Policy Research. Project 21 is one of the oldest and largest black conservative think tanks in the country. Our hundreds of members come from all walks of life, from small business owners to law enforcement to teachers to energy industry workers to clergy to health care workers -- both professionals and non-professionals. Most of us are not career activists, lawyers, or lobbyists and more than a few of us actually live in the communities we hope to improve.

I applaud this Committee for kicking off the new session of Congress by looking at increasing domestic energy supplies and reducing energy costs. Needless to say, these costs are tough enough on the middle class, but they are even harder on those still struggling to reach the middle class. In fact, it may be worse than you think.

The U.S. Energy Information Administration has some very useful statistics on the problem. For example, it found that nearly one-third of households struggle to pay their energy bills, and that one in five report having to reduce or forego necessities like food or medicine in order to pay an energy bill. And of course, these numbers are nearly double for low-income and minority households. Also note that this study is several years old and does not reflect the much higher energy prices we have experienced during the Biden Administration.

But perhaps even more damaging than the immediate difficulties of paying sky-high energy bills and making it to the next paycheck are the long-term barriers to upward mobility and achieving a piece of the American dream. In so many ways, plentiful and affordable domestic energy is part of the ticket out of poverty and dependence.

For example, we see the entrepreneurial spirit of the black community in many black-owned small businesses, but those businesses struggle and sometimes fail under the weight of high energy costs. And expensive energy comes on top of other regulatory compliance costs that the Small Business Administration has shown to have disproportionate impacts on small businesses. It all adds up to a regressive tax on those seeking to better themselves, their families, and their communities by owning and operating their own businesses.

Unaffordable energy also means less of the industrial employment that has historically led to the emergence of a vibrant black middle class. Without these high paying blue-collar gateway jobs, low-income and minority communities have fewer options to earn what is needed for home ownership and decreasing the wealth gap.

In addition, the energy industry itself is a source of many well-paying jobs, and in fact Bobby Rush and others on this Committee helped enact job training programs so that more minorities could take advantage of the opportunities created by the shale revolution. But there will be far fewer such opportunities if the President makes good on his promises to kill off the American oil and natural gas sector.

And perhaps most importantly, every extra penny struggling households must spend on expensive energy is a penny we can't save for home ownership or our children's education or retirement savings as well as other things that build family wealth and help lift up the next generation.

Let me conclude by telling you what the black community does not want – and that's climate change policies and environmental justice initiatives that take us in exactly the wrong direction by blocking domestic sources of energy, raising costs, destroying jobs and stifling our pursuit of the American dream. I believe that energy affordability should always come first, and that's a message the black community wants to hear from Congress. Thank you.

Mrs. RODGERS. Thank you for your testimony.

Next we will hear from Dr. Ana Unruh Cohen, former majority staff director of the U.S. House Select Committee on Climate.

You are recognized for 5 minutes.

STATEMENT OF ANA UNRUH COHEN, PH.D.

Dr. UNRUH COHEN. Good morning, Chair Rodgers, Ranking Member Pallone, and the members of the committee.

I am Ana Unruh Cohen, and I most recently served as a majority staff director for the Select Committee on the Climate Crisis.

For a climate scientist turned congressional staffer, it will be hard to stop serving as staff director for the select committee during the last 4 years under the leadership of Representative Kathy Castor and with other members of this committee while Congress passed the most consequential climate and clean energy laws in U.S. history.

The last 4 years have underscored how energy, climate, and economic security are tied together. Between the economic impact of prevaccine COVID lockdowns, ongoing supply-chain disruptions, Russia's invasion of Ukraine, and extreme weather events, it has become clearer than ever that the United States needs to invest in building an energy economy that meets the needs of the 21st century. To thrive we will need affordable energy that addresses the climate crisis, improves public health, and reduces our reliance on volatile global powers and their resources.

The legislation enacted in the 116th and 117th Congresses, especially the Infrastructure Investment and Jobs Act, the Inflation Reduction Act, and the CHIPS and Science Act, make critical down payments on achieving those goals. We are already seeing the benefits of these laws accrue across America.

Since the enactment of the IRA in August of 2022, almost $90 billion in clean energy projects have been announced, initiating new economic development opportunities across the country, and we will see even more in the coming years.

The need for the clean energy transition is clear and growing in urgency. The United States faced $35 billion extreme weather in climate-related disasters in 2021 and 2022, with a cumulative price tag of more than $180 billion in direct economic losses alone.

Other countries around the world have faced devastating heatwaves, droughts, and floods in recent years. Without comprehensive climate action, the science points toward continued disasters with regional, national, and global consequences.

The climate crisis and need for energy security will require governments at all levels to increase their engagement on energy and climate policies, to realize the potential created by the news laws, and to use the available tools to ease impacts on family when new climate and energy challenges arise.

Congress, and especially this committee, will need to understand and respond to the increasingly dynamic global energy landscape to maintain U.S. global leadership and competitiveness.

Successful energy and climate legislation must meet the test of cutting climate pollution guided by science, reducing energy costs on families, advancing equity and justice, and creating good, family-sustaining jobs. As this committee takes up energy and climate legislation, Members should evaluate the bills with these metrics in mind, just as we did at the select committee and working with the standing committees in the 116th and 117th Congress. My written testimony summarizes many of the accomplishments of those laws.

My testimony also summarizes the current global energy investment landscape as countries ramp up climate action. But climate considerations are not the only driving force behind increased interests in clean energy. Just yesterday BP's chief global economist pointed to the Russian invasion as a reason that countries are seeking to increase access to domestically produced energy, most of which he said will likely come from renewables and other nonfossil fuels.

As we have heard, China is leading that clean energy race, and we must catch up. They may be out front now, but the United States can close the gap to power America in ways that improve our global competitiveness and help solve the climate crisis.

American ingenuity is our superpower. Giving up on a technological competition is not the American way. Instead, we need energy and climate solutions that meet the needs of the 21st century, and we need them now.

I will close on a personal note. Many of you who know me from DC may not know that I was born and raised in Corpus Christi, Texas, or that my dad spent his career in the chemical industry, and my brother currently works in safety operations for oil and gas.

I am well acquainted with the challenges that communities face in balancing energy production and public health, and I know we can do it in a way that—find a way forward for a clean energy future that works for everyone and doesn't pit public health against economic security.

Thank you.

[The prepared statement of Dr. Unruh Cohen follows:]

Testimony before the U.S. House Energy and Commerce Committee
"American Energy Expansion: Strengthening Economic, Environmental, and National Security"
January 31, 2023

Ana Unruh Cohen, PhD

Good morning, Chair Rodgers, Ranking Member Pallone and the Members of the committee. I am Ana Unruh Cohen and I most recently served as the Majority staff director for the Select Committee on the Climate Crisis. I came to DC in August 2001 with a freshly minted doctorate in Earth Science. I was eager to explore how a climate scientist could contribute to national policy and have subsequently worked in some form on every major energy and climate legislation that Congress has considered during that time. The highlight of my career was serving as staff director for the Select Committee during the last four years under the leadership of Rep. Kathy Castor and with other Members of this committee.

The last four years were also tumultuous for global energy markets and consequential for climate policy. Between the economic impact of pre-vaccine Covid lockdowns, ongoing supply chain disruptions, Russia's invasion of Ukraine, and extreme weather events, it's become clearer than ever that the United States needs to invest in building an energy economy that meets the needs of the 21st century. The tools we have for meeting these challenges have also changed during the last decade. The cost of solar, wind, batteries and other renewable technologies have plummeted even as U.S. shale development has influenced global oil and methane markets. To thrive we will need affordable energy that address the climate crisis, improves public health, and reduces our reliance on volatile global powers and their resources.

The legislation enacted in the 116th and 117th Congresses, especially the Infrastructure Investment and Jobs Act (IIJA), the Inflation Reduction Act (IRA), and the CHIPS and Science Act, make critical down payments on achieving those goals. We are already seeing the benefits of these laws accrue across America and we will see even more in the coming years as we accelerate our transition to a net-zero emission, clean energy economy.

The need for the clean energy transition is clear and growing in urgency. The United States faced 35 "billion-dollar" extreme weather and climate-related disaster events in 2021 and 2022, with a cumulative price tag of more than $180 billion in direct economic losses alone.[1] Other countries around the world have also faced devasting heatwaves, droughts and floods in recent years. Without action, the science points toward continued global catastrophe. In fact, the

[1] National Centers for Environmental Information, "Summary Stats | Billion-Dollar Weather and Climate Disasters," *National Oceanic and Atmospheric Administration*, 2022.

United Nations Secretary General Antonio Guterres referred to the IPCC Sixth Assessment Report as a "code red for humanity," pointing to its dire findings on some of the irreversible trends set in motion by climate change.[2] However, the IPCC also concluded that it is still technologically possible to halve global climate pollution by 2030 and warned that global climate pollution must peak by 2025 in order to avoid the worst devastation.[3]

The transition to a net-zero emission economy will require governments at all levels to increase their engagement on energy and climate policies to realize the potential created by recent legislation and to use the available tools to ease impacts on families when new climate and energy challenges arise. Congress, and especially this committee, will need to understand and respond to the increasingly dynamic global energy landscape to maintain U.S. global leadership and competitiveness.

Energy and climate are inextricably linked

Every energy decision has implications for the climate system. Every energy decision impacts the amount of heat-trapping pollution in the atmosphere. We are already experiencing the consequences of the ~1°C increase in global temperatures –largely from burning fossil fuels—and the increasing risks to health, the economy and national security. Based on the extensive collection of scientific and economic research, the Council of Economic Advisors noted that:

> A growing literature suggests that as temperatures and sea levels rise, and extreme weather becomes more common, the physical damages that stem from the warming of the planet will have substantial, adverse effects on macroeconomic outcomes at the local, national, and international levels. Though not all caused by climate change, across the United States, estimated damages from storms, floods, wildfires, and other extreme weather events have grown to about $120 billion a year from 2016-2020. Climate-driven extreme events can also result in cascading damages to critical and interconnected systems such as energy, public health, ecosystems, water, and food. These damages have a variety of effects on the economy, including but not limited to straining government budgets, changing asset values and insurance costs, and shifting migration patterns and labor supply. The economic effects vary across U.S. regions and industries and will likely disproportionately harm disadvantaged communities.[4]

The energy sector has also experienced the impacts of extreme weather and other consequences of the climate crisis. In recent years, electricity failures have occurred from

---

[2] United Nations, "IPCC report: 'Code red' for human driven global heating, warns UN chief," *UN News,* August 9, 2021.

[3] IPCC, "Climate Change 2022: Mitigation of Climate Change," 2022.

[4] Council of Economic Advisers, "Climate-related Macroeconomic Risks and Opportunities," April 4, 2022, pg 3-4.

extreme temperatures – both heat and cold – and from destruction from wildfires and storms. The water cycle is incredibly sensitive to climate change leading to challenges for water used in energy production, cooling of thermal electricity generation and hydropower. Rising sea levels puts coastal energy facilities at risk to flooding even as increasing temperatures contribute to the severity of storms. Extreme rainfall events increase the risk of flooding and failures at energy waste facilities across America. As in the rest of society and the economy, the climate crisis is exposing and exacerbating vulnerabilities in the energy sector and underscoring the need for change.

Government and private investments are also responding to the climate crisis and the need for climate pollution to peak in the next few years and then reduce to achieve a net-zero emissions by mid-century, if not sooner. For the first time in 2022, investments in the clean energy transition reached the same level as fossil fuel investments at $1.1 trillion.[5] Despite reaching this level, the clean energy transition needs three times this level of investment for the rest of the decade to achieve transition to a net-zero economy according to analysis by Bloomberg NEF. BP's annual energy outlook also found that governments and industries are behind in the transition to net-zero emissions by 2050.[6]

Climate considerations are not the only driving force behind increased interest in clean energy. The Russian invasion of Ukraine has refocused attention on energy security, especially ways to meet their energy needs with domestic resources. According to BP's chief economist, "The increased focus on energy security as a result of the Russia-Ukraine war has the potential to accelerate the energy transition as countries seek to increase access to domestically produced energy, much of which is likely to come from renewables and other non-fossil fuels."[7] The importance of leadership in clean energy technologies and investments will only grow in the coming years.

China already has a head start on the rest of the world in clean energy investments. Just less than half of the global energy transition funding in 2022 comes from China's $546 billion spending. The United States trails in a very distant second place with $141 billion.[8] U.S. investments will ramp up in the coming years as recently enacted laws unleash new federal funding that will leverage additional private capital. While China may be out front now, the United States can, and must, close that gap to power America in ways that improve our global

[5] BloombergNEF, "Energy Transition Investment Trends 2023," January 2023.
[6] Tom Wilson, "BP cuts long term forecast for oil and gas demand," *The Financial Times*, January 30, 2023.
[7] Ron Bousso, "Ukraine war to accelerate shift to clean energy, BP says," *Reuters*, January 30, 2023.
[8] BloombergNEF, "Energy Transition Investment Trends 2023," January 2023.

competitiveness, help solve the climate crisis, and strengthen our partnerships with other countries to do the same.

In making the clean energy transition, we also have the opportunity to overcome environmental harms of the past. While the consequences of the climate crisis affect us all, it does not affect us all equally. Increasingly environmental justice is a cornerstone of environmental and climate policies to integrated equity and environmental justice into building a cleaner and more resilient economy. Legislation enacted in the 117th Congress reflected this growing emphasis. In addition, the Biden-Harris Administration is prioritizing environmental justice through the Justice40 Initiative and is taking steps to "narrow the racial wealth gap" by supporting underserved entrepreneurs and small businesses in federal procurement.[9]

Successful energy and climate legislations must meet the tests of cutting climate pollution guided by science, reducing energy costs on families, advancing equity and justice, and creating good, family-sustaining jobs. As this committee takes up energy and climate legislation, Members should evaluate the bills with these metrics in mind as we did at the Select Committee in working with the standing committees in the 116th and 117th Congresses.

Climate and clean energy accomplishments in the 116th and 117th Congresses

During the last four years, Congress has produced legislation to set the United States on the path towards solving the climate crisis by passing policies to significantly cut climate pollution, help our communities adapt to its effects, and make them more resilient to its consequences. These climate and clean energy investments will also advance cleaner, cheaper energy generation that enhances America's energy security and global competitiveness. While the 116th Congress enacted some important legislation, especially the energy-related provisions of the 2020 year-end omnibus legislation, the 117th Congress seized the opportunity for transformational action and passed three pieces of legislation that will guide climate action for the next decade: the Infrastructure Investment and Jobs Act (IIJA), the Inflation Reduction Act (IRA), and the CHIPS and Science Act. All told, these policies will reduce heat-trapping pollution in a way that creates good-paying American jobs, bolsters domestic manufacturing of clean technologies, reduces energy costs for families and businesses, invests in historically disadvantaged communities, and firmly positions the United States to remain the global leader in clean technologies of the 21st century.

The majority staff of the Select Committee on the Climate Crisis summarized the climate and clean energy legislative accomplishments of the 116th and 117th Congresses in the December

[9] The White House, "FACT SHEET: Biden-Harris Administration Advances Equity And Economic Opportunity Through Federal Procurement And State And Local Infrastructure Contracting," July 6, 2022.

2022 majority staff report "Solving the Climate Crisis 2022: Key Accomplishments and Additional Opportunities."[10] Below are brief summaries of four of the bills:

2020 Omnibus
The 2020 year-end omnibus legislation helped advance climate solutions and clean energy research, invested in our nation's resilience, and used America's technological leadership to expand opportunities for all Americans. The legislation included support for energy and environmental innovation, clean energy tax extensions, pipeline safety, and water infrastructure. Notably the legislation directed the Environmental Protection Agency (EPA) to phase down the production and consumption of heat-trapping hydrofluorocarbons (HFCs) which, along with the Senate's ratification of the Kigali Amendment to the Montreal Protocol, will enable the United States to lead global efforts to avoid increasing global temperatures by up to 0.5°C.

Infrastructure Investment and Jobs Act
The 2021 Infrastructure Investment and Jobs Act (IIJA) included historic investments to strengthen our nation's core infrastructure for transportation, water supply, and electric grid resilience and modernization. It also provided major investments in energy efficiency, advanced environmental justice by remediating legacy pollution, and prepared communities for costly weather disasters. These investments include the largest investment ever in public transit, broadband to expand access for low-income American families, clean electric school and transit buses and a nationwide electric vehicle charging network. The IIJA also supported projects to reduce flood and wildfire threats to communities, including strengthening housing, public buildings, and infrastructure against climate-fueled extreme weather.

The CHIPs and Science Act
The CHIPS and Science Act authorized critical investments in American innovation and workforce development by advancing research to expand clean energy, modernize the grid, develop carbon removal and clean industrial technologies, and advance the fields of climate science, clean water systems, and critical minerals. The CHIPS and Science Act also benefits environmental justice communities, with investments to build regional technology hubs, expand grants to economically-distressed communities and labor markets, and diversify the STEM workforce. The investments included for semiconductor chips will support the American-led development of increasingly essential components of electric vehicles, building electrification, renewable energy, and electric transmission technologies.

The Inflation Reduction Act

[10] Select Committee on the Climate Crisis majority staff, "Solving the Climate Crisis 2022: Key Accomplishments and Additional Opportunities," December 2022.

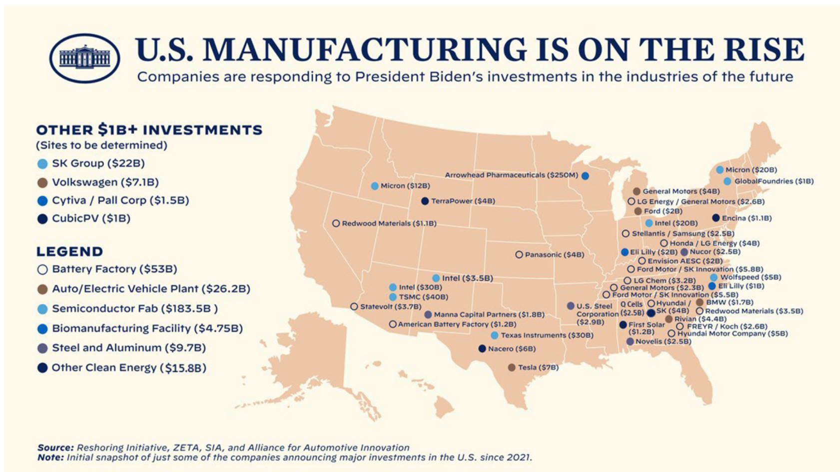
The Inflation Reduction Act (IRA) is the largest climate and clean energy investment in U.S. history, including roughly $370 billion to expand access to cleaner, cheaper energy and cost-saving technologies that will help reduce pollution, boost resilience across America, ensure environmental justice for vulnerable communities, address the national security threats posed by extreme weather, and meet our climate goals. In addition to lowering energy costs and creating jobs, the IRA is expected to help put the nation on a path to reducing harmful carbon pollution by as much as 42% by 2030. The IRA will:

- Deploy cheaper, clean energy faster and support energy efficiency upgrades and clean electrification to American families and businesses to help save money on their energy bills;
- Help deploy cheaper, cleaner vehicles through tax credits for electric vehicles, and enhance transportation resilience, equity, and sustainability;
- Create millions of good-paying jobs, develop the workforce, and promote economic development, along with continued development of strong domestic supply chains for clean energy technologies;
- Reduce climate pollution from our industrial sector and tackle releases of potent heat-trapping pollutants like methane;
- Focus investments into disadvantaged communities to combat environmental injustice and empower communities across the United States to ensure that they share in the benefits of the transition to a clean economy;
- Provide billions of dollars for conservation, restoration, and resilience projects on public and private lands, including working lands, to promote healthy environments that provide clean air and water, food, jobs, and store climate pollutants;
- Strengthen community and infrastructure resilience, including investments to help rural communities and tribes build resilience and adapt to unavoidable climate impacts; increase the resilience and reliability of the electricity grid; improve energy and water efficiency and resilience for affordable housing; and increase the resilience and capacity of coastal and marine habitats to withstand weather events;
- Advance renewable energy development and ensure oil and gas companies pay their fair share for extraction activities on public lands and waters; and
- Bolster advancements in climate and weather research and clean technology innovation.

In addition to the laws summarized above, the 116th and 117th Congresses also took other important conservation, environmental justice, climate and clean energy actions through the enactment of additional legislation, including the Great American Outdoors Act, the American Rescue Plan, and the annual National Defense Authorization Acts and appropriations acts.

The benefits of these climate and clean energy investments are arriving now with more anticipated in the future

By the second anniversary of President Biden's inauguration, companies had announced $300 billion investments in innovative technologies from biomanufacturing to batteries and semiconductors to solar.[11] Since the enactment of the IRA in August 2022, $89.5 billion in clean energy projects alone have been announced, initiating new economic development opportunities across the country.[12] Companies are already responding to the changing U.S. clean energy investment and demand landscape especially for globally competitive technologies like solar, batteries and electric vehicles.[13]



As the initiatives from the IIJA, IRA and CHIPs and Science Act ramp up, these investments and subsequent economic development will continue to grow. Various analyses suggest that additional jobs, health benefits and cost savings will come from the IRA, including the following:

- The BlueGreen Alliance and the University of Massachusetts Amherst Political Economy Research Institute found that the IRA would create more than 9 million good jobs over

[11] Brian Deese, "The Biden Economic Agenda, Two Years In," January 20, 2023.
[12] Personal calculation based on Clean Energy Project Tracker, accessed on January 29, 2023.
[13] Kelsey Tamborrino and Josh Siegel, "Big winners from Biden's climate law: Republicans who voted against it," *Politico*, January 23, 2023.

the next decade in clean energy, manufacturing, and transportation as well as building efficiency, environmental justice and natural infrastructure.[14]

- According to Energy Innovation, the IRA "could lead to between 3,700 to 3,900 avoided deaths in 2030, in addition to 99,000 to 100,000 avoided asthma attacks, and 405,000 to 417,000 avoided lost workdays … As a percentage decrease, avoided deaths are concentrated in communities of color … and on balance, the bill's provisions reduce health burdens more in communities of color."[15]

- The Princeton University-led REPEAT Project found that the IRA would lower annual U.S. energy expenditures overall by at least 4% in 2030, equal to nearly $50 billion per year in savings for households, businesses, and industry.[16] U.S. households in particular would save hundreds of dollars annually on energy costs.

- The Rhodium Group estimated that due to lower electricity rates, lower fuel costs, and greater use of energy efficiency, household energy costs will decline by $717 - $1,146 in 2030, including electricity bills, home heating fuel bills, and transportation fuel costs.[17]

- Resources for the Future (RFF) estimated that the IRA will help reduce retail costs of electricity by 5.2-6.7%, generating aggregate savings of $209 - $278 billion, and helping the average U.S. household save roughly $170 - $220 each year from lower electric bills and lower costs for goods and services over the next decade.[18] RFF expects that the IRA's deflationary impacts on electricity prices will begin quickly – as soon as 2023. RFF also estimated that the IRA will help protect ratepayers from volatility in natural gas prices.

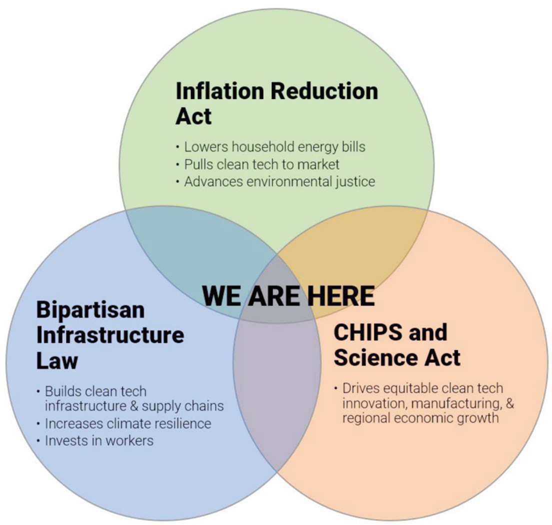
- Rewiring America also published an analysis of the community and household benefits available by congressional district.[19] All 120.7 million households in the United States are eligible for an average of $5,739 in tax credits and an average of $367 in rebates.

---

[14] BlueGreen Alliance, 9 million Jobs from Climate Action: The Inflation Reduction Act (Aug. 2022).
[15] Energy Innovation, "Modeling the Inflation Reduction Act Using the Energy Policy Simulator," August 2022.
[16] Jesse Jenkins, Erin Mayfield, Jamil Farbes, Ryan Jones, Neha Patankar, Qingyu Xu, and Greg Schively, Preliminary Report: The Climate and Energy Impacts of the Inflation Reduction Act of 2022, REPEAT Project, (Aug. 4, 2022).
[17] John Larsen, Ben King, Hannah Kolus, Naveen Dasari, Galen Hiltbrand, and Whitney Herndon, A Turning Point for U.S. Climate Progress: Assessing the Climate and Clean Energy Provisions in the Inflation Reduction Act (Rhodium Group, Aug. 12, 2022).
[18] Nicholas Roy, Dallas Burtraw, and Kevin Rennert, Retail Electricity Rates Under the Inflation Reduction Act Of 2022 (Resources for the Future, Aug. 2022).
[19] Rewiring America, The IRA will deliver huge savings: If we maximize its electric potential for our communities and households, September 13, 2022.

> Since they have triple the energy burden (the portion of their income spent on home energy) as other households, the 53 million low- and moderate-income households in the United States will greatly benefit from being eligible for an average of $10,377 in rebates through the IRA.

As encouraging as these analyses already are, the ultimate benefits may be even greater as the IRA works in conjunction with the IIJA and the CHIPs and Science Act. The history of past technical change suggests that to enable successful, ongoing innovation, governments must invest in R&D to push development of new technologies and couple those with demand policies to pull them to deployment.[20] The IIJA, the IRA and the CHIPs and Science Act provides this push-pull combination for clean energy as illustrated in this graphic by Dr. Constantine Samaras and America will reap the benefits for years to come.[21]



Solving the climate crisis

Building on the achievements of the 116th and 117th Congresses, there is still more to do to fully address the climate crisis. Foremost is the need for implementation of the legislation that was enacted. This requires concerted effort from the Biden-Harris administration in partnership

[20] Vicki Norberg-Bohm, "Creating Incentives for Environmentally Enhancing Technological Change: Lessons From 30 Years of U.S. Energy Technology Policy," *Technological Forecasting and Social Change*, 2000.
[21] Costa Samaras, available at https://twitter.com/CostaSamaras46/status/1616631930274865152.

with state, local, and tribal governments as well as businesses, investors, civil society and individuals taking advantage of the tax credits and programs that will support energy efficiency and clean energy deployment. In addition, the Biden-Harris administration is developing a number of standards and safeguards that will work in tandem with the recent laws to achieve further climate pollution reductions. These are crucial to meeting the climate and clean energy goals that President Biden has set.

Congress should also consider further appropriations and legislation to drive the transition to a clean energy economy that supports a healthy, resilient and just America. The 2022 Select Committee majority staff report highlighted additional opportunities for future Congresses to address the climate crisis,[22] including the need for:

- A comprehensive transmission strategy to meet the increased electric load from electrification of vehicles, buildings, and industrial processes;
- A Clean Electricity Standard, Zero Emission Vehicle sales standards, and other sector-specific standards to provide certainty for investments in pollution reduction;
- A comprehensive approach to critical minerals sourcing and recycling, including updating outdated mining laws to ensure critical minerals are secured in an environmentally, economically, and socially responsible way;
- Continued investments in research for hard-to-decarbonize sectors like off-road transportation and industry, and for carbon removal;
- Improving community engagement in the permitting process, addressing the cumulative impacts of plastic production and disposal in fenceline communities, and supporting efforts to strengthen the environmental justice focus of agencies;
- Increasing support for workforce development and communities experiencing energy transitions, including through registered apprenticeships and a reimagined Civilian Conservation Corps, and ensuring all workers are protected by securing strong labor standards, especially during any extreme weather conditions or events;
- A National Adaptation and Resilience Plan, including strategies to advance climate science and tools, expand technical assistance to improve planning and access to federal programs, and prioritize investments in environmental justice communities;
- Advancing resilience-based codes and standards against rising flood, wildfire, and extreme weather risks, and accelerating disaster recovery and bridging the resilience and protection gap for communities at greatest risk;

[22] Select Committee on the Climate Crisis, "Select Committee Democrats Release Final Report on Key Accomplishments, Additional Opportunities," December 14, 2022.

- Implementing nature-based solutions on public, private, and working lands and waters, enshrining climate mitigation and adaptation in federal natural resource and land management, and protecting and conserving at least 30% of lands and waters;
- Increasing research on climate and public health impacts, prioritizing health equity in federal planning for climate impacts on the healthcare sector and public health, recognizing the disproportionate burden on disadvantaged communities; and ensuring all health sector infrastructure is resilient to the impacts of climate change;
- Fulfilling our commitments to mobilize climate finance for developing countries, and expanding diplomatic, humanitarian, and military capacity to address climate issues; and
- Embedding climate considerations into all facets of national security and defense policy, including acquisitions, vehicles, technologies, construction, and other approaches.

Mrs. RODGERS. My favorite line is "American ingenuity is our superpower."

Next let's turn to our final witness, Mr. Robert McNally, president of Rapidan Energy Group.

You are recognized for 5 minutes.

STATEMENT OF ROBERT MCNALLY

Mr. MCNALLY. Chair Rodgers, Ranking Member Pallone, distinguished members of the committee, I am Bob McNally, president of Rapidan Energy Group. With the exception of 2½ years in the Peace Corps and 2 years working for President Bush, I've been an analyst, historian, and a student of energy markets policy and geopolitics.

I would like to briefly summarize my view on where we are headed in oil prices and touch on some energy prices.

Let me start with the good news. For the best part of the last 20 years, OPEC is no longer controlling the global oil market. Let me tell you the bad news. For the best part of the last 20 years, OPEC is no longer controlling the global oil market. That is why we have seen the return of Space Mountain price volatility. It is paradoxical, but true: When the oil market does not have a successful, durable manager like OPEC or, before it, the Texas Railroad Commission, oil prices wildly gyrate in boom-and-bust cycles that hurt our economy, national security, and environment.

What to expect in the future as you do your work: More of what we have seen in the past. Oil prices are going to gyrate between 5- to 7-year boom phases when they go up and bust phases when they go down. In the late summer of 2021, we exited a bust phase, lower oil prices, and we are in the foothills of multiyear boom cycle.

President Putin's decision to invade Ukraine hit fast forward on this boom cycle last year, as we saw with $5 gasoline, but oil prices quickly retreated when all the Russian supply we thought we were going to lose did not go offline.

Now, the shale boom is a huge economic and security benefit, but it will not insulate our consumers from oil price volatility. Therefore, we cannot retreat into energy isolationism. We must work with allies to support domestic energy production and support infrastructure, bolster free trade, maintain ample stockpiles, and prevent adversaries from holding the world hostage to economy-reckoning disruptions.

As we enter this new multiyear boom phase, it is all the more important that we resist or correct policy mistakes. These include old ones, like 1970-era ideas of windfall profits taxes or restricting exports. Look, on the windfall profits taxes, they are going to—profits are going to go up during booms and down during busts. Seizure of them by the Government will only worsen supply and increase prices later.

Restricting energy exports will not lower pump prices at all—I mean, for any meaningful period of time, if at all, for our consumers. Longer term it will raise them. Restrict export, you get less supply. Less supply, you get higher prices. Moreover, restricting the exports now would help Putin, help Iran, and hurt our allies.

Newer errors to resist or correct include an overall shift unfortunate from all-the-above to keep it in the ground. As we enter a boom cycle and face geopolitical risk, it is critical the capital flow back to fossil fuel production, refining, and infrastructure. Fossil fuel is 82 percent of our primary energy supply; oil alone, 31 percent; renewables—they are great—7 percent.

Policies that delay or impede the return of capital expenditure to fossil energy will only tighten supply/demand balances further and punish consumers with even higher energy prices.

So the Strategic Petroleum Reserve cries out for course correction, Members of Congress. At 372 million barrels, the reserve is down by about a half, the lowest in 40 years, due to recent emergency and nonemergency sales.

Now, the energy gyrations after Russia's invasion of Ukraine illustrate the folly of frittering away our emergency supplies. To their credit, President Trump—excuse me—President Biden and the Congress agreed to cancel 140 million barrels of planned energy sales, and it signaled an interest in refilling. And, Chair Rodgers, you shepherded a bill that will also impose restrictions.

Finally—and this is often overlooked but very important as you begin your work—I would like to highlight for the committee's attention an overlooked but crucial area for improvement. A large gap has opened between increasingly unrealistic energy transition targets on the one hand and objective and timely analyses to require to assess their costs and likelihood on the other.

President Biden and some Members of Congress have called for outlawing the use of natural gas and coal and electricity by 2035. That is 60 percent of our generation. It is astounding there has been no cost estimate by EIA of this proposal.

Meanwhile, under political pressure, the EIA has ceased providing a policy-neutral reference case scenario and adopted a peak rosy demand scenario. On that basis they have called for no new investment in oil and gas in the world. I can't think of anything more catastrophic for energy than that.

Now, to conclude, our country is blessed with enormous energy resources. The sweats and the smarts exhibited every day by our intrepid energy-sector workers underwrite our standard of living. Perilous market and geopolitical conditions may loom, and policy risks certainly abound. But if you leverage and if we leverage realism, pragmatism, and innovation, we can protect our economy, security, and environment.

I wish you and your committee success.

[The prepared statement of Mr. McNally follows:]

Testimony by Robert McNally at the House Energy and Commerce Committee hearing on Tuesday, January 31, 2023, entitled "American Energy Expansion: Strengthening Economic, Environmental, and National Security."

Summary

Outlook for oil prices:

Since 2008, the oil market has not had an effective, consistent supply manager and therefore extreme oil price volatility has returned. Oil prices have fluctuated between highs that hammer consumers and impede economic growth and lows that force producers to shut in wells. The world is back to riding "Space Mountain" oil prices for the first time since the interwar period.

Where are we now amidst these alternating booms and bust phases? In late 2021 we began transitioning from a bust phase to a boom one. *Consequently, expect structurally higher prices as recovering demand slams into inadequate supply*.

The shale oil boom is a huge blessing but will not insulate us from price volatility

The shale boom confers huge economic and security benefits but won't insulate us from global crude oil price volatility. Therefore, we must continue working with allies to support domestic energy production and infrastructure, bolster free trade in energy, maintain ample emergency stockpiles, and prevent adversaries from holding the world hostage to economy-wrecking supply disruptions in key regions around the world.

Resisting or correcting policy mistakes

Successful management of looming challenges includes resisting or reversing erroneous policy trends and proposals that have unfortunately cropped up recently. They include reviving 1970s-era mistakes such as windfall profits taxes and restricting or banning energy exports.

Newer errors to resist or correct include an overall policy paradigm shift from "all of the above" to "keep it in the ground," draining the Strategic Petroleum Reserve, and closing the gap between wildly unrealistic transition targets on the one hand and objective data and analyses of their real-world impacts on the other.

The geopolitical outlook features important risks.

Near term, potential supply losses from Russia, Iran, and Libya would far exceed OPEC+ spare production capacity. Foreign and domestic actors have begun to attack our vital domestic energy infrastructure.

Longer term, China is striving to secure oil, gas, and critical minerals supply around the world while defending its dominance of renewable energy supply chains.

FAL policy papers

Given the breadth of the topic and space restrictions, the author would request submitting six detailed policy papers recently published by the Forum for American Leadership, whose energy security working group he chairs. They cover subjects ranging from climate policy, confronting China, and making the US an arsenal of energy.

Testimony by Robert McNally at the House Energy and Commerce Committee hearing on Tuesday, January 31, 2023, entitled "American Energy Expansion: Strengthening Economic, Environmental, and National Security."

Chair Rodgers, Ranking Member Pallone, distinguished Members of the House Energy and Commerce Committee, my name is Robert (Bob) McNally, and I am founder and president of Rapidan Energy Group, an independent Washington, DC-based energy advisory firm. I am honored that you have invited me to contribute to your important hearing today. This testimony reflects my views and not those of Rapidan Energy Group.

I have worked for 32 years at the intersection of energy markets, policy, and international politics. Except for service in the Peace Corps and as President George W. Bush's energy advisor from 2021-2003, my professional responsibilities entail providing clients with analysis and forecasts of energy market, policy, and geopolitical trends and events. Neither Rapidan nor I represent or lobby for any person, group, or company.

I would like to review the main market, policy, and geopolitical energy terrain you will encounter as you formulate and implement energy policies to bolster our economy, national security, and environment. I will focus mainly on the oil market, which has been my principal area of professional activity, and respectfully suggest some policies for your consideration.

I would also like to request to submit six energy policy papers appended at the end of this note and published by the Forum for American Leadership, a non-profit foreign policy and national security advisory group whose Energy Security working group I chair. These papers include specific recommendations to improve energy security by making the US an arsenal of energy, counter China's attempt to dominate critical minerals and renewable energy supply chains, and set a course for a sound and serious climate policy.

"Space Mountain" oil prices – Buckle up for a multi-year boom

I need not explain to Members of Congress or any elected officials that gasoline and diesel pump prices matter for our fellow citizens' sense of happiness and well-being, as well as for economic growth.

Last year's sudden spike in gasoline prices to record highs around $5 per gallon and then abrupt reversal were largely caused by shifting perceptions of crude and product supply losses due to Russia's invasion of Ukraine. Looking ahead to this spring, oil prices are in a tug of war between bullish factors such as EU sanctions on Russia's exports and China's economic emergence from COVID and bearish drivers such as inflation and central bank tightening.

While I am happy to discuss during the hearing the drivers for recent and near-term oil price volatility, please allow me to step back and make a broader point about where oil prices are headed in the coming years as your Committee conducts its work. To cut to the chase, members should anticipate steady and sharp increases in oil prices this decade, particularly if the US and global economies recover from COVID and inflationary risks to resume a healthy growth trajectory. This section explains why.

Domestic pump prices are driven mainly by global crude oil prices. Crude oil is largely fungible, widely traded, and globally priced. While countries and states may impose taxes or subsidies on refined products such gasoline or diesel fuel, they all face the same price for the basic input – crude oil.

Crude oil prices have always been volatile, but volatility has been unusually high over the last 20 years compared with the previous 90. From 1932 through the early 2000s oil prices usually spiked only during Middle East wars and crashed during recessions. Otherwise, they tended to be relatively stable.

But over the last two decades, oil prices have soared without wars in the Arabian Gulf and crashed without recessions. It is important to understand why extreme oil price volatility has returned, how long it will last, and what we can expect later this decade.[1]

Since the beginning of the modern oil market in 1859, oil prices naturally tended toward *extremely high* volatility. Oil's unusual volatility stems from the fact that both demand and supply are insensitive or inelastic to price changes. In a bust supply exceeds demand, the resulting surpluses push oil prices down to levels that force drillers to stop drilling. In a boom demand exceeds supply, forcing prices up to levels that force consumers to reduce demand, usually triggering or causing a recession.

Everyone is hurt by continual boom and bust price cycles. The resulting uncertainty discourages investment both in the oil industry and broader industrial sectors, hammers consumption, and complicates policymaking from the Federal Reserve to the Environmental Protection Agency.

Therefore, oil policy from the earliest days can be described as a quest for price stability. The only proven cure to ruinous oil price volatility is having some producers act as swing producers, sometimes also called supply managers. Supply managers attempted to tame oil's natural price volatility by adjusting supply to prevent large inventory imbalances and thus the need for huge price swings.

There have been three successful long term supply managers throughout history: John D. Rockefeller's Standard Oil in the late 1880s, the Texas Railroad Commission from 1932-1972, and OPEC which reigned from 1973 until 2008.

Since 2008, the oil market has not had an effective, consistent supply manager and therefore extreme oil price volatility has returned. Oil prices have fluctuated between highs that hammer consumers and impede economic growth and lows that force producers to shut in wells. The world is back to riding "Space Mountain" oil prices for the first time since the interwar period.

Where are we now amidst these alternating booms and bust phases? In late 2021 we began transitioning from a bust phase to a boom one. *Consequently, expect structurally higher prices in coming years as recovering demand slams into inadequate supply.*

I wish I had better news on that front.

<u>Isn't OPEC+ the new supply manager that will prevent a ruinous oil price spike this decade</u>?

Yes and no. Throughout history, whenever extreme oil price volatility erupts, oil producers attempt to cooperate to tame it. Sometimes they succeed, often they fail. Since 2016, a new group of oil producers including all 13 OPEC countries and ten producers outside OPEC have attempted to play the role of the supply manager. Called "OPEC+" and led by Saudi Arabia and Russia, this group has enjoyed both success and setbacks at stabilizing oil prices.[2]

---

[1] For historical and economic background on crude oil price volatility, see McNally, Robert. Crude Volatility: The History and the Future of Boom-Bust Oil Prices. Columbia University Press, 2017. See also 2012 testimony by Robert McNally before the House Committee on Small Business entitled "'Space Mountain' Pump Prices." https://smallbusiness.house.gov/uploadedfiles/mcnally_testimony.pdf

[2] As a historical matter, it is too soon to say whether OPEC+ will join the ranks of Standard Oil, the Texas Railroad Commission, and OPEC as successful *multi-decade* supply managers. Russia's refusal in November 2014 to contribute to supply management inaugurated the bust phase. After enduring sharp crude price drops in 2015, Moscow agreed to become a supply manager. OPEC+ has operated since 2016 mostly with success, excepting March and April of 2020, when Russia's refusal to support supply control triggered another oil price crash. With the urging of President Trump, OPEC+ resumed supply management and has operated successfully since the summer of 2020.

But looking forward, OPEC+ will be unable to prevent soaring oil prices later this decade as global demand outstrips supply outside OPEC+ because its members do not hold enough spare production capacity. OPEC+ is likely to lose control the same way its predecessors the Texas Railroad Commission and OPEC did – by running out of producible oil supply in a boom cycle amidst rising prices.

<u>The shale oil boom is a huge blessing but won't insulate us from price volatility</u>

The shale boom confers huge economic and security benefits but won't insulate us from global crude oil price volatility. The shale oil boom emerged around 2010 and has turned the US into the world's largest oil producer and, starting in 2020, a net oil exporter for the first time in 70 years. It's important to understand that while we are a net oil exporter, we still rely heavily on imports of crude and products. Our refiners, for example, import large amounts of foreign crude due to crude quality and refinery configurations. And the east coast relies heavily on gasoline and diesel imports.

The economic and national security benefits of being a net oil exporter are clear as they are massive, including employment and international competitiveness gains and acting as an arsenal of energy for our allies facing energy supply interruptions. But as we have seen many times in the past few years, the fact that we export more oil than we import doesn't protect our economy from price shocks caused by turbulence in the global oil market. A disruption anywhere causes a price shock everywhere, including here.

Finally, the outlook for future shale oil production growth is challenging due to price collapses during the bust phase, preference by investors for cash instead of new investment, and high costs for material inputs like steel and labor. Moreover, to the degree governments adhere to a "keep it in the ground" policy stance it will dampen enthusiasm by investors and shale executives to ramp up activity.

Therefore, despite being a net oil exporter, we must continue working with allies to support domestic energy production and infrastructure, bolster free trade in energy, maintain ample emergency stockpiles, and prevent adversaries from holding the world hostage to economy-wrecking supply disruptions in key regions around the world.

Energy policy – old and new risks to economic growth, national security, and the environment

The looming shift from structurally loose to tight oil markets will pose economic and national security challenges in the coming years. Being a net oil exporter confers some resilience to our economy as a whole when oil prices rise. But our consumers and businesses will suffer. Meanwhile, our principal geopolitical adversaries like Russia and Iran will reap a windfall from higher revenues from their oil exports.

Successful management of looming challenges includes resisting or reversing erroneous policy trends and proposals that have unfortunately cropped up recently.

They include reviving 1970s-era mistakes such as windfall profits taxes and restricting or banning energy exports.

In boom-bust eras oil industry profits will rise and fall with prices. During the recent bust phase, profits fell. As prices start to boom, they will rise. Government seizure of oil industry profits will only exacerbate underinvestment and prolong and worsen the boom.

Restricting oil exports will not lower domestic pump prices for very long, if at all, and in the longer term will raise them. Export restrictions would quickly lead to less investment and therefore higher prices. Moreover, banning or restricting energy exports would hurt our allies and help our adversaries like Russia and Iran. Maintaining the bipartisan consensus to support energy exports, exemplified in the bipartisan decision in 2015 to end the crude oil export ban, is therefore essential for our economy and national security.

Newer errors to resist or correct include an overall policy paradigm shift from "all of the above" to "keep it in the ground," draining the Strategic Petroleum Reserve, and tolerating an absence of timely and objective analyses from taxpayer financed forecasting agencies that you and your colleagues require to evaluate policy options.

As signaled by President Biden's deeply unfortunate decision to cancel the Keystone XL pipeline project, federal energy policy has shifted from years of bipartisan, balanced agreement to support all energy sources and technologies to an across-the-board, immediate attack on fossil fuel exploration, production, and development. Examples include proposed ban on drilling on federal lands and waters and moving to use National Energy Policy Act, Securities and Exchange Commission, and other permitting authorities to block, delay, and raise the cost of capital for energy infrastructure projects.

As we enter a boom cycle, it's critical that capital flows back to fossil fuel production, refining and infrastructure. Fossil fuels supply 82% of global primary energy and oil alone 31%. Renewables supply 7%.[3] Shifting from the latter to the former at large scale will take many decades. Therefore we literally cannot afford to artificially ration or restrict investment in fossil energy this decade. Policies that ban or delay the needed capital expenditure will only tighten supply-demand balances further and punish consumers with even higher energy prices.

Alarmed by rising energy prices starting in late 2021, the Biden administration has tentatively begun to walk back, at least verbally, its across-the-board anti-oil and gas stance. Congress can encourage the White House to return to a more balanced and realistic approach to energy policy that will support both fossil and non-fossil fuels and technologies.

Nowhere does federal policy require immediate course reversal than with the Strategic Petroleum Reserve (SPR). At 372 million barrels (mb), the reserve is at the lowest level in 40 years. The reduction is due primarily to the emergency sale of 180 mb since last March. However, non-emergency sales such as congressionally mandated drawdowns since 2017 and the November 2021 non-emergency exchange have contributed to this record low level of protection against severe supply interruption.

If Russia's invasion of Ukraine has a positive aspect, it has alerted officials to the folly of frittering away our emergency energy supplies. To their credit, late last year President Biden and the Congress agreed to cancel 140 mb of planned mandatory sales and signaled an interest in refilling the reserve.

The House under Chair Rodgers' leadership recently passed a bill restricting future non-emergency sales.

Reasonable minds can disagree on the size and composition of the SPR. The subject deserves careful study and debate. But meanwhile, Congress and the President should resist non-emergency sales to raise revenue or in a fruitless attempt to control oil prices. I would respectfully suggest Congress cancel the remaining 125.6 mb of planned mandatory, non-emergency sales.

Space does not permit the appropriate elaboration that these and other policy questions deserve. The appended FAL papers address many topics, from climate to China. However, I would like to highlight for the Committee's attention an overlooked but crucial area for improvement. A large gap has opened between increasingly ambitious climate policy proposals and objective analyses required to assess their costs and likelihood of success. *It is critical that Congress close this gap and insist on receiving expert and unbiased information and analyses from public agencies responsible for producing them.*

---

[3] BP, World Energy Outlook, 2022

The United States leads the world in providing comprehensive, timely, and accurate data on our energy markets. Ably led astute new Administrator Joseph DeCarolis, EIA's data are critical for industry, consumers, policymakers, and analysts and it deserves full funding and support.

However, as described below in this citation from FAL Paper "Congress is Key to Restoring Realism in U.S. Energy Policy," the EIA is being underutilized while its influential international counterpart, the International Energy Agency, has allowed its forecasting to become politicized. Timely, sound and objective data and analysis are foundational for policy evaluation and therefore I urge the Committee to insist it receive the support it requires and deserves from these tax-payer financed agencies.

> Those advocating for unrealistic energy transitions have so far not been held accountable by having official energy agencies analyze their unrealistic, extreme proposals. Specifically, the International Energy Agency (IEA) has recently skewed its forecasts to please climate extremists while depriving policy makers of the ability to evaluate costs and benefits of energy and climate proposals. And the U.S. Energy Information Agency (EIA) has failed to provide Congress with feasibility and cost-benefit analyses of President Biden's executive orders and legislative proposals that would mandate abrupt, massive bans on hydrocarbon energy.
>
> To help right the ship and avoid costly and dangerous policy errors, Congress should reassert its role in setting U.S. energy policy. As a starting point, Congress should insist that taxpayer-funded agencies provide unbiased forecasts of energy markets, as well as objective evaluations of proposed energy and climate policies. Toward this end, the Forum for American Leadership Energy Working Group calls for more congressional oversight of the International Energy Agency (IEA) and U.S. Energy Information Administration (EIA) and recommends the establishment of a National Commission on Energy Transition Realism, an expert, non-partisan commission of renowned energy experts to advise government officials and evaluate policy options for energy transitions.
>
> The Paris-based International Energy Agency is composed of 31 member countries (the U.S. and primarily European nations) and nearly a dozen association countries, including China, India, Brazil, and Argentina. Established in the wake of the 1973 oil crisis, IEA is a forum under the Organization for Economic Co-operation and Development with a mandate to respond to disruptions in the global oil supply and provide policy recommendations, as well as data analysis, 2 on global oil and energy supplies to bolster global energy security.
>
> In recent years, however, the IEA has strayed from its assigned role as a watchdog for energy security and instead has transformed into a lap dog for climate zealots advocating for unrealistic energy transition targets. Congress should steer U.S. policy to walk IEA back to its security mission. Specifically, in recent years the IEA's analyses have veered from security and unbiased analysis to feeding the newly fashionable myth that the United States, and the world, can afford to immediately ban investment in fuels that compromise over 80% of global energy.
>
> Moreover, IEA began skewing its energy forecasts to hide the costs of extreme climate policies while depriving elected officials of the ability to make informed cost-benefit assessments of energy and climate proposals. For example, the IEA 2020 World Energy Outlook abolished its "business-as-usual" (BAU, formally known as Current Policies Scenario) reference case scenario, an unwarranted break with decades of forecasting convention that makes it impossible to evaluate the costs and benefits of climate proposals.
>
> Meanwhile, the non-partisan EIA is being underutilized as an agency that was created to deliver accurate energy data and transparent, objective forecasts and analyses to policymakers and the American people. For example, the EIA has so far not provided Congress with analysis of the energy security and economic implications of recent presidential executive orders and legislative climate proposals. The list includes President Biden's executive order calling for the federal government to reduce its emissions by 65% by 2030 and reach net-zero emissions by 2050, as well as a bill (CLEAN Future Act) introduced by Democrats,

mirroring the President's campaign proposal, to ban the use of fossil fuels—which currently account for 60% of U.S. electricity generation—in U.S. power plants by 2035.

We recommend Congress seize an opportunity to use hearings, letters, legislation, and other oversight tools to restore realism in U.S. energy policy by focusing on U.S. policy at the IEA and the EIA. Furthermore, the creation of an expert, non-partisan National Commission on Energy Transition Realism will further enable Congress to access fact-based data, analysis, and counsel from energy sector experts.

Geopolitical risks abound

The geopolitical outlook features important risks. Near term, potential supply losses from Russia, Iran, and Libya would far exceed OPEC+ spare production capacity. Foreign and domestic actors have begun to attack our vital domestic energy infrastructure. Longer term, China is striving to secure oil, gas, and critical minerals supply around the world while defending its dominance of renewable energy supply chains (please see FAL papers for background and proposals pertaining to China).

The oil market's reaction to Russia's invasion of Ukraine illustrates the fact that prices reflect expectations of the future as well as perceptions of the present. Crude oil prices closed at $96 per barrel the day before the invasion and within 7 trading days it hit almost $140 on an intraday basis. The main reason oil prices soar was widespread expectations and government warnings that sanctions on Russia would immediately disrupt 3 mb/d of oil supply, a large amount and roughly equal to spare capacity held outside of Russia.

Stresses in the refining sector also showed up last year: Refined product prices rose more sharply than crude last spring, because Russia is a major product exporters and China, which has also become a large product exporter, was restricting exports due to COVID restrictions.

Oil prices reversed and collapsed in the summer mainly because the feared loss of Russian supply did not materialize. During the second half of last year, oil prices were generally softer mainly on concerns about overall economic growth, especially due to China's bumpy exit from COVID restrictions and the return of China's product exports.

Looking ahead, geopolitical risk is likely to continue to put upward pressure on oil prices. OPEC+ spare production capacity remains relatively low at around 2.8 mb/d and is concentrated in the Arabian Gulf. As the economy recovers and production growth stagnates, OPEC+ spare capacity will shrink. Geopolitical risks include principally the EU's ban on Russian crude imports that took effect and the ban on refined product imports on February 5. Iran continues to pose a threat to Arabian Gulf oil and gas infrastructure and choke points.

Finally, increasingly brazen and direct attacks on our vital domestic energy infrastructure threaten our energy security. The May 7, 2021, Russian-backed Colonial Pipeline cyberattack resulted in by far the biggest loss of domestic energy supplies due to hostile foreign action against the U.S. homeland.

- The Colonial pipeline supplies 45-50% of East Coast liquid fuel supplies, 90 military bases and installations, and seven major airports.
- The attack also highlighted the importance of engaging in strategic deterrence against future, potentially catastrophic, attacks on our critical energy infrastructure and exposed significant national security gaps that require timely legislative and executive branch remedies.
- Congress must work with the Executive Branch to take robust steps to deter and punish cyberattacks on critical energy infrastructure while preparing the country to manage future attacks better than it did in May 2021.

A spate of recent attacks on electricity infrastructure across the United States has also underscored the importance of improving our grid security.

Conclusion

To conclude on a positive note: Our country is blessed with enormous energy resources. The sweat and smarts exhibited every day by our intrepid energy-sector workers underwrite our high standard of living. Our vibrant, innovating energy sector confers solid benefits for our economy, national security and environment and can do so in the future. Perilous market and geopolitical conditions may loom and policy mistakes certainly abound. But if we leverage realism, pragmatism, and innovation we can protect our economy, security, and environment. I hope you will find these views and suggestions to be helpful and wish your Committee success.

Forum For American Leadership Papers

Eight Necessary Steps to defend U.S. Critical Energy Infrastructure from Cyber Attacks, October 2021
Creating an Arsenal of Energy, April 2022
Blueprint for a Serious and Sound Climate Policy, April 2022
Congress is Key to Restoring Realism in U.S. Energy Policy, September 2022
Setting U.S. Climate Policy Straight: Recommendations for the 118th Congress, December 2022
Restoring U.S. Energy Security: Recommendations for the 118th Congress, December 2022

Mrs. RODGERS. Thank you for your testimony.

I will begin the questioning and recognize myself for 5 minutes.

Restoring American energy dominance and putting security at the center of our energy policy should be the top priority, and we should be sure that our policies don't put Americans and our allies at strategic disadvantage to geopolitical adversaries like China.

The Biden administration's national security strategy released in October mentions climate more than 60 times. It talks about, quote, "an urgent need to accelerate the transition away from fossil fuels." By contrast, the Chinese President's annual report to the National Congress of the CCP a few weeks later only mentions climate twice and warns a gradual withdrawal from traditional energy must be based upon safe, reliable replacements. He talks about less restrictions on fossil fuels. There seems to be a mismatch of priorities here.

Mr. Dabbar, your testimony makes the point that as a dominant energy producer with an all-of-the-above mindset, America strengthened its national security, lowered prices, and helped drive down carbon emissions. The developing world will continue to demand affordable traditional energy for the next several decades.

So does it make sense for the United States to accede its energy dominance in traditional energy to China?

Mr. DABBAR. Thank you, Chairwoman, for the question.

I would like to make the point that China is absolutely not the benchmark for clean energy. Some people like to point out about how much they manufacture. They produce more emissions than the whole OECD combined, and we lead the world in the reduction of tons of emissions, and China is increasing by 3 times per year than we are cutting. These are just numbers; right. These are just facts.

And by far—I wrote a paper at Columbia I published last week. Fifty-seven percent of all the Btu's in China from all energy uses is from coal, and it is going up. It is going up. And so China is not the benchmark, right? They do manufacture some things well, but they are not the benchmark. I wish everyone kind of just knew—knew kind of the fact pattern on that.

U.S. leadership for energy allows us flexibility around prices, as we were hearing earlier. And as many people here who are veterans, there are less people in the way than when I was younger when I was in the military and allows flexibility that did not exist, and it allows us, from a security point of view, to support our allies, which if we hadn't been building what we have been building in Texas and elsewhere, we would not be in the place today to help our friends.

Mrs. RODGERS. Would you speak briefly about how we make sure that we can export our energy and technological innovations like advanced nuclear to developing countries rather than having China and Russia increase their influence?

Mr. DABBAR. So, Chair, as Congressman Tonko pointed out, the U.S. leads the way in energy innovation. We need to do better at manufacturing. We are not bad at it, but we can do better. But almost everything that is out there in the world was invented in America. The lithium ion battery chemistry was funded by DOE and the National Science Foundation. I was there when we won the

Nobel Prize for the lithium ion battery. Drilling technologies, we lead the world in drilling technologies. Solar, thanks to Secretary Chu and DOE, drove down those costs.

So the important part is about how do we take—we need to continue to support innovation. We lead the world on that, and we need to figure out how to take some of those and continue to build on our leadership to export.

Mrs. RODGERS. Thank you.

I would like to turn to Ms. Jackson.

And you make a very compelling point about energy affordability. You know, just a recent review of the Energy Information Administration data shows that residential electricity price is up 24 percent since January 2021, industrial rates up over 30 percent.

Would you just talk briefly about why lowering energy prices is so important to the communities that you work with?

Ms. JACKSON. You know, minority communities are already at the low end of the spectrum in terms of resources and finances. The average income for Black Americans is $48,000 a year. They are basically living on about $3,700 a year. They don't have that much extra money to be able to spend on unaffordable energy. It disproportionately impacts their standard of living.

We are experiencing the largest decrease in the standard of living that we have ever experienced in my lifetime. We are struggling to be able to pay our bills, and be able to go to work. We are struggling to be able to buy food. We are struggling to buy shoes for our kids, clothing. We don't have any extra money left over for even necessities—not luxury items—necessities.

And we want home ownership, but we can't save any money. We want to be able to start our own businesses, but we can't save any money.

Mrs. RODGERS. Thank you.

Ms. JACKSON. Every week we are in a negative deficit.

Mrs. RODGERS. Thank you. Thank you.

Pleased to yield to the ranking member of the full committee, Mr. Pallone, 5 minutes.

Mr. PALLONE. Thank you, Chairwoman Rodgers. I appreciate the opportunity to speak about energy expansion and security today. However, as I alluded to in my opening statement, I reject the premise that fossil fuels are the key to expanding our energy security here in the 21st century.

So Dr. Unruh Cohen, in your testimony you highlighted some of the actions that Congress took during the 116th, 117th Congress and that President Biden took last year to enhance our energy security, particularly through the Energy Act of 2020, the Infrastructure Investment and Jobs Act, the CHIPS and Science Act, and of course the Inflation Reduction Act, all of which this committee played important roles in developing.

So let me ask you, could you speak about how the investments we made in our electric grid in the Bipartisan Infrastructure Law and the hundreds of billions of dollars of investments we made in the Inflation Reduction Act will enhance our energy security by speeding the energy transition?

Dr. UNRUH COHEN. Thank you for the question. Enhancing and expanding the grid is one of the most critical aspects to transitioning to a clean energy economy, reducing pollution from the electricity sector, which then has knock-on effects for other sectors. And so, in both the infrastructure bill and in Inflation Reduction Act, we had critical programs to invest in the resilience of the grid and the expansion of the grid, and I think we have it—those will come to fruition soon.

We are already seeing some good signs on building more transmission as well as using the existing footprint to replace, to upgrade with the technology so that we can carry more electricity and electrons on the given footprint.

Mr. PALLONE. Well, thank you. Now, I also suspect we will hear quite a bit today about the so-called benefits of dirty sources of energy, but even from a pure energy security perspective, fossil fuels come with plenty of costs. So would you talk about how some of the vulnerabilities of the fossil fuel-based economy, both as it relates to our dependence on petro dictators as well as closed to consumers, and could you talk about the risks we would face to our energy security if some of the critical investments included in the IRA were rolled back?

Dr. UNRUH COHEN. That is a big question, but yes. As oil and methane are now international markets, so as we stay dependent on them here in the United States, the demand and use of them around the world as well as either geopolitical attacks or disasters that impact the delivery have repercussions on both the price and, therefore, our U.S. economy.

In the United States, we have a few States that are oil and gas producers, and they see that benefit in their economy. Most of the States are actually consumers, and so, as we see volatility in price, that has a negative consequence on everybody's economic outlook.

So we have to keep that connection in mind, and as I said in my oral testimony and in my written testimony, the future is moving to reducing the use of fossil fuels, ramping up clean energy fuels. That enhances our domestic energy security, it helps improve public health, and as we are seeing, it means more economic development and jobs in the United States.

And all of that movement is underscored by especially the infrastructure bill and the Inflation Reduction Act.

Mr. PALLONE. I know you have only a minute left, but I wanted you to—you mentioned with regard to the Select Committee on Climate, and, you know, actions that Congress could take to build on the work of the BIF and the IRA towards a more clean energy economy. What are some of the things this committee should be focusing on in this Congress in that regard? You have got 45 seconds.

Dr. UNRUH COHEN. OK. Well, I have three that I will try and get through. One, I think there does need to be more focus on grid enhancement. Actually, Senator Manchin's proposal had some language on the grid that I think Energy and Commerce staff also liked, to help deploy more things, deal with cost allocations. So I think that is something the committee should look at.

Workforce issues are incredibly important, and I know in the last Congress, this committee, along with Education and Labor, worked on some very important legislation going towards the energy workforce. I think that needs to be a focus.

And finally, the consequences of the climate crisis are here. Adaptation and resilience has to be a focus of every committee that has some jurisdiction. EPA has some important programs there that fall under the jurisdiction of the Energy and Commerce Committee.

Mr. PALLONE. Thank you. Madam Chair, that sounds like some bipartisan things we could work on.

Mrs. RODGERS. For sure.

Mr. PALLONE. Thank you.

Mrs. RODGERS. The Chair recognizes the gentleman from Ohio, Mr. Latta.

Mr. LATTA. Well, thank you, Madam Chair, for holding today's hearing, and also congratulations to you on your first hearing today, and look forward to working with you to get energy to the forefront here in the United States.

I also want to thank our witnesses for being with us today, and your testimony. It is always important to have you here so we can get your views out.

But if I could start with my questions. Secretary Dabbar, in your testimony, on page 3 you said about reestablishing energy dominance here in the United States, but I want to point and to hone in on one of your sentences. You state, "And they need to radically overhaul ISO rules to encourage baseload power that is being shut down faster than new intermittent plants are being built."

I come from Ohio. You know, what we do, we make things. We have major manufacturing in my district and across the State. That means, when I am talking about steel, when I am talking about float glass, and I am talking about our Central Foundry over in Defiance, and I think about all the different things that we have, we have to have massive amounts of power.

In 2014, we had a polar vortex that went across the Midwest, and every power plant in the State was up and running, that we did not have one blackout or brownout because every one of those power stations was up.

I think it is important to point out about baseload power. Can we get baseload power—and I am—we are for all-of-the-above energy strategies we fought for as Republicans in 2008. But my question is, when it comes to baseload and peaking—and I think that is a problem that a lot of people don't understand—but where is that limit where we have to be at to make sure that we can make sure that these lights come on every day and those plants go on every day with baseload capacity?

Mr. DABBAR. So I am a big fan of wind and solar, and they are great at low costs on kind of a spot basis. They are the worst technologies when it comes to availability and intermittency. OK. So these are just kind of technology kind of fact patterns. And what has happened with ISOs is that they have become kind of Rube Goldberg kind of contraptions that they used to be when many people here were part of initial setting up ISOs about free markets, about having market clearing prices, and have transparency.

In reality, what has happened, RPS standards, production tax credits, all these different things have made these constructs incredibly fragile and encouraged baseload from being shut down in

New York. They shut down good, well-running nuclear power plants to replace it with intermittent.

And many areas of this country, more power plants are being shut down than are being built, and that is just a fact. That is just kind of numbers.

And so at the end of the day, the ISOs, under the Federal Power Act, under the authority of FERC, are allowing an increased vulnerability in the power markets year after year, and I strongly think that FERC needs some more guidance from this committee on increasing the reliability before it tends in the wrong direction.

Mr. LATTA. Let me go on here. You talk about nuclear. I think it is also important to bring this up, because I know that I am working with Senator Barrasso over in the Senate to advocate for policies that build our domestic needs through industry because it is so important. And I think it is important, one of the questions I have got is, how critical is it the United States builds up its nuclear fuels infrastructure in this country?

Mr. DABBAR. So, Congressman, I wrote a paper about this and an article in The Hill. There's portions of nuclear fuel fabrication that are fine, such as making fuel rods, but I think, as many people here know, the U.S. is significantly exposed to Russia in terms of uranium enrichment.

Forty-seven percent of all the uranium enriched services, that are a key component to making nuclear fuel, is from Russia. It makes OPEC seeming like a minor component of crude.

And I know there has been a lot of discussion about how to incentivize enrichment being rebuilt in this country when DOE and Sentra shut down the last enrichment plant in Kentucky. The U.S. has had no ability. And as a side point, the U.S. has lost its ability to make high enriched uranium for the nuclear weapons program. Most people have no idea that we have lost the capability of making new nuclear material for weapons. And that is all related to this topic.

I think this Congress should take a look at how to incentivize bringing it back from Russia.

Mr. LATTA. Well, and again, because again, when you think about with Russia, what is going on today and our dependence on them, it is critical for this country to get out there and make sure that we got a nuclear fuel security program that we can rely on.

But I want to thank our witnesses, and Mr. Chairman, I yield back the balance of my time.

Mr. DUNCAN [presiding]. I thank the gentleman. The Chair will now go to Ms. Eshoo.

Ms. ESHOO. Thank you, Mr. Chairman. I want to thank each one of the witnesses. I have to tell you that I am having a little bit of a tough time figuring out what you are for, really what you are for. I hear a mix of, you know, "Woe is us. We were in great shape, we are not anymore." Some are for a mixed portfolio of energy sources.

If you were to sum up in a sentence, starting with—I don't have my glasses on—Mr. Dabbar, what is it that you want the Congress to do relative to energy? Is it displacement of other sources of energy? Are you saying that we should, you know, pursue more oil?

One sentence, what is your top line to the Congress of the United States today?

Mr. DABBAR. I think in one sentence, Congresswoman, I think properly incentivizing and authorizing all forms of energy that support producing emissions concurrently with that is the right general set of policies to do.

Ms. ESHOO. What does that mean, though? What does that mean? Are you—I mean, if you are promoting oil and that there be more oil exploration, just say it so that, you know, it is clear, and then it is up to Members to decide how that—I think that we have to have a mixed portfolio. I think that countries around the world, including the United States, are in big trouble, given what emissions have caused us.

We know that we have to have energy to operate, but it is a matter of, you know, what it is. So if it is oil, say so, so that it is clear, because otherwise it sounds like, to me, kind of a convention of just—generally speaking, a convention of energy suppliers having a discussion.

Do you want to redo your one sentence, or are you sticking with it?

Mr. DABBAR. I would make one comment, Congresswoman, that a colleague of mine at Columbia made a point that there's a difference between supply and demand. And as long as there's a demand for an energy type, so as long as we are still having internal combustion engines for a period of time—maybe long, maybe short, you can have that debate—it is better for America to produce that oil. Saudi Arabia right now intends——

Ms. ESHOO. Well, your colleague over here said the good news is that OPEC is not in charge of the bubble or whatever anymore. So you don't see—I don't think—well, whatever. It is a difference of opinion of witnesses here.

How about the gentleman at the end, what is your one sentence?

Mr. MCNALLY. Congressman Eshoo, so my one sentence would be: Go back to all of the above. Federal policy in the last 2 years has shifted from bipartisan all of the above to anti-fossil fuels. Keystone Pipeline decision, call to end Federal leasing, the ban on gas and coal electricity——

Ms. ESHOO. That is a long sentence. OK. Because my time is running out.

Doctor?

Dr. UNRUH COHEN. Congresswoman, I would say what Congress needs to evaluate their actions on is getting America and the world to a net-zero-carbon-pollution economy. So you need to evaluate everything that is coming through here of whether that will help advance that goal in the United States or us working with partners.

It may not mean the total end of fossil fuel, but it will be a managed transition to achieve that goal.

Ms. ESHOO. Ms. Jackson?

Ms. JACKSON. Yes. I am for letting the markets decide what energy sources we should use. If you prop up an energy industry——

Ms. ESHOO. OK, one sentence, that is one sentence. Thank you.

Ms. JACKSON. Well, if you subsidize something, then of course they will produce more of that.

Ms. ESHOO. Thank you. I yield back. Thank you, everyone.

Mr. DUNCAN. The gentlelady yields back. The Chair will now go to Mr. Guthrie from Kentucky.

Mr. GUTHRIE. Thank you very much. I think someone said more power plants are being shut down now than being built. You know, the concern with that is, on December 23rd, when we were all wondering if we were going to get home for Christmas because of all the snow is coming in and the ice coming in, the storms coming in, are planes going to fly, you know, all that tension, and are we going to pass a bill or not. And then you get a phone call from my wife saying, guess what, we were out of power.

So in Kentucky, where I represent, I represent the Paradise plant that John Prine's parents are from, that area, that finally shut down the coal plant after that song has been around for a long time.

But we are having rolling blackouts in Kentucky, December 23rd and December 24th. So my constituents experienced that.

So, Mr. McNally, according to the Energy Information Administration, carbon emissions from coal from the United States is 2.5 percent of global carbon emissions. And yet, we are shutting down coal plants, where people are not able to have heat on the coldest days of the year.

So my question for you: Can you talk more about implications for policymakers of, like, the International Energy Agency? They provide forecasts that do not include accurate baseload power needs.

And also let me just go to my second question for you. What information are expert statistical and energy information agencies like EIA and IEA not providing us, and do you think this—these forecasts gloss over the factors that should be considered, like grid reliability?

Mr. MCNALLY. Thank you, Congressman Guthrie, for that question. And if I could have added a comma and a sentence or a phrase to my sentence, it would have been: "and get objective and timely data so you can do your work."

Indeed, one of the main reasons we need to have IEA, especially, return to what we call business as usual or a reference case scenario, is, you can't do a cost-benefit analysis without one.

When folks refuse to put a forecast out saying, Look, here's the future if we just freeze policies in place—they don't do that—then you cannot assess the cost and benefits of different policies to maintain adequate electricity supply for your constituents while we are trying to decarbonize, which is important.

So we have to insist that the International Energy Agency go back to providing the tool you need to evaluate policy.

On the EIA side, they are ably led by Joe DeCarolis, and they are a wonderful resource for this country. However, they have been AWOL in terms of providing you with objective, honest forecasts of the implications of the policies that are being pursued by this administration, or proposed. That is simply unacceptable.

We ought not be afraid of science and analysis and forecast, but you are literally flying blind at this time.

Mr. GUTHRIE. OK, thanks.

And, Mr. Dabbar, a lot of times when I hear people back home, these questions they will ask me, let's say we do what—I think California has electric-only vehicles by 2035. If that was to come to pass for the country, something to that nature, you are dismissing—you have some environmental issues you are trying to address, but you create so many other implications and issues.

People ask me, what am I going to do with the batteries once they are used? The rare earth minerals, I think we left 3 trillion in Afghanistan when we pulled out in that chaotic decision the Biden administration did. I think the Chinese were waiting to move in. I mean, so what are the implications of—I know we are trying to decarbonize, but what are the other implications of some of the decisions coming from things like the Green New Deal, the IRA, other things such as that?

Mr. DABBAR. Yes. So one of the things I always find very problematic is arbitrarily picking technologies by legislators. The technology market moves much faster than the legislative process. I will give you an example. I just wrote a paper in The Hill in which I pointed out that California has looked at banning all internal combustion engines.

But in Congresswoman Kelly's district, they figured out how to manufacture negative carbon gasoline, that when you burn it, it is net zero, OK, so a technology-neutral option, and something interesting coming out of Illinois. Rather than saying everything has to be electric vehicles, why not let innovation drive the—you know, the opportunities that we have in front of us had not been invented.

And so, I think there's a lot of great examples that we should have a technology-neutral policy and let us kind of drive to the future based on that.

Mr. GUTHRIE. Thank you. And just about a half-minute that I have left, what are some lessons learned from Europe and their decisions in their carbon fight? What's some good lessons? Maybe you or Mr. McNally can answer.

Mr. MCNALLY. Don't become dependent on Russia or any other adversary for your critical supplies of energy, a lesson we ought to take heart, as we have heard with regard to China.

Mr. GUTHRIE. Thank you. And you hear people say that is the reason we need to do all the wind and solar because—we can be independent ourselves and still have fossil fuels in this country. We lost that independence.

So my time is expired, and I yield back.

Mr. DUNCAN. I thank the gentleman.

The Chair will now recognize the ranking member of the Energy, Climate, and Grid Security Subcommittee, someone I look forward to working with in this Congress, Ms. DeGette, for 5 minutes.

Ms. DEGETTE. Thank you very much, Mr. Chairman. Mr. Chairman, I ask unanimous consent to submit an article from Energy Wire entitled "Ukraine War to Accelerate Shift Away from Fossil Fuels."

Mr. DUNCAN. Without objection.

[The information appears at the conclusion of the hearing.]

Ms. DEGETTE. Thank you. This article reports that BP's own annual energy outlook acknowledges that, quote, "The increased importance placed on energy security as a result of the Russia-Ukraine war leads over time to a shift away from fossil fuels toward locally produced nonfossil fuels, accelerating the energy transition," end quote.

And so this hearing is about discussing the strength of our economic, environmental, and national security. In other words, its energy independence.

Now, as I mentioned in my opening statement, my colleagues have put together—put forward policies and ideas that suggest that they think energy independence hinges on increased domestic development of oil and gas resources. But as I said, energy independence can only happen with a rapid transition to clean energy.

And so, Dr. Unruh Cohen, first of all, I want to thank you for your work on the select committee. And I also want to thank my colleague Kathy Castor for her wonderful work on that committee too.

In your expert opinion, will increasing oil and gas production help protect the American public from the volatility of the global oil market, and if not, why not?

Dr. UNRUH COHEN. Increased U.S. production will not necessarily protect American consumers from volatile energy prices because we are still connected to the international market, and so if something a world away causes production to go out in Saudi Arabia and we have a price spike, then that passes through our entire economy.

Ms. DEGETTE. Even if the oil and gas is produced here?

Dr. UNRUH COHEN. That is correct.

Ms. DEGETTE. OK. Now, will increasing oil and gas production reduce the cost of extreme weather and climate-related disasters?

Dr. UNRUH COHEN. It will not.

Ms. DEGETTE. And will increasing oil and gas production ensure that our economy, the U.S. economy, is thriving?

Dr. UNRUH COHEN. It will not.

Ms. DEGETTE. Will increasing oil and gas production mean that the United States no longer imports crude oil from countries like Saudi Arabia?

Dr. UNRUH COHEN. Most likely not.

Ms. DEGETTE. OK. So if increased oil and gas production won't protect consumers for price shocks, from the increasing cost of natural disasters, from the boom-and-bust oil economy, and it won't make us energy independent, what do we need to do, very briefly, to achieve energy independence, and how do we need to get there?

Dr. UNRUH COHEN. I think our goal should be energy security, which means relying on clean energy produced here in the United States and working with our allies around the world. And there is a whole host of technologies that will help us do that, and we will see an acceleration in those based on the laws that have recently been signed.

Ms. DEGETTE. Now, you are not suggesting that tomorrow we would have to stop using oil and gas, but you are saying we would need to——

Dr. UNRUH COHEN. Correct.

Ms. DEGETTE [continuing]. Have a transition? Is that right?

Dr. UNRUH COHEN. We need a managed transition. That is what we need for our economy, that is what we need for our energy workers, that is what we need for our communities that depend on energy for their tax base. That is why we had so many things in the Inflation Reduction Act to help those communities and those workers transition.

Ms. DEGETTE. Great. Thank you.

And speaking of those communities, Ms. Jackson, I wanted to just talk to you for a minute because in my congressional district, I have a lot of low-income communities that are also environmentally very vulnerable.

And I have a neighborhood, Globeville-Elyria-Swansea, which is just downwind from an oil—from a gas plant, from a gas refinery. And they have had terrible, terrible environmental problems there: lead in their soil, terrible asthma increases, all kinds of other problems.

So I wanted to ask you the question. I know you advocate for low energy costs, and I agree with that, because those people have a hard time paying for their energy in the winter. I agree with that, but wouldn't you love to see an economy where we could both reduce those environmental impacts on low-income communities and also have low energy prices? That would be a yes or no answer.

Ms. JACKSON. That would be a yes with stipulations.

Ms. DEGETTE. OK. Thank you. I yield back.

Mr. DUNCAN. I thank the gentlelady, and I need to apologize to the gentleman from Kentucky for not recognizing him as the chairman of the Health Subcommittee, so welcome to that and good luck.

I now want to go to the chair of the Oversight and Investigations Subcommittee, Mr. Griffith, for 5 minutes.

Mr. GRIFFITH. Thank you very much, Mr. Chairman.

Mr. Dabbar, Inflation Reduction Act, we have heard about that, and we have heard about trying to, you know, do all this stuff in America, and one of the stipulations in that Act, when they were doing all the Green New Deal-type stuff inside of what was supposed to be the Inflation Reduction Act, was that we would do it in America, we are going to do it in the United States.

So I have got a couple of questions in that regard, and that is, one, recently the DOE awarded a $200 million grant to battery maker Microvast even after the company told the Securities and Exchange Commission that they were heavily dependent upon policies made by the Chinese Communist Party's apparatus in China.

Do our DOE officials do a decent job of vetting these, or do they just plain just fill them out, and if they have got an address in Texas, that is good enough?

Mr. DABBAR. Yes, Congressman, I can't exactly define what DOE did on the Microvast award, but as you correctly said, the company itself told the Securities and Exchange Commission it was a Chinese-controlled entity and that it did not meet American accounting standards.

And the Securities and Exchange Commission was looking at delisting them from the United States. Even though technically it was legally incorporated here, the vast majority of the operations were in China, by their own admission, and with the SEC.

It is—I think it was the intent of the Inflation Reduction Act and the Infrastructure Act to strengthen American companies, and to—for those battery technologies, amongst others, get us away from

China, and that is a bit of a question on why they decided to see that.

Mr. GRIFFITH. So you would think that was a bad decision by DOE, to give them $200 million?

Mr. DABBAR. I think that there are plenty of other companies—there are plenty of battery companies, and I am not certain why awarding it to someone who self-admits that they are a Chinese-controlled entity, they could probably—there's probably other ones in the United States to support.

Mr. GRIFFITH. Let me ask you about Contemporary Amperex Technology Company Limited. Now, this is a Chinese battery manufacturer and also attempting to get both Virginia money and Federal money, made a deal with Ford, and in that deal, Ford would own the physical plant but the Chinese company would have all the technology. They would control all the technology and all the actual manufacturing. Is that really a way to bring American, green technology into the forefront, or are all we are doing is becoming a colony of China when it comes to battery technology, when we take our taxpayer dollars and give it to the Chinese, even if they have a Ford nameplate on the outside of the factory?

Mr. DABBAR. Yes, yes, Congressman. It appears that Ford and the largest Chinese battery manufacturer, the largest one in the world, CATL, decided to structure legally to get around the Inflation Reduction Act American requirements, by having Ford front them, but it was really going to be a CATL plant.

I applaud the Governor of Virginia to turn that down. But whether it is this committee or Ways and Means, I would hope that someone would write a letter to Treasury as they look at writing the letter—sorry—the Tax Code underneath the Inflation Reduction Act and make certain that lawyers—no disrespect to lawyers, I am a nuclear engineer—don't come up with all these options that legally get around the Treasury rules but allow Chinese companies to get a greater foothold in the United States. Hopefully, that is quite bipartisan.

Mr. GRIFFITH. Well, I hope they will be bipartisan, and I can assure you that we will continue to do oversight from this committee. Hopefully other committees will do as well.

With the remaining time that I have left, I would be remiss if I didn't give Ms. Jackson some time. If you could expound on how late and missed electric bill payments, in light of the fact that the rates are going up for everybody in the country, including poor folks, how the late and missed electric bill payments compound the negativity on families living paycheck to paycheck?

Ms. JACKSON. Well, we are not living paycheck to paycheck. We are living paycheck to Wednesday, and then we are borrowing money for people to be able to last us to the end of the week. So the impact is devastating.

This is the deal. Here is the situation. We should be making sure—our community shouldn't be an afterthought. And so, when you are sitting down there thinking about how you are going to work with energy, we should also be considering the cost.

Mr. GRIFFITH. And the cost for the poor families in particular?

Ms. JACKSON. Yes, yes.

Mr. GRIFFITH. Thank you very much. My time is up. I yield back.

Mr. DUNCAN. I thank the gentleman. The Chair will now go to Ms. Matsui for 5 minutes.

Ms. MATSUI. Thank you, Mr. Chairman. I want to thank the witnesses for being here today.

Transportation is one of the most polluting sectors of our economy. Emissions from gas and diesel engines are directly responsible for the premature deaths of 17,000 to 20,000 Americans per year, and that doesn't even take into account the much larger impact of vehicle emissions as one of the leading causes of climate change.

And that is why I have been a long-standing champion of stronger vehicle emissions rules and stronger fuel economy standards, and why I lead yearly appropriations efforts supporting clean transportation across different agencies.

Dr. Unruh Cohen, what are the health benefits of clean transportation, especially with regard to frontline communities?

Dr. UNRUH COHEN. Thank you for the question, Congresswoman. The public health benefits of switching to cleaner transportation, transit, other ways to get around the country and our communities, is huge.

So much—so many communities are impacted by NOx, smog, particulate matters, black carbon, that come from both on-road and off-road fuel use that we can—significantly decreasing those leads to immediate health benefits, both for asthma in kids and elderly.

I mean, we are even at the point where we have identified some of those pollutants can cross the placental boundary in women, and so, you know, babies still in their mother's womb are being impacted by air pollution.

Ms. MATSUI. Thank you. In 2021, I co-led the Medium and Heavy Duty Electric Vehicle Infrastructure Act, which would fund EV charging equipment for medium- and heavy-duty vehicle fleets. This would help State and local governments and municipal service providers and trucking companies electrify their fleets.

The Inflation Reduction Act expands the 30(c) Alternative Fuel Refueling Property Tax Credit to help governments, businesses, and individuals buy and install EV charging stations.

Dr. Unruh Cohen, what will the EV charging infrastructure look like in America in 5 years, given the incentives in the Inflation Reduction Act and the Bipartisan Infrastructure Law?

Dr. UNRUH COHEN. Well, as Yogi Berra is said to have said, it is hard to make predictions, especially about the future, but what I am confident in saying is, things will look totally different. The investments from both the infrastructure bill and the Inflation Reduction Act are really going to mean a huge expansion and improvement in our charging structures across the country.

You know, we are going to see a huge increase in electric school buses, which is going to be incredibly beneficial to the budgets as well as the health of school districts all across the country.

And, you know, I think we will be in a position where people will feel very comfortable traveling, you know, going on the great American road trip in their electric vehicle.

Ms. MATSUI. OK. Thank you. California leads the country in rooftop solar capacity with more than 8 million California homes benefiting from the cheapest source of energy known to man.

I am a strong supporter of rooftop solar and proud to champion expanding the 25D Residential Clean Energy Tax Credit in the Inflation Reduction Act. When we talk about grid resilience, it is important to remember that many homes in Florida and Puerto Rico with rooftop solar did not lose power even after they were battered by powerful hurricanes.

Dr. Unruh Cohen, what role does rooftop solar have in the clean energy transition, and how can it help make our electric grid more resilient?

Dr. UNRUH COHEN. Thank you for that really important question. Rooftop solar has incredible benefits, both to save consumers money on their electric bills and build back neighborhood resilience. I think, you know, increasingly, we will see neighborhoods with rooftop solars developing microgrids, so that when those—and additional placement of power, of PV and batteries, other things that critical schools, fire stations, those types of places in our community, so that when disaster does happen, there is still a power source, there is a place where people can come to get electricity and do the things they need in the aftermath of disaster.

Ms. MATSUI. OK. Thank you. I am running out of time, so thank you very much for your testimony. I yield back.

Mr. DUNCAN. I thank the gentlelady and now will go to the subcommittee chair for Innovation, Data, and Commerce, Mr. Bilirakis, for 5 minutes.

Mr. BILIRAKIS. Thank you. Thank you, Mr. Chairman. I appreciate it. Congratulations on your subcommittee chairmanship as well.

Since the Biden administration came into office, Americans have been faced with a persisting energy crisis. We are in the midst of unprecedented increases in costs of living, and I continue to hear from my constituents on a daily basis regarding how difficult it is to make ends meet. I want to highlight one in particular, if I may.

Patricia is an 84-year-old constituent who lives in Hudson, Florida, in Pasco County, with her 62-year-old disabled daughter. They live on an extremely strict, fixed income. Their electric bill has gone up an average of $50 per month in the past year despite the fact that they do not use central heat or air conditioning in their home—and you know what it is like not to have air conditioning, particularly in the State of Florida.

So, when coupled with other inflationary increases in the price of food and medicine, this mother-daughter senior duo has been pushed to the brink of financial hardship.

Sadly, many of my constituents have similar stories to Patricia, and very clearly, from Mrs. Jackson's testimony, the most vulnerable Americans are disproportionately affected.

The United States needs energy policies that make energy more affordable for Americans, not more expensive. That is the bottom line.

Particularly, I want to focus on improving the permitting process for pipelines and expanding pipeline infrastructure.

I mentioned that this stat, I mentioned it earlier in the roundtable that we had last week, but according to the American Petroleum Institute, Florida will face a 42 percent market—higher market-forward prices for natural gas in the average this calendar year.

One of the main factors contributing to these higher costs is a lack of adequate pipeline infrastructure. Mr. Dabbar, can you please talk a bit about how delays in pipeline permitting, like for the Mountain Valley Pipeline and the canceled Atlantic Coast Pipeline, impact the ability for these projects to be completed or even deter the undertaking of these projects in the first place?

And, again, what recommendations do you have to help expedite pipeline infrastructure for the American Southeast?

Mr. DABBAR. Yes, Congressman. So when a company comes along and wants to build a pipeline or a transmission line, they estimate how much it is going to cost, and how long it is going to take to start building, and how long it is going to take to build. There's two things that have really exploded the challenges around that.

One is that the extended approval processes—when people come up with a project cost and the approvals take a very long time, those project costs, because of inflation, become uneconomic.

And we are seeing that, for example, in Massachusetts, actually, with offshore wind right now. They proposed a contract, the approvals have taken so long, and then the inflation topic is on top of it, all of a sudden the offshore wind projects, they withdraw them because they don't make economic sense anymore.

So the combination of inflation, plus very, very long approval processes are really impeding any sort of construction in this country today.

Mr. BILIRAKIS. Thank you.

Another question for Mr. Dabbar: In addition to addressing delays on the agency's side, is there anything we can do in Congress to reduce the delays brought about by the courts?

Mr. DABBAR. Congressman, I am not—never written a law from scratch like everyone here has, but I do think that the Federal Power Act and the Natural Gas Act are not definitive enough to make FERC approve and meet their statutory obligation to deliver energy, of any type. Everything is getting held back.

So I do—I would recommend that this committee take a look at how to facilitate, and maybe things such as time stops, time clocks, the maximum amount of time to review. That is not to say yes or no. It is just, put a timeline on, so it doesn't take 10 years for a 10-mile road.

Mr. BILIRAKIS. Very good. Thank you.

I yield back, Mr. Chair. Appreciate it.

Mr. DUNCAN. Yes, I thank the gentleman. The Chair will now go to Ms. Castor for 5 minutes.

Ms. CASTOR. Thank you, Mr. Chairman.

Dr. Unruh Cohen, thank you for returning so soon to help us focus on policies that will help America build greater energy security and policies to help solve the urgent climate crisis.

While it is disappointing that Republicans in Congress have dismantled the Climate Committee, I have incredible pride in the progress that our committee and the Democratic-led Congress made for America. Talking about lower-cost clean energy, creating good-paying jobs, and building healthier, more resilient communities. We could not have accomplished all that we accomplished without your leadership and expertise, so thank you very much.

You know, at the outset of the creation of the Climate Committee, we convened and did broad outreach to people all across the country: business, labor, faith leaders, scientists, farmers, entrepreneurs, and Members on a bipartisan basis.

It culminated in this "Solving the Climate Crisis Action Plan" that made 715 policy recommendations to help solve the climate crisis. And I am so proud to report that, as of today, 438 of our policy recommendations were passed in the House of Representatives, and 314 were passed into law.

The report was described as the most detailed and well-thought-out plan for addressing the climate crisis that has ever been part of U.S. politics, an extraordinary synthesis of expertise from social and scientific fields.

What that did is, it really culminated in a lot of the new law, the Inflation Reduction Act, the largest clean energy and climate investment in U.S. history, the Bipartisan Infrastructure Law that will help make communities more resilient and electrify transportation, the CHIPS and Science Act that will empower industries to lead the clean energy transition.

And I love the stat that you cited in your testimony. In the 9 months since the Inflation Reduction Act was signed, companies have announced more than $90 billion into clean energy investment.

So these are magnets now for capital, investing in our workers, in our communities, and in the clean energy future.

And though the Climate Committee ended with the last Congress, our fight has to continue. And I want to highlight to everyone—I am going to send this around to their offices—we did a year-end report that highlights key accomplishments and then additional opportunities, because there are so many more opportunities that we have got to focus on.

Meanwhile, the last 8 years have been the hottest on the planet. The Intergovernmental Panel on Climate Change, in their recent assessment, made clear that the next few years are critical to limit warming. Thankfully, progress begets progress, and with our accomplishments, we are poised now to move now to significant implementation.

You answered a question from—to Rep. Eshoo about the most important is to focus on net zero, getting to net zero, as soon as possible. So go into a little more detail on the most important steps of implementation on how we get there to reach our climate goals and reduce climate pollution.

Dr. UNRUH COHEN. Thanks for the question. And, you know, one of the good news, just going back to some of the permitting discussion in the Inflation Reduction Act, we also had nearly $1 billion set aside to agencies to help them do these analyses and get the projects permitted that we need to get permitted.

So I think that is one of the first things that we need to see. We need to see that implementation on the ground. We need to see—we need to build the EV infrastructure. We need to upgrade and expand our transmission infrastructure and using the programs that we passed in the infrastructure and the Inflation Reduction Act.

We also need to see the partnership with States and local communities and business organizations, because much of what we passed in the Inflation Reduction Act are—there's tax credits, there's other programs and initiatives that are going to help States do even more.

So I think it will be really important for Congress to work with the Biden administration to see those implementation—the implementation of those two laws in particular come to fruition.

Ms. CASTOR. We really are at an exciting pivot point, and thank you again, and I yield back.

Mr. DUNCAN. The gentlelady yields back.

The Chair will now go to the chairman of the Subcommittee on Environment, Manufacturing, and Critical Minerals, my friend from Ohio, Mr. Johnson, for 5 minutes.

Mr. JOHNSON. Thank you. You know, today it is clear from our testimony that America needs a course correction on our national energy strategy, because the current strategy simply is not working.

In fact, it is increasingly evident that we don't really have a national energy strategy at all. A change in direction must be made. Republicans on this committee have the plans and the legislative proposals to do just that.

It has already been said, energy security is national security. That goes for us here in America and for the rest of the world.

Other countries are thinking about this. Look at China. Do you think they cornered the market on rare earths and critical minerals by accident? Do you think it never occurred to them that in a time of great power competition, this would give them the upper hand?

I will get back to that in a moment, but right now America is in a similar spot with natural gas. Global demand is booming, and demand will remain high for decades to come. We have plenty for use here at home and to export abroad. Natural gas can and should be our global power differentiator. We should want the world to rely more on us for natural gas, not the other way around.

So first, Mr. McNally, I appreciated your recommendations in your testimony making changes to the Natural Gas Act, to cut the red tape surrounding LNG exports. I have got legislation that would do that.

Can you explain to our committee, when we are leading in exporting energy resources around the globe, and even though it certainly supports jobs and investment here at home, how is it that that also improves America's geopolitical position abroad?

Mr. MCNALLY. Thank you for that question, Congressman Johnson.

Nothing less than making the United States an arsenal of energy, as we were an arsenal of democracy under President Roosevelt during World War II. We are the world's largest natural gas producer. This year we are going to be the biggest exporter, and two-thirds of our exports have been flowing to our beleaguered allies in Europe facing the largest war since World War II on the continent there.

And we are beating the Qataris, the Norwegians, the Azerbaijanis put together. And, you know, Winston Churchill said, you know, security and energy comes from diversity, diversity alone. And thank God our allies, both in Europe and in Asia, in Japan and South Korea, they know they can rely on the United States as an arsenal of energy, an ample source of energy imports, especially when they face our geopolitical rivals.

So it is hard to overstate when you look at history, when you look at our current predicament and the outlook, how important being an arsenal of energy, keeping domestic production strong, and policies favoring exports alive.

Mr. JOHNSON. Well, continuing with you, Mr. McNally, back to critical minerals and rare earths, I mean, it is hard to believe our military relies on China for this stuff. We need to scale up domestic production rapidly, and if you read the reports, I do believe America can do this safer and cleaner than anywhere else that it is currently being done.

Can you go a bit further into how environmental regulations could be improved or changed to allow this to happen here in the United States?

Mr. MCNALLY. Thank you, Congressman. Congress might want to consider establishing a National Stockpile for critical minerals, and tax credits and other incentives to produce it here at home. And we might want to think about restricting the dependence, at least at some point in the future. It may be hard to go cold turkey, but in the coming years, to require that we get off of Chinese sources for our critical minerals and so forth.

So I think there is a variety of things I think you and others have been thinking of doing. Frankly, it is really just common sense, and I think you should pursue that course and will. Thank you.

Mr. JOHNSON. In a final kind of statement here, you know, I have heard it mentioned several times, you know, to get to these bipartisan solutions, one of the things we have to do is not go into our respective corners on this important issue.

And words matter. And I think one of the things that if we could just come to an agreement, the word “transition” doesn’t mean what a lot of people out in America thinks that it does, right?

The Biden administration uses the word “transition” to talk about getting rid of fossil fuels. That is a negative way to use that term. I mean, we can walk and chew gum at the same time. We can increase market-driven innovation on renewables without throwing out the bath water and destroying the three-legged triad of oil and gas, coal, and nuclear that provide the resilience, the reliability, the affordability, and the sustainability to our electric grid.

With that, I yield back.

Mr. DUNCAN. The Chair now recognizes Mr. Sarbanes for 5 minutes.

Mr. SARBANES. Thanks very much, Mr. Chair.

Ms. Unruh Cohen, I want to talk a little bit about the profits of the oil and gas companies, which, to be very candid, drive me insane. So we have seen, through 2021 and 2022, ExxonMobil, Chevron, BP, Shell, made a record-breaking combined profit that is anticipated to be well over $200 billion.

They were also getting taxpayer subsidies during this time. I will come back to that in a moment.

We also have information today that Chevron announced $36 billion of profit, and Exxon this morning announced a profit of $56 billion.

Some of our colleagues on the other side suggest that, you know, this is a necessary evil, it is what has to be done to fund research and production and so forth on the part of that industry.

But then you look at how they are using these profits, and we see that Chevron announced that it would be spending $75 billion to buy back its own shares, and only investing $12 million into its business to increase production.

And, of course, these profits we have seen over the last few years have come at the expense of ordinary citizens out there being gouged at the pump. So it is clear that, at a minimum, taxpayer subsidies to that industry don't make any sense given the profits they are posting. Would you agree with that?

Dr. UNRUH COHEN. Yes, I would, Mr. Sarbanes.

Mr. SARBANES. And to the extent the Government is going to provide investments, aren't the investments that are reflected in the Inflation Reduction Act, the Infrastructure Investment and Jobs Act, in clean energy, in building out our future there—aren't those the kinds of investments that make a lot more sense?

Dr. UNRUH COHEN. Yes, Mr. Sarbanes, that is correct. And in our work in the select committee, you know, we argued that we should be aligning our tax code and our investments to drive the U.S. economy to this net-zero-carbon pollution.

Mr. SARBANES. I mean, look, it makes—there is something to be gained by going back and looking historically. The United States wanted to establish its fossil fuel industry, at one point, as premier in the world, and so the Government stepped up as a partner to try to drive that kind of innovation, and it was a very successful partnership.

Now we have the opportunity to go create a clean energy future, again, lead globally. That is what we are trying to do with the pieces of legislation that we passed.

But the model is really no different. It is just this mature, successful, very profitable fossil-fuel industry is no longer in need of support. If anything, we should be looking at ways to suss out what about their profit-making enterprise is fair to the American consumer and what is unfair, and how we can look to different kinds of investments to stand up this other set of opportunities.

But before we run out of time, just speculate with me on why the industry can't seem to free itself of this alternative reality. I would think that with the profits they are raking in, they would want to step into that clean energy future, using all of their assets and leverage and exercise leadership globally, establish themselves as real players in that arena.

But for some reason their reflex, their instinct, is to keep doubling down on the old way of doing things. What is the problem there? What is the difficulty with the frame of thinking?

Dr. UNRUH COHEN. Well, I think as you look at oil companies, you know, you really need to examine whether they want to be oil companies or whether they want to be energy companies, because we need energy companies in the 21st century, and that may be a whole range of things. And even if they are saying they want to be energy companies and that may mean they are diversifying their portfolio, then next you have to look, as you mentioned, at where they are putting their money. Is it just a little token piece of investment in other renewables or other technologies, or, you know, are they making a significant shift.

Mr. SARBANES. Thanks very much.

Yield back.

Mr. DUNCAN. I thank the gentleman.

And the Chair will now recognize the gentleman from the crossroads of America, the great State of Indiana, Mr. Bucshon.

Dr. BUCSHON.

Mr. BUCSHON. Thank you, Mr. Chairman.

My constituents in southwest Indiana need access to reliable, affordable, environmentally sustainable energy. Look, all of us want to breathe clean air, we want clean water to drink, and we want clean land to utilize and enjoy in the future. That is kind of universal, right?

You know, but when out visiting energy stakeholders recently, someone explained the current idealogically driven efforts to replace all of the fossil fuel generation with wind and solar in this way—and I am paraphrasing—basically said, "This is a battle between politics and science and physics, and I can tell you which one will win out." And I think what he meant by that is, we need to start looking at the facts and get away from the idealogy.

And in that vein, I mean, Dr. Cohen, I just want to ask you a yes-or-no question quickly: Does the U.S. Government own any gasoline stations in America?

Dr. UNRUH COHEN. Did you say gasoline, gas stations?

Mr. BUCSHON. Yes. Like you go to pump your gas, does the U.S. Government own any of them?

Dr. UNRUH COHEN. Well, I assume DOE has some fueling——

Mr. BUCSHON. Did we build them? The answer to that question is no. And so I just don't see why the U.S. taxpayer should be funding EV charging stations across the country. Look, I support EVs. But why should we be doing that? Because—we are doing that because the market won't bear it. The free market at this point in our country won't bear it. If it in the future does, I am all in. Let the private sector——

Dr. UNRUH COHEN. Well, the U.S. Government has certainly engaged——

Mr. BUCSHON. I didn't ask you a question. I didn't ask you a question.

So every point you make on energy issues in this hearing depends on massive Federal Government subsidies and not the free market. So I just wanted to point that out. I mean, we have a disagreement, I think, between our two sides here: Believers in the free market and let, you know, technology, wherever it goes, all the above, or massively subsidize green energy at the expense of energy security and national security and cost.

So, Mr. Dabbar, I will ask you this question: Do you believe that current investors in the energy sector are primarily motivated—by what? Politics, physics, science? I mean, if they are looking to invest, where—and what are the pressures being put on them by politics?

Mr. DABBAR. So, Congressman, they are still primarily focused on profit. That is excellent for America.

Mr. BUCSHON. Of course.

Mr. DABBAR. But there is pressure from investors around ESG because of, you know, people who feel like that they need to do a certain shift, and they do certainly get that pressure.

Mr. BUCSHON. Of course they do.

And what do you think—same question, Mr. McNally.

Do you have any comments on that?

Mr. MCNALLY. I would agree with my colleague. It is profit return on capital.

Mr. BUCSHON. Right.

Mr. MCNALLY. And I would just point out——

Mr. BUCSHON. Yes. I mean—but I will

just give you my view. But we are using idealogical politics to try to divide—to direct investment in a free market capitalist system, and that is a huge mistake. Let the system work.

Mr. Dabbar, again, you mentioned in your testimony that FERC needs to radically overhaul ISO rules to facilitate increased baseload power.

What should we do?

Mr. DABBAR. The markets that right now try to support baseload, the capacity markets, don't work, and more power plants are being shut down than are being built. I think that FERC needs to come up with new rules that specifically require either the ISOs or maybe even going back to the utilities, like in the old days, where they have an obligation to serve. Right now there is no obligation to serve, and that is the challenge in the markets right now. The individual power plant owners don't have an obligation to serve, and the wires companies don't have an obligation to serve other than keeping their wires up. But supply itself, where it used to be the individual utility had a, quote, "obligation to serve," meaning to actually make the power, have power plants, that has been pushed out to the ISOs, and they are not incentivizing power to actually be built.

Mr. BUCSHON. Thank you for that answer.

I just want to point out someone—one of you mentioned we shouldn't be using China as a benchmark, and let me just partially tell you why. I mean, since 2021, they are building 33 gigawatts of coal-fired power generation, 3 times more than the rest of the world combined. They are building 14 new power plants since 2021 in their own country, and here—listen to this—but they will finish another 27 abroad. They are driving this worldwide. Of course, it is true they are trying to expand the renewables also, no doubt.

Currently there's about 1,118 coal-fired power plants in China, 225 in the United States. So I just want to concur with that testimony that they are not our benchmark. And, first of all—the other thing is we are our benchmark. We should be the benchmark driving the global energy economy.

I yield back.

Mr. DUNCAN. I thank the gentleman.

The Chair will now go to Mr. Tonko for 5 minutes.

Mr. TONKO. Thank you, Mr. Chair.

And before I get into my questions, Dr. Unruh Cohen, I believe you wanted to respond to the last exchange that you had.

Dr. UNRUH COHEN. Just—thank you for that, Mr. Tonko. Just a couple of points.

You know, the physics that Democrats have been concerned about are the physics of climate change, and we have known since 1856, in experiments that happened in Seneca Falls, New York, by Eunice Foote, that putting carbon dioxide in the atmosphere warms things up.

Secondly, the Government is totally involved in many ways in subsidizing transportation, whether it is the hundreds—you know, the centuries-long oil subsidies, biofuel subsidies, you know, we are involved, the U.S. Government, for many years building highways. We are involved in transportation. This is nothing new.

Mr. TONKO. OK. Thank you.

And, Ms. Jackson, I agree totally that we need to be focused on energy affordability and advancing solutions to reduce low-income Americans' energy burdens. It is a must.

In 2015, though, I would acknowledge that one in three households reported experiencing energy insecurity, and one in five reported reducing or foregoing necessities, such as food or medicine, to pay an energy bill. Eleven percent of households reported keeping their home at an unhealthy or unsafe temperature. So this is not a new challenge.

We have and have had real problems with energy affordability in our country, but we also have very important programs, programs that can help alleviate these burdens, like LIHEAP and DOE's Weatherization Assistance Program.

So, Dr. Unruh Cohen, the select committee's report recommended significant support for DOE's Weatherization Assistance Program. Can you explain why we should be providing upfront funding to low-income families to support cost-effective energy retrofits of their homes?

Dr. UNRUH COHEN. Yes, absolutely. Thank you for that question.

Weatherization is one of the most important things we can help low-income families deal with. The incentives for renters sometimes precludes, you know, upgrading on energy efficiency. And so instead of seeing their energy bills skyrocket, with insulation, with that weatherization, they can stay warmer in the winter and cooler in the summer and reduce their energy use and, thus, their energy bills and insulate them also from the volatility of electricity markets.

On a personal note, my mother benefited from this program in Colorado, and it has meant a warmer house for her as she has seen some deadly cold weather there in Colorado Springs lately.

Mr. TONKO. Thank you.

And in the 117th Congress the Bipartisan Infrastructure Law provided some $3.5 billion for the Weatherization Assistance Program. This funding will do a lot of good. Households receiving weatherization assistance save on average of $372 each year on their energy bills. These are real savings and make a huge difference for families struggling to pay their utility bills. And there are other modest changes we can make to the program to improve it further, like allowing more funding to go to each household to account for the increased cost of construction materials and to allow service providers to train and retrain a qualified workforce.

Dr. Unruh Cohen, I mentioned the Weatherization Assistance Program funding in the IIJA, but are there ways that the Inflation Reduction Act is expected to reduce energy costs for Americans?

Dr. UNRUH COHEN. Yes, there is a whole host of additional things in the Inflation Reduction Act that will help homeowners be able to purchase more efficient appliances. We will see more money flowing to State programs that help provide rebates and upfront—you know, cutting the costs upfront as people are purchasing those appliances, as well as just the overall advancement of adding more clean electricity. People will see just a general reduction in electricity costs.

My written testimony quotes some of the analyses that have been done on the Inflation Reduction Act that gives us some sense of the benefits to come.

Mr. TONKO. Thank you.

And, Mr. Dabbar, based on your testimony, you seem very proud of the work you did at the Department of Energy to support the development of innovative energy technologies. You mentioned breakthroughs in battery chemistry, solar technologies, and nuclear energy.

Can you explain what you see as the role of the Federal agencies like DOE to partner with the private sector and academia to support emerging energy industries?

Mr. DABBAR. Yes, Congressman. As we have talked in the past about Brookhaven and elsewhere around the country, new energy technologies, we lead the world, in New York and elsewhere. And one thing I want to point out is that the beyond lithium ion chemistries—lithium ion is great, great American invention, Nobel Prize, say it again—but there are many other technologies in the battery space that can outperform potentially lithium ion, and that will reduce some critical mineral requirements and imports from elsewhere around the world and actually have them perform even better. And the support by this Congress, many labs, DOE is leading the way to even more innovation on that front.

Mr. TONKO. Thank you.

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

Mr. DUNCAN. I thank the gentleman from New York.

And now I will go to the Tar Heel State, North Carolina, Mr. Hudson for 5 minutes.

Mr. HUDSON. Thank you, Mr. Chairman.

Let me just say, you are doing an excellent job. You look good with that gavel in your hands.

It is really an honor for me to serve on this committee again this Congress. You know, our committee has a long history of coming together to produce bipartisan solutions, and I look forward to continuing to work with all of my colleagues on both sides of the aisle in the coming Congress.

And I want to thank our witnesses for your time today and for the excellent testimony you have provided.

For the last 2 years, the Biden administration has failed to take meaningful steps to address energy production. Energy prices have surged to historic highs because of this, and all of our constituents have been paying the price. This winter has been extremely difficult for my constituents, particularly those on fixed income. Bad energy policy and the rising energy prices and the disruptions of supply that result from that disproportionately impact working families and lower-income communities.

And, Ms. Jackson, I appreciate your testimony to that effect. And I would like to extend you an opportunity to answer the question earlier about LIHEAP and affordability for lower income, if you would like to expand on your answer.

Ms. JACKSON. Yes. I wanted to piggyback on her.

You were talking about weatherization programs. The problem with minority communities is that they don't own their homes. What they want is homeownership, and we have climate policies that restrict that because it makes the building materials and the cost of building new homes so expensive that the price creates artificial scarcity and pushes them out of the marketplace.

The other thing is when you talk about electric vehicles, when you create a mandate on electric vehicles, basically what you are doing is excluding Black people from being able to own a private vehicle, which is very much needed so they can be able to get jobs that are outside of their communities, because most of those jobs don't exist where they are.

So weatherization benefits, of course, the landlord who owns the home. Subsidies for solar panels benefits who? The landlords who own those homes. We are renters, the majority of us, and creating higher energy costs is increasingly keeping us out of homeownership.

Mr. HUDSON. Thank you for that answer.

Changing the direction a little bit, last month two power substations in Moore County, North Carolina, were targeted with vandalism, causing a multiday loss of power for nearly 45,000 residents. Besides not having heat during the coldest part of the year, residents of Southern Pines and the surrounding communities lost thousands of dollars as a result of spoiled food and medicine, lost wages for workers and income for business owners, disrupted transportation, and created a lack of accessibility and essential services.

Now, I am proud of my neighbors for the way our community rose up and took care of one another, but this was a tough time.

And just 2 weeks ago another substation was intentionally vandalized in neighboring Randolph County.

Disruptions to our energy supply are dangerous. They are costly, and they are unacceptable, especially when more than one-third of U.S. households reported skipping or reducing expenses like medicine or food in order to pay their energy bill in the first place.

I am looking forward to working with my colleagues to find solutions for these problems and hear from stakeholders on how we can address grid security.

I will start with you, Mr. Dabbar. How do energy disruptions caused by a vulnerable grid impact our national security?

Mr. DABBAR. So, Congressman, it is a high degree of worry. When we were at the department instead of the office, the CESER office—there is a significant amount of equipment that is produced overseas, including we found from China that they could easily have backdoors. Because as Mr. McNally has pointed out, energy is just in time. There is very little storage in electricity. There's some, but it is incredibly minor compared to demand. It is fragile. The system is very fragile because it is very just in time.

And so small disruptions of the electrical grid can have a massive impact. And the importance of building software, hard support, it is an amazing vulnerability for the country.

Mr. HUDSON. Well, thank you.

Mr. McNally, we have got 30 seconds left. Do you want to chime in there?

Mr. MCNALLY. Congressman, as a new resident of Southern Pines, I was directly impacted by that outage. I was also directly impacted by the brazen Russian-based attack on the Colonial Pipeline. It is astounding we have not spent more attention on that. That was the largest foreign attack on our energy sector ever. The closest we came is when the Japanese forgot to bomb the tanks at Pearl Harbor, would have set back World War II a few years. That was the closest risk. They hit us. They cut that vital artery that serves airports, major airports, and military bases. We are not deterring sufficiently. And I think we have some recommendations or we have put in the testimony how to improve—how we manage the next attack. I don't think it was well managed at all, sir.

Thank you.

Mr. HUDSON. Thank you.

Mr. Chairman, I see I am out of time, but with your indulgence I will submit in writing questions for our witnesses on sort of what they see as the role of the Department of Energy and the Congress in working towards this goal of grid security.

Thank you.

Mr. DUNCAN. Members are reminded they can submit questions to witnesses in writing.

The Chair will now go to Ms. Clarke for 5 minutes.

Ms. CLARKE. Thank you very much, Mr. Chairman, and to our ranking member, Mr. Pallone, for holding this important hearing today.

Let me also add my voice in congratulating Chairwoman Rodgers on being appointed as chair of this historic committee.

That said, I am deeply disappointed with the majority's failure to explicitly include any reference to environmental justice, racial or economic disparities, or inequality in their document organizing the jurisdiction of this committee.

I remain steadfast in my commitment to environmental justice and protecting the most vulnerable of our citizens. The exclusion of a clear commitment to environmental justice demonstrates a complete disregard for the historic marginalization and unjust systems exacerbated by our country's dependence on fossil fuels.

The impacts of the climate crisis, including climate disasters like historic heatwaves, hurricanes, and flooding, disproportionately hurt the most vulnerable among us, historically marginalized communities of color, those living with medical conditions that require electricity, older people, communities where there are language barriers, pregnant women, and children.

Far too often outdated energy sources, like dirty peaker plants—power plants which spew twice as much carbon dioxide and 20 times as much nitrogen oxides than regular power plants—are most often located in low-income and communities of color. Democrats understand that our country cannot continue to invest in sources of energy that exacerbate environmental injustices, pollute our communities, and rely on marks dominated by foreign dictators.

That is why we passed the Inflation Reduction Act which, invested a historic $369 billion in clean energy made in America and bringing down greenhouse gas emissions. This bill, which not a single Republican in the House voted for, included provisions to lower energy costs, electrify homes, and so every American, not just the wealthiest, can be part of the transition to the clean energy community.

This transition must be both just and inclusive, which is why we have to look back as well as forward to remediate past injustices.

I want to thank all of our witnesses for joining us today.

My first question is to Dr. Unruh Cohen. Can you expand on the intersections between climate change and racial injustice?

Dr. UNRUH COHEN. Thank you, Congresswoman Clarke, for that important question.

You know, unfortunately, the climate crisis hits the most vulnerable, and that tends to be poorer communities, communities of color, because, you know, they have had to develop in that lower-lying area, places that are flood prone on the coast, not to mention our Tribal communities in particular.

So time after time we see those communities and people who are least able to adapt really being hit. I mean, what we saw in the U.S. Virgin Islands and in Puerto Rico now on multiple times, I mean, it just illustrates within our own country the challenges that we face.

And then when you look globally, you know, you see countries that have contributed just a minimal amount to the warming that we have experienced feeling the huge impact from the, you know, warming that we have already seen.

Ms. CLARKE. So as natural disasters caused by climate change continue to increase in frequency and severity, we must invest in resilience in low-income communities and communities of color so that our homes and critical infrastructure are prepared for when the next superstorm, wildfire, flood, or heatwave strikes.

That is why I have partnered with my colleague Congresswoman Barragán to introduce the Energy Resilient Communities Act in the last Congress.

So, Dr. Unruh Cohen, could you explain the role of distributed energy sources, like microgrids powered by renewable energy, in building out our Nation's resilience to climate change disasters?

Dr. UNRUH COHEN. Yes. As I said earlier that, you know, rooftop solar and other—in microgrids in a normal day contribute, help lower costs for the electricity. When disaster strikes, they can be isolated from the grid and continue to be able to provide power and electricity to communities as they are confronting, you know, some terrible times.

Ms. CLARKE. Thank you.

Mr. Chairman, I just wanted to ask for unanimous consent to submit this report from the American Public Health Association entitled "Energy Justice and Climate Change: Key Concepts for Public Health" into the record.

Mr. DUNCAN. Without objection.

[The information appears at the conclusion of the hearing.]

Ms. CLARKE. I yield back, Mr. Chairman.

Mr. DUNCAN. I thank the gentlelady.

The Chair will now go to Michigan. It must be cold up there. It is also known as the Mitten State. Mr. Wahlberg for 5 minutes.

Mr. WAHLBERG. Thank you, Mr. Chairman. Three degrees this morning.

I appreciate the panel being here today. I wish we had more time to talk about some reality issues as well, and I appreciate the reality that has been brought.

Recently utilities in my State have announced—and in my district—that they will be closing some of our coal power plants even faster than initially planned. While I support cleaning up our environment and diversifying our power supply, we need to ensure that it is done intelligently, that it does not come at the expense of reliability, cost, or jobs. And did I say reliability?

In some areas the coal plants are being replaced by clean natural gas, which has cleaned up the world, or at least cleaned up our country, and could clean up the world if we allowed it to take place and pushed it. In others, wind and solar will take up the mantle. This summer there were already capacity shortfall concerns in the region. I don't know if you have ever been to Michigan in January, but I worry that solar and wind just won't cut it.

Mr. McNally, companies seem to be in a race to transition to green energy. Meanwhile, demands for energy is growing, especially with the Biden administration's push for EV adoption and electrification. And I am not sure these companies even believe in this race, but they lack the courage to stand up to the—I guess my issue—the green religion.

How is this transition impacting reliability across the country? And should we expect concerns about the brownouts and blackouts to grow?

Mr. MCNALLY. Thank you, Congressman.

May I suggest there is an absence of just core knowledge. If you think from Moses until Harriet Tubman, five millennia, the fastest a human being could travel on land was a horse. And the reason we transitioned from horses to cars and planes was not a PCORS policy. It wasn't central planning. It was a human innovation to solve kind of cravings we had. Actually, illumination is where oil started.

And so we have to be very wary when we try to think that government central planning can effectuate a rapid and quick energy transition. The truth is energy transitions happen very rarely, very slowly, and due to innovation and so forth. And we see government get involved, you have unintended consequences.

The earliest version of the corporate average fuel economy programs, the National Academy of Sciences determined about 20 years ago it was inadvertently killing people by forcing automakers to downsize and downward deplete. We had an inadvertent, kind of a human cost. We were trading blood for oil out of a well-intentioned policy to conserve oil.

So my recommendation, sir, would be that everyone—all of us, me included—study the oil history and energy history, have humility, learn the facts, learn about energy transitions, and be very careful when calling for sweeping government intervention in energy markets that sustain our quality of life.

Mr. WAHLBERG. "I am from the Government. I am here to help you," right?

Fermi and Cook nuclear plants are in my district, one on Lake Michigan, one on Lake Erie. The last nuclear reactor we built in the U.S. came on line in 2016, and it took 40 years to get it from conception to operation. Meanwhile, China is now the world's fastest expanding nuclear power producer. We need to reevaluate our country's approach to this technology.

Mr. Dabbar, the cost and timeline to jump through all of the regulatory hoops seems to discourage investment in new traditional nuclear reactors. I get that. How can small modular reactors reshape U.S. investment in nuclear power, or can they?

Mr. DABBAR. So, Congressman, in theory, small nuclear SMRs are similar to the Navy reactors. I ran a Navy reactor. They are built on time and on budget. It is much more likely that, if something is contained, can be produced in a central factory, it is going to be on time and on budget.

That is not good enough. I ran the environmental program at DOE. I ran a very large nuclear business. It was not on time and on budget for a long time. When we left, it was back on time and on budget. People didn't believe that could happen.

And so part of it is good technology, but part of it is culture, transparency, and running projects well. And that is a—I am going to do a forum on that at Columbia on how to make certain we are able to do that in nuclear going forward.

Mr. WAHLBERG. I wish you good success.

And with that, I yield back.

Mr. DUNCAN. I thank the gentleman.

Members are advised votes are going to be called about 1:30. We will try to get to two more, one on each side.

Mr. Cárdenas from California is recognized for 5 minutes.

Mr. CÁRDENAS. Thank you very much, Mr. Chairman.

I grew up with freeways and power plants surrounding my community. As a child I remember not being able to go outside and play because of smog alerts. That was normal for us back then. It has improved because of government responsibility, both State, local, Federal, et cetera. That is the responsible way that government should be involved in trying to manage what is good for the American people, not just consider it to be a laissez-faire, let the markets take care of it themselves.

By the way, the oil industry in America is very subsidized, so it is not necessarily a free market system, hasn't been for a long time and isn't today.

Since I was a kid, science has shown that realities of climate change have worsened. The fact is that communities like mine have felt the brunt of climate change intimately because we have been on the frontlines unjustly paying the price for the—and also for the power plants on all sides of my—excuse me—on my side of town, but not on the other side of town, while certain companies and oil companies get richer.

Unfortunately, my Republican colleagues are beholden to the special interests of the fossil fuel industry and continue to fight for the expansion of oil, gas, and coal. Expanding our Nation's dependency on fossil fuels doesn't strengthen our economy or national security or our response to climate change. It hurts our economy and burdens the American people unjustly.

Democrats understand that, when we don't prioritize our climate and health, it hurts the American people and leads to higher prices in energy, at the gas pump. It makes our national situation vulnerable to our adversaries and, once more, it has devastating long-term effects.

That is why both the Bipartisan Infrastructure Law and the Inflation Reduction Act included critical investments in clean energy infrastructure and grid resilience.

In your testimony, Dr. Cohen, you referred to the IPCC's sixth assessment report being a Code Red for humanity. And I note that the damages that stem from the climate crisis will disproportionately harm disadvantaged communities.

Can you elaborate on why it is necessary to prioritize equity and justice if we truly want to void the worst devastation?

Dr. UNRUH COHEN. Thank you for that question, Congressman.

And, you know, I think it goes back to your childhood experience. Until we had government standards and safeguards for public health, you know, communities like you, kids like you were growing up, you know, surrounded by smog and other things.

Mr. McNally made a point about horsepower, and I think it would just be important for this committee to remember that the U.S. automobile industry was still using whale oil as a lubricant until we banned the import of it in 1971.

So there are important reasons for the Government to intervene, and equity and addressing environmental injustice is a criminal one right now. We spent a lot of time on the select committee thinking and recommending we integrate that. I think we are in a place where we have turned that corner, and every climate and energy bill really needs to have that environmental justice and equity lens.

The Biden administration is moving forward on that with their Justice40, and I think, you know, Congress needs to continue to support those type of programs.

Mr. CÁRDENAS. When was the EPA created? Wasn't it early 1970s?

Dr. UNRUH COHEN. It was, yes, in the 1970s. Yes.

Mr. CÁRDENAS. And has the EPA been a good impact on improvement of our environment in our country, or is it something that maybe should have never come about?

Dr. UNRUH COHEN. I think the EPA and its mission to protect public health and welfare has been incredibly critical to our economic development. We have seen the U.S. have phenomenal economic growth since the 1970s, as well as cuts in air and water pollution. We need to do more as we learn more, but we can absolutely protect every American's health even while we grow our economy.

Mr. CÁRDENAS. One of my colleagues talked about foreign attacks, but yet at the same time, I think they called it the Freeze that happened in Texas. And that turned out to be not only deadly but also, beyond that, long-term shocking for families that were paying hundreds of dollars a month for their energy bills and then found themselves at $5,000 and $10,000 or more in energy bills.

Dr. UNRUH COHEN. Yes.

Mr. CÁRDENAS. Was that an attack from another country, or was that Mother Nature?

Dr. UNRUH COHEN. That was extreme cold and the natural gas industry in Texas not being prepared for it.

Mr. CÁRDENAS. Or not being regulated very well either?

Dr. UNRUH COHEN. I think they could do better, speaking as a native Texan.

Mr. CÁRDENAS. OK. Thank you.

Thank you, Mr. Chair. I yield back.

Mr. DUNCAN. Thank you to the gentleman.

The Chair will now go to the Peach State, even though we grow more peaches than you do in my district, Mr. Carter from Georgia, 5 minutes.

Mr. CARTER. Thank you, Mr. Chairman.

And I want to take this opportunity to begin with to congratulate the Chairwoman, and I am excited about what is ahead for us on this committee in the next 2 years, in this session, and I want to congratulate her.

I also want to congratulate her on the choice for the first full hearing that we have. What better bipartisan subject could we have than American energy? And I think, you know, we all agree that we want America to be a positive energy leader in the world. So kudos on choosing this, and it is extremely important.

Mr. Dabbar, you mentioned the fact that we want to return to American energy dominance and that it is very important. And this would require allowing America to unleash all of our energy potential, and we are certainly not doing that at this point.

When we talk about energy security globally, we have got to be talking about reliability. It is paramount. We understand that. And I think that is probably why we haven't heard more about global power relying on solar or wind, because they are just not reliable at this point. But nuclear is, because it is baseload. It is 24/7. It is clean. It is everything we want.

And, you know, it is exciting to think about the future as far as the innovations go, the advancements that we have seen in fusion, permitting SMRs. We just talked about SMRs. I am excited about that, and I think people should be excited about it.

But let me ask you this: In the context of global energy security, when we are talking about global energy security, how important is it for us to have a domestic—a robust domestic nuclear energy to compete with adversaries like China and Russia around the world?

Mr. DABBAR. So our energy costs have been the lowest, amongst the lowest in the world, including in electricity. That is a great sucking sound of industry, and we are seeing the opposite of that in Germany at the moment, right: high-risk energy policies, high prices. Their industry is moving out, and it is great. They are moving to America. It is actually a big strength of what we have as a result of all of that.

And so that is—energy security drives the economy, drives us as a nation. It is also about us in the world. Once again, I am making reference to all the veterans here. We fought a lot of wars. A lot of wars were around energy. The whole Kuwait War was, frankly, about them invading and about energy.

And our ability—and with all due respect, when we move from 4.8 million barrels a day of crude oil to 12.9, we came off—if you just look at the numbers, we came off of energy risk from OPEC. That is just numbers. We imported less from OPEC. We are less exposed to OPEC. And the energy prices were set in the Permian Basin for the world, and that is actually something driving innovation, driving costs down. That allowed us to have flexibility that is incredible.

Mr. CARTER. Good. And thank you for that.

And I read with interest your—the article that you coauthored in The Hill about what is at risk due to Russia's nuclear power dominance. And, you know, it was interesting. It was also alarming, alarming that, you know, we have got to address this with our allies, and it is something we have got to work together with our allies.

You also mentioned about Europe just then. I had the opportunity to go to Europe with the Conservative Climate Caucus, and what we witnessed there is a situation where they have allowed their policies to get ahead of their innovation. They are shutting down nuclear plants and relying on wind and solar when they are not ready for it yet, when—we all want to go to renewables. We all want to do that, but we have got to do it in such a way that we don't allow our policies to get ahead of our innovation, and that is exactly what they have done.

But, again, the points that you bring up in this article that you coauthored, I am—they are alarming, and I appreciate you bringing it too.

I want to go quickly to Ms. Jackson.

Ms. Jackson, you bring up some great points, and I had the opportunity to read an article that you wrote as well about the minority exploitation game called environmental justice. And you mentioned in there about Ford Motor Company and about how they have $60 billion for—in the IRA, there was $60 billion for environmental justice programs about the size of Ford Motors who employs over 200,000 people.

You know, all of this money that we put into the IRA—or was put into the IRA—I am not saying we, but was put in the IRA, it could have been used for better ways. Can you give us an example?

Ms. JACKSON. Yes, absolutely. You know. The biggest injustice of environmental justice is poverty and the fact that we are using environmental justice money to—that is going to lobbyists and never going into the community to create economic stability. It is not creating any business districts, not industrial parks, nothing that is going to improve the lives of those individuals.

That money was equivalent to 2,000—the Tulsa Black Wall Streets, we could have built 2,000 Black Wall Streets for the equivalent of that environmental justice money. In other words, we wouldn't be having a conversation about poverty right now because all of our Black communities would be thriving. But, instead, we are going to get a few retrofits, a few windows, and nothing is going to change about the economic condition.

Mr. CARTER. Thank you. Thank you for that.

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

Mr. DUNCAN. Thank you.

I apologize for the Members and the witnesses, but votes have been called on the floor, so we are going to recess until 10 minutes after the close of the second vote. There are two votes. The witnesses can take care of business, and we will be back 10 minutes after the close of the second vote.

And the committee stands in recess.

[Recess.]

Mr. DUNCAN. All right. The subcommittee will come back to order.

In the order of things, Dr. Ruiz is next from California, 5 minutes.

Dr. RUIZ. Thank you, Mr. Chairman.

I want to focus today on the question of reliability. As an emergency medicine physician, I know how important reliable electricity is for powering critical medical equipment and preventing life-saving medicine from spoiling. And one of the best ways to increase reliability, expand our Nation's power grid, and move towards a carbon-free energy system is to dramatically increase the battery storage capacity on our Nation's grids.

Lithium batteries are a critical component of electrical vehicles, but they are also an obvious solution to securing our clean energy future, while also providing the grid reliability that we need. In fact, batteries are already being used to increase reliability on the power grid.

In my district, California's 25th District, the Crimson Energy Storage in Blythe is currently the second largest energy storage project in the world, constructed by union labor, including the International Brotherhood of Electrical Workers, I believe also the Teamsters, powering vital medical equipment, electric vehicles, and so much more.

Our country needs more batteries and more batteries storage projects like this. Batteries need lithium, and lithium is found at the Salton Sea in Imperial Valley, California. In my district the Salton Sea has a massive supply of raw materials that can power a clean energy future. The Salton Sea has the fifth largest deposit of lithium in the world, and it has the potential to supply the lithium needed not only for electric vehicles but also the batteries that can make our electric grids resilient.

Lithium Valley, as we like to call it back home, is the key to unlock our clean energy future, cement the U.S.'s leadership, secure our energy independence, strengthen our battery supply chain, and protect our national security.

Dr. Unruh Cohen, in your testimony you mention that China has a head start on the rest of the world in clean energy. I am sure you know that the head start includes both the chemical supply of lithium and the manufacturing of lithium batteries. In fact, according to the World Economic Forum, the United States is eighth in lithium production in the world, and China has 60 percent of the lithium refining capacity in the world.

Can you talk about the effects of the United States lagging in producing a lithium supply and in manufacturing batteries?

Dr. UNRUH COHEN. Thank you for the question, Dr. Ruiz.

And let me just underscore the importance of reliability first and say, you know, wind and solar availability is predictable. And so when you couple that with battery resources, we start to have a full spectrum 24/7, our opportunity to provide electricity to the grid from renewables.

To do that, you are right, we need more lithium. And I know, you know, there are projects in Salton Sea and around the country that are, you know, getting their permits, moving forward, getting investments. And I think, you know, the investments that we see in the Infrastructure Act and in the Inflation Reduction Act are going to drive that further.

The additional good news when it comes to the grid is we actually can take—when an EV has used their batteries and they are no longer great for that, you can put them in ways and use them on the grid.

Dr. RUIZ. Yes.

Dr. UNRUH COHEN. So there is a lot of energy that——

Dr. RUIZ. So in terms of China—us importing the majority of batteries, et cetera, lithium from other countries, we all know too well that it is dangerous when our Nation is dependent on foreign supply chains, because if a foreign country decides to block exports or favor its own domestic companies for whatever geopolitical reasons, our clean energy revolution is stopped dead in its track.

That means we need strong domestic supply chains that start in communities like in the Imperial Valley. That means making sure companies don't simply come in, extract community resources, and turn it into batteries elsewhere. And that means that those jobs are filled by local workers, and those benefits come home to our communities.

All of this is more important than ever to ensure that the benefits of this lithium goes back to the Salton Sea, which could become a worse environmental disaster with reduced waters flowing from the Colorado River and the exposed playa putting fine particular dust in the air that can affect people's lungs, blood, et cetera.

So the Inflation Reduction Act will help us build a strong supply chain for a clean energy future here at home.

In what ways do you expect recently passed legislation like the IRA to strengthen our domestic supply chains and encourage domestic manufacturing of batteries in the U.S.?

Dr. UNRUH COHEN. I think we are already seeing the results of that. I mean, of that $90 billion in investment that I mentioned in my testimony, a lot of that is electric vehicles. I think we just had one today that maybe I didn't get to incorporate. So almost every day there is a new announcement.

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

I now recognize myself for 5 minutes.

I want to thank the panelists for being here. It has been very informative.

I approach energy in two broad categories: transportation fuels, which is fossil fuels and electricity for EVs, and then baseload power generation. And in baseload power generation, you have nuclear power, which can't be ramped up and ramped down very quickly or easily, so it remains constant.

And then you have renewables as part of that energy metrics as they mix everything for transmission. Renewables come on line when the sun comes up or the wind is blowing. It could be a climatic event that makes solar go offline or they can see it starting to climb, or it might be the sun setting.

And so when that happens, they have got to fill the gap to make sure that the baseload power is constant for our consumers. That is our constituents' homes, that is manufacturing, that is municipalities.

And so what works in that gap-filling area is called hydro, if it is available, and natural gas. And so we have got to make sure that natural gas is a big part of that. And what I hear from a lot of my utilities is that we have a pipeline issue in this country, that our pipelines are about at capacity for the amount of gas that is drawn off of it. And if we don't meet that future demand, the gas isn't going to be available.

So I wish the infrastructure bill would have included more gas pipeline permitting and projects, but unfortunately it didn't. It focused a lot on EVs and charging stations and all that.

And look, as Mr. Dabbar said, I like wind and solar. I think it is groovy, and it ought to be part of the matrix, absolutely. But I also know about what works to provide that baseload power that our manufacturers need: always on, always ready, always available 24/7, 365 baseload of power.

And right at Christmas Eve in South Carolina, even we just about had a Texas event because of some of those situations where wind and solar wasn't possible. Coal-fired power plants take 3 days to crank up to thermal capacity to meet energy needs. Natural gas is 30 minutes. So it has got to be a big part of that.

Pipelines is the new word from "The Graduate." It was plastics in the movie "The Graduate." It is pipelines today.

So I want to focus on nuclear. Nuclear energy must be a part of our energy matrix moving forward. Unfortunately, other countries are outpacing us. Adversaries like Russia and China have continued to develop and invest in their nuclear industries. In just the past few years, China has brought 21 reactors online—many of them are advanced reactor designs—and 31 plants are under construction.

In this country we have got to focus on advanced nuclear or small modular reactors, thorium reactors, things that work, things that could be walkaway safe.

Unfortunately, lack of development in U.S. industry is in large part due to regulatory and licensing structure that disincentivizes private-sector investment. I have got a piece of legislation we filed last Congress we hope to reintroduce, if we haven't already, that expedite the permitting process for nuclear power plants. If you have got a proven design that works, we can replicate that, do the geology, make sure that there ares no things there with the earth and earthquakes and other things, that it can be sited there, the water source there for cooling, but replicate that in an expedited permitting process. Let's gets nuclear power online as we continue to look at SMRs and other advanced nuclear reactors.

I was glad to see an article this week that the first SMR was actually permitted to come on line and start producing energy as a test case. Once we see that it works—heck, it has worked in the United States Navy for, what, 50, 60, 70 years—it works. Modular reactors work.

So those are some of the things that I believe in.

Mr. Dabbar, we, of course, don't have a government-controlled energy sector. We need to incentivize private-sector investment. What are some of the high-level suggestions to modernize the nuclear regulations of this country to invite innovation, to invite growth, to encourage exports of nuclear technology and lead, once again, this globe in nuclear energy?

Mr. DABBAR. So, as you pointed out, Congressman, the Nuclear Regulatory Commission is extremely conservative, as you know. You interview regulators all the time. Over the course of time, they get more and more conservative because they don't want anything overturned in the courts. And as a result, it is drug out, you know, tremendously as a result of that kind of increased view of, like, let's review it 10 times to Sunday.

So I think any sort of, you know, legislation that might allow them to facilitate that, to make it—to get them focused, I think that is important, because that's where we have ended up.

The other thing that I think we should look at doing is taking a look at some of the Federal power entities like WAPA, like Bonneville, and so on, and take a look at them willing to contract as like a first customer for some of these new reactors. So I think any authorization for DOE or TVA or others to be a first customer of those plants, I think that will provide a big jolt for the industry.

Mr. DUNCAN. Yes, that is spot on. This committee will have an RCN to talk about those things, ask some of these same questions, also look at closing the fuel cycle and possibly recycling of spent fuel at commercial reactors, because there is a uranium concern and a fuel concern.

So my time has expired, so I will now go to Mr. Peters from California.

Mr. DABBAR. Congressman, 5 seconds.

Mr. DUNCAN. Five seconds.

Mr. DABBAR. The Savannah River National Lab proposed to me a recycling plant when I was Under Secretary, and I think you should be talking to them about their idea, because it is exactly what you just said.

Mr. DUNCAN. We are. And there are great sites like Hanford, Idaho Flats, and others across the country that can play a part in that.

Mr. Peters from California is recognized for 5.

Mr. PETERS. Thank you, Mr. Chairman.

Our path to true energy security is not to double down in oil and gas. The oil embargo in the 1970s, the Gulf War in the 1990s, Hurricane Katrina in 2005, the 2008 financial crisis, COVID, Putin's war on Ukraine all contributed to a roller coaster of harmful oil price volatility under both Republican and Democratic Presidential leadership. It is essentially what Mr. McNally testified to.

And despite the pain of these price fluctuations, Republicans continue to propose the same false solution—more oil and gas—and that will only lead to more price uncertainty and pain as we have seen at the gas pump recently and as San Diegoans are seeing on their natural gas bills today.

The solution long term is clean innovative energy technologies, which are becoming cheaper than fossil fuels and produce energy domestically without reliance on foreign adversaries. It is not radical. It is smart. Even Texas takes 40 percent of its power from noncarbon sources, and it is not because Texas is against oil and gas. It is because it is the sensible thing to do.

I am proud that we provided significant funding in the 117th Congress to build this clean and more secure energy future, but I want to talk today about the 118th Congress. Something that we haven't talked about much today is speed, because we can have all the money in the world, but we will still fail if we don't act faster.

Look at high-voltage electric transmission lines. According to research from Princeton, 80 percent of the projected emissions reductions from the Inflation Reduction Act depend on building transmission faster.

Berkeley Lab found that there are currently enough wind, solar, and storage projects in the pipeline to power nearly 85 percent of our economy, but 80 percent of those projects could be canceled due to insufficient transmission.

According to Jesse Jenkins at Princeton, the current power grid took 150 years to build. To get to net-zero emissions by 2050, we have to triple in size in the next 30 years. That means 200,000 miles of new transmission lines by the 2030s, 200,000. Over the last decade, we have built just 1,800 miles per year because each one takes more than 10 years to complete—and 7 of those 10 years, seven of those 10 years—are just for planning and permitting.

Other countries are doing it just fine. According to the Americans for a Clean Energy Grid, North America has built just 7 gigawatts interregional transmission. Less than half of that is the U.S. So let's say we are about 3 or 4. South America is 22, Europe is 44, China is 260.

In the 1970s, our environmental priority was to stop dirty, destructive projects. The National Environmental Policy Act, or NEPA, was designed to require public input and to ensure Federal agencies assess the environmental impacts of proposed Federal projects and their alternatives before they made decisions. And we have NEPA to thank for a great deal of environmental presentation, but its implementation is inevitably slow, with documents that are thousands of pages long, reviews that take more than up to 4 years to complete, and NEPA is also the most litigated environmental statute, with lawsuits dragging on for more than a decade.

And the simple threat of litigation can prevent new projects, including the climate action projects I have named. We must build to beat our climate goals. Climate action is about building things, not stopping things. To save the planet, we must build transmission, utility-scale solar power, passenger rail, hydrogen pipelines, direct-air carbon capture, bike lanes, tons of in-fill housing. And, ironically, many of the laws intended 50 years ago to protect the environment could undermine our climate action.

Some claim that NEPA isn't the problem or that it can't be touched. But as someone who has practiced law in this field, I must say I don't believe we can sustain project-by-project litigation on climate initiatives and still achieve climate action with the time and the money that we have.

These excessive process requirements effectively inflict a punitive tax on clean energy. And fixing laws to serve the public good, that is our job. We can achieve high environmental standards with less time.

NEPA was signed into law in 1970. One hundred sixty-five of our congressional colleagues were not even yet born. We are as far in time from 1970 as 1970 was from 1917. This is an old law, folks. We are charged to update it for our times, and that is OK, because it didn't come from Moses on tablets. It came from people just like us who had IBM Selectric typewriters.

Excessive process is not the only climate challenge, but it is one undeniably. And those of us committed to climate action who say that it is the greatest threat we face, we are called on to rethink cumbersome requirements that are decelerating clean energy products.

To unlock a future that doesn't depend on greenhouse gas energy, we have to update our environmental laws to make it easier, not harder, to build. I encourage all of us to engage in a constructive process with the White House, with the communities of interest to come up with a real bipartisan process to enact sensible permitting of forms, deliver energy security and environmental protection for the American people.

I look forward to working with all of you on that, and I yield back.

Mr. JOHNSON [presiding]. I thank the gentleman for yielding back.

The Chair now recognizes Mr. Palmer from the great State of Alabama for 5 minutes.

Mr. PALMER. Thank you, Mr. Chairman.

I want to start off by talking about how these Green New Deal policies impact people. Right now there are about 2 billion people around the world who have little to no access to reliable energy. And it reminds me of a quote from Thomas Hobbes' book "The Leviathan" when he described life at that time as solitary, poor, nasty, brutish, and short.

Just to give you an idea of what having access to reliable energy means, the World Bank reported that since 1980, energy consumption has doubled. It was half what it is today in 1980, and extreme poverty was 4 times higher then than it is today.

Life expectancy because of China's expansion of their energy grid—and, obviously, it is mostly coal-fired power plants, but their life expectancy has increased by 10 years. This is not just—I mean, I worked for two international engineering companies. You are going to hear me repeat that multiple times. I have a pretty good idea of what it takes to generate power. I worked in everything from refuse energy to aerospace, different projects. And I will just be honest with you—and it is not just my opinion. There was a report from the Electric Power and Research Institute that basically says that this study shows clean electricity plus direct electrification and efficiency are not sufficient themselves to choose net-zero economywide emissions.

In other words, no amount of wind turbines, solar panels, hydropower, nuclear power, battery power, electrification of fossil technologies, any of that is going to get us to net zero by 2050. That is a Wall Street Journal article describing that policy—that research paper.

Ms. Jackson, you and I have had this discussion before. I grew up dirt poor. My dad had an eighth-grade education. He built a house that I grew up in. He only finished what he could pay for. Unlike the Federal Government, he didn't spend more than he had. But we heated the house with a coal heater that sat in the kitchen, and in the wintertime we slept under about a foot of blankets that my mom and grandmother and great aunt quilted.

What does it mean to people when they see their power bills going through the roof and they are having to make decisions on how much food they can afford to buy and still be able to adequately heat or cool their home?

Ms. JACKSON. You know, one of the things that we always advocate for, because I hear a lot of people talking about climate change policies, but I have never heard anybody talking about actually how many degrees it is going to save.

If climate change policies are more harmful than what we are trying to save, then we shouldn't be enacting it. One of the things we advocate for is that you do an economic impact study on the lives of the people that it is going to affect, because the climate change policies right now are more harmful for low-income and minority families than the climate change—than what climate change is supposed to be doing.

Mr. PALMER. Well, we are hurting people.

Ms. JACKSON. We are hurting real people. I get calls every day from people that don't have my political lean, asking for help, Black people, NAACP people, Urban League people, saying, "We need help." They can't afford to pay these bills, but nobody is listening.

Mr. PALMER. What gets me is, we keep hearing report after report from Europe, from United Kingdom, about the number of people dying as a result of excess winter deaths because they can't adequately heat their homes in the wintertime.

We see that here as well. And people can't afford to heat their homes adequately and still afford their medicine. It really impacts people with respiratory disease, cardiovascular, that sort of thing, and it is almost like my colleagues across the aisle think this is collateral damage and it is acceptable to achieve what clearly they are not going to achieve by 2050.

Ms. JACKSON. Yes.

Mr. PALMER. So, Mr. McNally, I want to ask you, I want to pivot now, China is building coal-fired plants all over the world. There was a report came out last year, last fall, that they had built 14 coal-fired plants. They are building out infrastructure around the world, developing allies, and yet we are going to make ourselves dependent on China for our energy production. Does that make any sense to you?

Mr. MCNALLY. Congressman Palmer, if there is one area, perhaps, of bipartisan agreement, I think we are all clear-eyed—or hopefully are—that China views energy and the transition and dominance of both the power and the transportation aspects of energy as a way to replace the United States as the world's preeminent power. It is a militarized, superpower strategy, and we ought to see it as such and build our own clean energy here.

Mr. PALMER. Mr. Chairman, that time went by quick, but my time is expired, so I yield back.

Mr. JOHNSON [presiding]. The gentleman yields back.

The Chair now recognizes the gentlewoman from New Hampshire, Ms. Kuster, for 5 minutes.

Ms. KUSTER. Thank you, Mr. Chairman and Ranking Member Pallone, and our Energy and Environment subcommittee leaders for holding this important hearing. I want to start by taking a quick moment to congratulate Chairwoman Cathy McMorris Rodgers on making history as the first woman to chair this great committee.

While we may represent districts on opposite sides of the country, our constituents rely on similar energy resources, including hydropower, and that is why I look forward to working with all of you to unlock the full potential of hydropower to provide affordable, reliable, and clean energy to communities from the Pacific Northwest to the Northeast.

It is important today to remind ourselves that Democrats and Republicans share many of the same values when it comes to our Nation's energy resources. We believe that all Americans should have access to low-cost, reliable energy that does not depend on foreign resources or foreign technologies.

While we may have our policy disagreements, if we focus on these shared goals, I believe we can find enough common ground to deliver on.

Last Congress, we passed historic legislation to invest in our country's clean energy future and put the U.S. back on track to lead the clean energy revolution.

The Infrastructure Investment and Jobs Act, IIJA, included approximately $800 million in investments in our Nation's dams, including to upgrade our electrical grid for hydropower energy.

In his testimony, Mr. Dabbar spoke about the importance of FERC prioritizing baseload energy, and I agree: Hydropower is the baseload power that we need.

With black start capabilities, and the potential for additional energy reserves through pumped hydropower storage technologies, hydropower can provide additional resilience to our energy grid.

I wanted to ask you, Dr. Unruh Cohen, can you speak to the ability of clean energy resources and technologies such as hydropower and hydropower storage, to bolster the resilience of our grid as we transition to clean energy?

Dr. UNRUH COHEN. Thank you for the question, Congresswoman, and hydropower has been an incredibly important power source for the history of our country. I mean, it was the first power source for our industrial work up in the New England and the Northeast. And it continues to be critical.

And I think the important thing to consider for this committee, and especially looking at the investments that we have made in dams over the past few Congresses, is the water cycle is very sensitive to climatic change, and so that is—we are going to see challenges to hydropower.

Unfortunately, our friends in the West are really seeing that challenge now with the Colorado River level, but it impacts in the Northeast too.

And so, in order to continue to provide that incredibly important clean energy from hydropower and from pump storage, we really need to look at the investments and make sure we are maximizing the clean power that we are getting from our dams around the country.

Ms. KUSTER. Yes. And I just would add, this pumped hydro storage, I was out in Mr. Curtis' district in Utah and meeting with a company there that is interested in pumped hydro storage, and how that can help with baseload and with peak and how we manage that.

So my time is limited, but I will just say it is important that this committee does not overlook the potential of our Nation's hydropower resources to deliver abundant, reliable, clean energy. It exists. We have 90,000 dams. Some of them can be retrofitted with turbines.

So I remain committed to pursuing holistic and comprehensive policies to bolster our hydropower-generating capacity and to ensure our Nation's energy independence, and I hope that will be on a bipartisan basis with our committee.

I stand ready and willing to work with each of my colleagues here today to make good on these promises for the American people, and, Mr. Chairman, I yield back.

Mr. JOHNSON. The gentlewoman yields back, and I thank you.

The Chair now recognizes the gentleman from Florida, Dr. Dunn for 5 minutes.

Mr. DUNN. Thank you, Mr. Chair. I saw an interesting fact yesterday. The EIA projects a 50 percent increase in world energy use by 2050. The U.S. should be the global leader in innovative technologies to maximize efficient energy production, be at the forefront of filling that demand.

Entrepreneurial spirit drives innovation, but overly proscriptive policies from the Biden White House are drowning American innovators with burdensome regulation. This puts our economy and our national security at risk, as Mr. McNally pointed out a few minutes ago.

This is why I will be focusing on combating the administration's radical energy policies that destroy American leadership in the energy space.

I look forward to working with my colleagues on policies that will unleash American innovation and return America to the forefront of energy production and unlock resources for future generations.

I have to pause for a moment to say, Ms. Jackson, it is great to see you again. We have talked a lot just recently. I hope to see you in Tallahassee before too long, or your team at least.

But a first question, Mr. McNally, I am going to give you this question, and Mr. Dabbar, I would like you to answer after him.

American innovation is driven first and foremost by ideas. Those innovative ideas then must be supported by efficient allocation of capital investment. This administration's policies and the private-sector ESG ideology are stymieing rational capital investments in the energy sector, specifically oil and gas but also in renewables and in the nuclear field.

Capital allocators direct their investments to renewable technologies because they are supported by favorable government subsidies. Mr. McNally, do you feel that the current administration's policies and the ESG investing are obstacles to American innovation and development in energy?

Mr. MCNALLY. I do. I think that the administration is signaling that it doesn't want to see capital flow into oil and gas production at a time, as I mentioned earlier, when we are in the foothills of what I believe will be a multiyear boon cycle where we are going to want every drop we can.

They are doing that on based on the idea that we need to enforce disclosure, or raise the cost of capital based on carbon and climate change and so forth. As I stated in some of the papers I will be submitting with my testimony, we need a sound and serious climate policy starting with depoliticized science, cost-benefit analyses, legislation, not regulatory rules and courts.

Well, we should do that first, and then, if as a result of that, we need to start telling capital where to go and where to deploy, maybe we consider it down the road. But that is——

Mr. DUNN. You got to be careful. You cautioned us on that earlier, be careful how you ready-shoot-aim, right, thing.

Mr. Dabbar?

Mr. DABBAR. Dr. Dunn, I have always had a view that the best place for Federal investment is in discovery and new innovation that is too far away from cash flow for the venture capital community and the corporate community to invest.

The private sector, luckily, in this country is still vastly larger than the Federal Government, and the amount of capital is widely available for things that can be applied. And the better use for Federal money is where the private sector doesn't see anything quite yet to invest in, and therefore discovery, science, and innovation in new things is more efficient for the Federal spending.

Mr. DUNN. OK. Very good. And on that subject, Mr. Dabbar, I am going to ask you to spend the rest of this time opining on what we can do to make America a global leader in the nuclear energy technology. And this is a pointed question because we have a large gathering of the nuclear industry this evening, so take it away.

Mr. DABBAR. I think the advanced development reactor program that was passed here a few years ago has really triggered a lot. There is a lot of excitement within the industry right now, and I think that is moving along very well. So I think—I think Congress should be—has done a lot with that. I think——

Mr. DUNN. Is there more we should do?

Mr. DABBAR. I think that trying to find—that the U.S. system, trying to be maybe a first customer of some of that power, and once again, I said a little bit earlier, maybe TVA or WAPA or Bonneville should maybe look at being a first customer for some of the power coming off of those plants.

Mr. DUNN. True. And we have talked about it, using DoD a number of times.

Mr. DABBAR. Or DoD certainly.

Mr. DUNN. Yes. So I like these ideas. Thank you all, all the panelists, for coming.

Mr. Chair, I yield back.

Mr. JOHNSON. The gentleman yields back.

The Chair now recognizes the gentlewoman from Delaware, Ms. Blunt Rochester, for 5 minutes.

Ms. BLUNT ROCHESTER. Thank you, Mr. Chairman. Congratulations to all of the new Members and congratulations to Chairwoman McMorris Rodgers, and thank you to all of our witnesses.

I have been proud to support and vote for the Bipartisan Infrastructure Law and the Inflation Reduction Act, which made historic investments in our clean energy future.

These investments not only help to expand domestic clean energy, they also help to diversify our renewable energy sources, which is a key to building a resilient and sustainable clean energy system.

Before I start with my questions, I would also like to note that I was pleased to see in the testimony of Ms. Jackson and also hear from Dr. Unruh in her testimony a positive recitation about former Energy Subcommittee Bobby Rush's, his work on increasing diversity in the energy industry. This is really important to me.

And while I was disappointed that we could not find bipartisan support and agreement in the last Congress, I really would love to see a compromise, and I am hopeful that in the 118th Congress we will focus on workforce and jobs.

As a former secretary of labor in Delaware and the former CEO of the Urban League in Delaware, this issue is an incredibly important one, and during this Congress I will continue to work on that issue, starting on creating programs within the Department of Energy to meet the workforce needs of the energy sector, and also to further train and get more people in the underrepresented communities into the energy workforce.

It will lower the cost for those individuals that are in communities that are underrepresented and communities of color, and it will also increase opportunities and salaries. These are jobs that are good-paying jobs.

I also want to address my questions mainly to you, Dr. Unruh Cohen. We have heard a lot today about energy production, but I also want to emphasize the importance of energy efficiency, again, back to the lowering costs.

The global energy demand is only going to grow, and we need to focus on initiatives that optimize energy. Can you discuss the importance of energy efficiency when we think of things like national security, our economy, and also public health? Can you talk to us a little bit about the benefits?

Dr. UNRUH COHEN. Thank you, Congresswoman, for that question. You know, the most important piece of energy is that what we don't use. So energy efficiency is actually our biggest energy resource if you look at our history since, you know, since the 1970s.

And it—energy efficiency is crucial for taking the edge off of those bills, for making sure that households are not making those hard decisions about paying their medical bills versus their energy bills. It reduces the use of energies all over, and so, you know, where we have pollution concerns, that is going to lower that, and just the less energy we use, the less dependent we then may be on international providers of that energy.

Ms. BLUNT ROCHESTER. Thank you. Transitioning to clean energy is not only necessary to protect human health and the environment, but it is also an enormous opportunity to create a more equitable economy.

Mr. Chairman, I ask unanimous consent to submit this report titled "Improving Equity Outcomes for New Federal Investments in Clean Energy Infrastructure" from the Bipartisan Policy Center into the record.

Mr. JOHNSON. Without objection, so ordered.

[The information appears at the conclusion of the hearing.]

Ms. BLUNT ROCHESTER. Thank you, Mr. Chairman.

And, Dr. Unruh Cohen, can you discuss how clean energy investments from the Bipartisan Infrastructure Law and the Inflation Reduction Act will help build a more equitable economy?

Dr. UNRUH COHEN. Yes. In both of those bills and through the Biden administration's initiatives, you know, there is a huge focus on making sure that communities that are building out the clean energy, that those jobs are flowing there.

Earlier, we were talking about the weatherization program, and one of the benefits there is not just to the people living in the house being more comfortable, but also the job training and getting, you know, skills—doing skilled training for those workers.

I mentioned my mom benefited from that, and she loved talking to the young men who were there doing the work and learning about, you know, what—the skills they were building up in their hopes for the jobs that they would have in the future.

Ms. BLUNT ROCHESTER. Mr. Chairman, I thank you for the time. I just want to add that I think this is an area where I have seen young people, older people, people of color, different communities come together and recognize that we have got a lot of opportunity here, and so I hope as a committee we take up this opportunity. Thank you, Mr. Chairman, I yield back.

Mr. JOHNSON. The gentlewoman yields back. The Chair now recognizes the gentleman from Utah, Mr. Curtis, for 5 minutes.

Mr. CURTIS. Thank you, Mr. Chairman. It is a delight to be here. A little warning to my staff: I am not delivering the remarks that we worked so hard to prepare, but rather my impressions of being here for several hours with all of you today.

I couldn't help but think if an alien was listening to us today, they might conclude that those on my left hated fossil fuels and would stop at nothing to stomp them out. Likewise, they might surmise that those of us on the right want to go crazy with fossil fuels and do nothing else.

To any alien friends that are listening, I have some good news and some bad news. First the good news. Despite the dialogue, there are many areas of agreement between those of us on the right and the left.

Representative Peters has pointed out the need to deal with NEPA reform and permitting reform. Representative Ruiz has pointed out the rich natural resources—I have heard him talk many times—in his district that we will desperately need.

Representative Duncan has addressed nuclear. Many of us agree that nuclear is part of our future and that we can't have a reliable, affordable, clean future without it.

We all like emerging technologies like hydrogen fusion and better battery storage. We all agree, actually, that wind and solar are important. We may not agree on the mix, but we all agree that they are important. We all agree we don't want to lose to China.

And, Ms. Cohen, we all agree energy efficiency is important.

And, Ms. Jackson, I don't know anybody that would listen to you and would disagree that we have to take into account those who are least able to afford this.

And rather than ask you all, I will just take your nodding heads in agreement that we are on the same page. This was a list quickly put together by me. I am sure there is much more.

But now the bad news. We spend too much of our time in the areas where we disagree. And for those of us on the right, we feel there is too much misrepresentation of our position, and I have no doubt my friends on the left would feel the same way.

I don't speak for either group, but let me say this: I don't know anyone in my circle—and I represent oil and gas and coal, I lead a group of almost 80 Republicans that talk about climate—I don't know anyone in my circle who doesn't want to leave a clean Earth better than we found it, who thinks it is OK to leave something for our grandchildren not as good as we found it. I don't know anyone who thinks that more pollution is better than less pollution.

At the same time, those I hang around with think that it is wrong to demonize fossil fuels and those that produce them. As far as I know, all of us in this room are highly dependent on fossil fuels.

I don't know any energy expert anywhere, right or left, who won't tell you that we will be using fossil fuels in the year 2050.

I think this is the problem: We too often mistake fossil fuels with emissions. We need to be clear. Do we hate fossil fuels, or do we hate emissions?

I challenge my friends on the left to substitute their anger with fossil fuels with that of emissions, and then I ask this question: If fossil fuels can compete with other energy sources in cleanliness, why do we insist that they die? Why do we demonize the very people who have produced these for decades and decades? Why can't they be viewed as part of the solution and not the problem?

On my side, we see hypocrisy like posing in an electric Hummer and bragging about it. The reality of it is, a gas Chevy Malibu produces as much greenhouse gas emissions, lifecycle, as an electric Chevy Hummer.

We see hypocrisy of shutting down Federal lands. My district, seven of my counties are 90 percent federally owned, and yet the President then goes to other countries, in many cases our enemies, and asks them to produce more.

To my colleagues who express they don't understand our approach, let me be clear: We believe we have been falsely told that we must sacrifice affordability, reliability, and national security so that we can be clean.

I believe we can have it all. I believe we can be energy independent. I believe we can be reliable, affordable, and clean.

Now, if we can get together and talk, I actually believe my colleagues on the left believe the same thing. And in the tiny 30 seconds I have left, I don't know if any four of you want to weigh in on that.

Ms. Cohen, you are the witness for the other side. Would you like to take my last 20 seconds?

Dr. UNRUH COHEN. I will just add, Mr. Curtis, that in the select committee, across the aisle, we actually would often agree on the challenges that the country faced, and sometimes we agreed, as you said, on the opportunities to solve those. And other times, we had disagreements. And I encourage this committee to, as you said, focus on the things maybe you agree.

Mr. CURTIS. Thank you. Regrettably, I am out of time. I would love to have you all share your thoughts, but I yield my time.

Mr. JOHNSON. The gentleman yields back. The Chair now recognizes Mr. Veasey from the State of Texas for 5 minutes.

Mr. VEASEY. Mr. Chairman, thank you very much, and so glad that we are holding this important hearing today, particularly on energy security. I think that energy security, our environment, the air that we breathe is something that we can never, quite frankly, talk enough about.

And one of the things that have really been worrying me lately is China. We know that China has been under very strict COVID lockdown. They are probably going to, quote/unquote, "reopen here" sometime soon. And I was hoping that maybe Mr. McNally could tell me what he thinks China reopening is going to do as far as prices are concerned, what sort of upward surge in prices might that impose on the American public?

Mr. MCNALLY. Yes, sir. Congressman Veasey, thank you for the question. That is my bread and butter. So oil prices, or pump prices, have been in a tug of war between this Russian disruption risk, which makes them go up, and this macroeconomic weakness risk, which makes them go down.

China was on the macro weakness side until the end of last year because, as you noted, they were in severe lockdowns, their demand was depressed, and very importantly, China is a big exporter of refined products like diesel and gasoline. That helped gasoline prices get to $5 a barrel.

However, sir, to your question, as we come into this year, President Xi has decided to let COVID run rampant, burn through, so that by the second quarter we and most analysts think that China will be recovering back to its pre-COVID demand level. That means close to about 16 million barrels a day.

The big chunk that has to come back is jet fuel if they let their citizens start to fly. So that would, all else equal, put upward pressure on prices. You have seen prices started to rise.

Now we have to go back and look and see what happens with Russia because, like the boy who cried wolf, we didn't see the disruption last summer, but we might going forward.

So China's return has sort of switched sides in the tug of war from being a downward price factor to being an upward price factor, sir.

Mr. VEASEY. Yes. And some reports are even saying that we could get to about 101 million barrels a day, which would be a record for the world.

And so one of the things that I have heard a lot from my friends on the other side, on the majority side, is that we need to unleash all of this energy that we have, and, you know, I am proud to say that as a Texan, you know, we do a pretty good job of unleashing.

Not only have we revolutionized things in the fracking area, but we have also been one of the world leaders when it comes to renewable energy. About 25 percent or so of ERCOT's grid is renewable energy. So I think that we are doing it right there.

But when I hear about unleashing American energy and being energy independent, one area that continues to really hurt the U.S. Congress and we haven't been able to find any sort of compromise on is the issue of immigration.

And if you talk to people in the Permian Basin and you talk to people that run the oil and gas companies, a lot of people don't realize this, but the permits that ranchers use, agriculture, the permits that hospitality use, those same immigration permits are not the ones that are needed for people to have temporary work visas in the oil and gas sector.

And so, when you talk to people in the oil and gas field, you know, people that say, "Hey, we need more swabbing units, we need more rigs," guess what? You ain't unleashing a thing unless you do something about immigration reform.

And so, when you hear people talk about being able to unleash, you can't unleash anything if the dog don't have a handler. So, please, can you please tell me, how are we going to unleash all of this energy potential if the other side is not willing to work with us on immigration reform and will continue to use this as sort of a wedge between the American people and offer absolutely no sort of solution?

Mr. MCNALLY. Congressman, I will step around the land mine of immigration and the border and so forth and just concur, though, that when I hear the same thing from my clients drilling in your State and others, that its input costs are really high, and part of that is finding good people.We are scouring Sri Lanka now. All over the world they are trying to bring workers in, and steel tariffs have raised the cost of steel and casing and so forth.

So there are real supply-side pressures that your constituents are dealing with, my clients are dealing with, and Congress ought to look across the board at how to alleviate those. But I am going to steer clear of immigration, sir, if you don't mind.

Mr. VEASEY. Yes. And before I get ready to turn back over my time, Mr. Chairman, I will just say that, if we really want to address this issue and we really want to unleash, we better do something about immigration reform because just saying "unleash" and not addressing immigration reform means absolutely nothing.

Mr. JOHNSON. The gentleman yields back.

The Chair now recognizes the gentlewoman from Arizona, Mrs. Lesko, for 5 minutes.

Mrs. LESKO. Well, thank you, Mr. Chair. I am really excited to be on the Energy and Commerce Committee and on the Energy Subcommittee and talking about energy, because it is vital to every aspect of our lives.

I represent the Phoenix, Arizona, area and its suburbs. And right outside of my district is the Palo Verde Nuclear Plant. It is the largest power producer in the Nation for almost the last 30 years.

Recently last year, Palo Verde Nuclear Plant in Arizona was awarded funds from the Department of Energy to increase its flexibility by creating hydrogen when selling to the grid isn't economical.

My question, Mr. Dabbar: What more needs to happen to increase the deployment of energy technology like hydrogen?

Mr. DABBAR. So we awarded the money around increasing hydrogen production across the nuclear facilities. Hydrogen is a storage vehicle. So if you think about it, the comparison, you produce electricity and you can store it in chemical form, or you can store it in gaseous form, in hydrogen. Or you can do it in liquids, as I was talking about earlier. And so, hydrogen has a great opportunity for an additional storage.

The other thing that is really exciting about hydrogen is that some industrial uses cannot really use electricity, OK? So the likelihood of electrifying certain industries is quite poor, right, around certain things like steel and concrete.

So if you can take that electricity and put it into something that can produce a much higher heat rate for that manufacturing, it is going to create an opportunity for those industrial to, quote, electrify, but it is electrified via converting it to hydrogen.

Mrs. LESKO. Exciting. That is the one thing I like about energy. A lot of new technology going on, exciting that I think can solve a lot of our energy needs in America.

Mr. McNally, in your written and verbal testimony, you recommended the establishment of a national commission on energy transition realism, an expert nonpartisan commission of renowned energy experts to advise government officials and evaluate policy options for energy transmissions.

I love it. I think it is common sense. Sounds like a great idea to me.

The United Nations Intergovernmental Panel on Climate Change, the UNIPCC, in a report issued last year pointed out that collectively the G20 members are not on track to meet their goals under the Paris Climate Agreement.

The UNIPCC also states in its latest assessment that global warming at the end of the century is estimated at 2.7 degrees Celsius, not even close to the Paris Climate Agreement of 1.5 degrees.

The Biden administration is spending trillions of dollars on solutions that are not working, according to the UNIPCC. Don't you think it is time the administration has an honest conversation on spending trillions of dollars on ideas that according to the UNIPCC aren't working?

Mr. MCNALLY. Thank you, Congressman Lesko. I certainly do. I see a sound and serious climate policy as having a foundation, like a house has a foundation, and the quality of the foundation will determine whether the house is safe to build in and live in and so forth.

And the foundation ought to be depoliticized transmission of science to nonexperts like all of us. And the concern with the IPCC reports, actually, and the summary for policymakers, the SPM, is the folks who are decoding the complicated climate science and explaining it to all of us are government officials, and they don't have the rigorous peer review and requirements to be transparent like you do in actual climate science.

So I would respectfully suggest that perhaps your side of the aisle—and make it very clear you embrace climate science. The problem is not climate science, it is how it is transmitted to the rest of us, because it is pretty complicated, in these IPCC reports.

And let's have reforms to make sure it is honest, peer-reviewed, and a good foundation upon which for us to debate sound policies to address the problem.

Mrs. LESKO. Fantastic. And in the 13 seconds I have left, thank you for being here once again and telling us—and representing low-income communities and minority communities and speaking up. Thank you. And I yield back.

Mr. JOHNSON. The gentlewoman yields back.

The Chair now recognizes Mr. Soto from Florida for 5 minutes.

Mr. SOTO. Thank you, Chairman. There are a few elephants in the room worth mentioning. The Washington Post reports today, "Oil companies post record-smashing profits as gas prices creep up." Record-smashing profits.

ExxonMobil: $55.7 billion in 2022, a record.

Chevron: $36.5 billion, 2022, another record.

Inflation, corporate greed, record profit, share buybacks—something this committee needs to keep in mind as we are navigating this.

Elephant number 2: Climate change demands our attention. Intensifying hurricanes, massive floods, prolonged droughts, rising seas, extreme heat, extreme cold. Climate is changing, and it takes more than just saying the word "climate" or delay, delay, delay, delay, delay to actually solve it.

The Inflation Reduction Act is now law. This committee should join the President and the Senate in shepherding the fair implementation of this landmark law, pursuing diversifying our energy production with clean renewable energy.

Number 3: exporting oil abroad. There used to be a ban on that, and now oil is being exported and Americans are paying high prices at the pump. This isn't an America-first policy. This is the exact opposite.

If you want to kick-start American energy dominance, we should start by looking at the exports that just started just a few years ago.

Under Secretary Dabbar, what do you think we should do about record oil profits at the expense of the American people?

Mr. DABBAR. Yes, Congressman, it is almost ironic that when—a few years ago, when we were the energy dominant side on the oil markets and the gas markets, that the oil and gas companies were actually making very low profits, and the biggest problems when that was going on, when we had so much production, was that they were—the prices had been dropped so much for the consumer.

And it is a funny dialogue, right, so that when we have been supportive of export terminals and pipelines and so on, that actually the oil and gas companies make less money and consumers actually pay less money.

But when we put lots of restrictions on them and there's lots of turmoil, prices go up and then emissions go up, right? Emissions are because of coal plants coming online, especially in Germany. So it is a funny dynamic around those different issues.

Mr. SOTO. Well, thanks. I appreciate you describing the issue, but it would be helpful for some solutions on it.

Dr. Cohen, a key role for this committee is implementing the $369 billion in incentives to boost renewable energy, boost conservation. What are some of the things you think this committee can do to help with that fair implementation?

Dr. UNRUH COHEN. Thank you for the question. We have talked a lot about the importance of the grid, and both the infrastructure bill and the Inflation Reduction Act have important provisions to help improve the resilience of the grid and expand it. I think that is an area that this committee can give some really close attention to.

In addition, there are a number of other—we have also talked about nuclear power, and both the Infrastructure Act and the Inflation Reduction Act provide ways to keep our current nuclear power—to support currently operating nuclear power plants that are safe to operate. I think taking a look at that will be important, so we keep that carbon-free emission coming.

And then, as we talked about, just the deployment, making sure the deployment of wind, solar, the electric vehicle infrastructure is happening.

Mr. SOTO. Thank you so much, Dr. Cohen. I, like many on this committee, agree it should be an all-of-the-above solution and we should look at different sources of energy.

I hope the mistakes of the past with the Affordable Care Act of trying to eliminate it for many, many years, only for it to continue to be the law of the land—over 3 million Floridians now get their care from there—that we learn from those mistakes when we look at the Inflation Reduction Act knowing that it is the law and will be the law for the foreseeable future. And rather than trying to undermine it, we should work together on maximizing it.

And under the Inflation Reduction Act, we do have incentives for things like modular nuclear and carbon capture in there. So for colleagues who are talking about it as if it is all just renewable energy, that actually is false. There is a great opportunity for us to work together to pursue these in this committee, and I yield back.

Mr. JOHNSON. The gentlemen yields back.

The Chair now recognizes Mr. Crenshaw from Texas for 5 minutes.

Mr. CRENSHAW. Thank you, Mr. Chair. Thank you for hosting this hearing. Thank you all for being here. You know, we heard earlier that Republican priorities were misguided, and that was a little shocking because I think our priorities are guided quite well and are very clear, and they are this: Provide energy to the American people that fits three criteria: reliable, affordable, and clean.

I don't think that is very controversial. Reliability is number one, of course, it has to be, because energy production is pointless if it isn't reliable. A society cannot function if it cannot keep the power on.

Affordability is second. Americans need to be able to afford reliable energy without massive government subsidies so they can drive to work, heat their homes, and benefit from a thriving economy.

Third, Republicans want our energy to be clean, and yes, we can have energy that is reliable, affordable, and clean. It is possible.

Also worth noting that America's natural gas revolution is the single largest factor in reducing America's carbon emissions. Switching from coal to gas accounted for 61 percent of emission reductions in the U.S. since 2005.

If we cared about global emission reduction, we might note that the U.S. natural gas is 42 percent cleaner than Russian natural gas, which is why Republicans advocate for more natural gas exports to displace foreign coal, which, by the way, accounts for about 50 percent of total global power emissions. Seems that would be some pretty low-hanging fruit if carbon emissions was actually the goal.

Also worth noting that Republicans are by far the strongest supporters of nuclear energy, which is both reliable and 100 percent clean. Maybe our colleagues would join us in fixing the outdated permitting process that makes a 4-year project last for 15 years.

My Democrat colleagues mostly just want to talk about wind and solar, which isn't reliable and only affordable if you subsidize it. They say we can just build a bunch of batteries to deal with the intermittency problem of renewables. They say we can clear hundreds of square miles of land for solar and wind farms and pay China to mine and process all of our critical minerals so that we can pretend that we aren't actually responsible for the environmental devastation of Chinese mining practices and the enormous amount of emissions that result from processing it all.

So my question to my colleagues is simple: If the goal is actually reducing global emissions, then will you work with us to improve our absurd environmental permitting regulations that are choking off our ability to not only build pipelines, but also build the solar and wind farms and battery backup systems that you claim to care so much about?

I know some of them are, because my friend Scott Peters was just talking about it. And surely my colleagues would find it troubling that something like the Ten West Transmission Line, whose groundbreaking ceremony was attended by Vice President Harris last year, won't actually be online until 2025. The planning actually started in 2016, just for a simple 125-mile transmission line on public land. So that is nearly 10 years from start to finish, nearly 4 years of which was just to get the environmental impact statement approved.

We put a man on the moon in less time than that. Now, does that seem like a healthy permitting and regulatory system to anyone? Surely not.

It is not just transmission lines, it is critical minerals too. In Nevada we couldn't build a lithium mine because of some useless plant called Tiehm's buckwheat. I am not joking. You can look it up.

In Oregon we can't mine for lithium because of a sage grouse, which is basically just a fancy version of a chicken.

In Minnesota this administration halted the Twin Metals Project over vague environmental concerns. Now, this mine would have produced taconite iron ore, copper, nickel, cobalt, all of which are needed for any renewable energy project.

My point is this: The false narrative that we can transition smoothly to a wind-and-solar-only future is not based on anything that resembles reality. It is a fantasy, and it is a dangerous one that will quickly take us down the failed energy scenario that we now see in Europe.

Wind and solar certainly have their place, but when energy demand will increase by 50 percent over the next 50 years, intermittent renewables will never, ever, ever be enough, and it is time to let that fantasy go.

So am I promoting oil and gas? Yes, yes, I am. In fact the quickest way to reduce global emissions would be to ensure that our cleaner natural gas is displacing foreign, coal-fired power plants. That single feat would have a larger impact on global emissions than any other solution offered.

In fact, the industry thinks we could quadruple gas exports in the next 10 years, if we let them. If that gas displaced foreign coal, it would reduce emissions more than the combined impact of doubling our wind capacity, installing solar panels on every home, and electrifying every vehicle in the country.

So you want solutions for reducing global emissions, build pipelines, build export terminals, lease the land for drilling, and send some special trade reps to countries like India and Indonesia to make a deal. That is a realistic solution, and it is actually doable.

Reality has to guide our solutions for the future. We cannot sacrifice energy reliability for radicalism. We must be rational environmentalists, not radical environmentalists, and we have to remember that the prosperity of the American people depends upon reliable and affordable energy. And I yield back.

Mr. JOHNSON. The gentleman yields back.

The Chair now recognizes the gentlewoman from Minnesota, Ms. Craig, for 5 minutes.

Ms. CRAIG. Thank you so much, Mr. Chairman.

I am going to focus my attention here this afternoon on our Nation's biofuel sector and its role in strengthening economic, environmental, and national security, and I am actually going to ask you a question, so get ready.

As many of my colleagues know, I have been a champion on the Energy and Commerce Committee for expanding and enhancing this vital segment of our economy. For example, I was the first Member of Congress to pass year-round E15 through the House in the Lower Food and Fuel Cost Act last Congress, and I am eager to work with Chair Rodgers to pass an E15 fix again this year.

We should take up and pass the Consumer and Fuel Retailer Choice Act, which is bipartisan, bicameral legislation, that would allow the year-round nationwide sale of ethanol blends higher than 10 percent, helping to lower fuel prices and improve stability and certainty in the U.S. fuel market.

This bill was supported by the largest unified group of farming, biofuels, and oil companies to date, and I look forward to reintroducing the proposal in this Congress again.

E15 creates opportunities for our family farmers, supports economic growth in rural America, and lowers prices at the pump for Minnesotans. With this sentiment in mind, I want to direct a couple of questions to the panel for your thoughts and observations on biofuels policy and where we go from here.

Mr. McNally, you recently spoke, I believe, at the National Ethanol Conference about the future of liquid fuels and told the group to keep the faith, because there is no evidence that consumers or governments are on course to decarbonize as rapidly as the consensus expects.

In a minute or so, I am hoping you can talk more about those comments and why you predict American drivers will still be filling up with home-grown biofuels for many years to come. So why don't we go ahead and ask you to comment on that.

Mr. McNally. I will have to talk very quickly, Congresswoman. Thank you very much for the question. The consensus has decided to believe that liquids fuel demand—so gasoline and ethanol, biofuels—is going to peak globally in about 10 years. This is a very controversial, in my view unjustified if perhaps attractive, vision.

If you believe that, that means demand for biofuels and oil, because they go together, is going to plateau and go down. In my view, that consensus is wishful thinking, and that demand for energy is going to grow much stronger than that, including liquid fuels, which means there will be a bigger pie for gasoline and diesel, which biofuels complement.

Ms. Craig. Thank you so much.

And now, Dr. Cohen, the Select Committee on Climate Crisis recommended that Congress and specifically this committee develop a low-carbon fuel standard to build on the renewable fuel standard.

I have been a cosponsor on the Next Generation Fuels Act, which would gradually ramp up the use of home-grown ethanol at gas stations across the country, making Americans less reliant on foreign oil and less vulnerable to the anticompetitive tactics of OPEC.

I am wondering if you can speak a little more about the design of a low-carbon fuel standard and why the time is right to begin this important work here on the Energy and Commerce Committee.

Dr. Unruh Cohen. Thank you for the question, Congresswoman. I actually was able to work on the 2007 energy bill where we did the renewable fuel standard, which is now in need of reauthorization. So the time is right for this committee to take a hard look at our biofuels policy.

We recommended doing a low-carbon fuel standard. We have seen that work for transportation fuels, the agriculture community out in California. It would be a way to take the holistic view about our liquid fuels and provide that signal and that standard to move towards lower carbon fuels.

I agree with Mr. McNally, we are going to be using liquid fuels. We invested in sustainable aviation fuels in the recent laws, and so we need to provide the signals to producers so that we are getting the type of transportation fuels we need to meet the climate pollution reduction goals that we know we need to achieve.

Ms. CRAIG. Well, I would just like to end by saying thank you to all the panelists, I know it has been a long day for you. And with that, Mr. Chair, I yield back.

Mr. JOHNSON. The gentlelady yields back.

The Chair now recognizes the vice chair of the Environment, Manufacturing, and Critical Minerals Subcommittee, Dr. Joyce from Pennsylvania, for 5 minutes.

Mr. JOYCE. Thank you, Mr. Chairman. I thank all of the witnesses for being here today. Realize that Energy and Commerce, the first formal hearing that we are holding, is directed to energy and how that unleashing of American energy is so important.

As we begin the 118th Congress, this hearing is the first chance for Energy and Commerce Republicans to begin tackling the issues that are facing all American people. It is great to be back together with my colleagues in one room to do the job that our constituents sent us to Washington to do.

Our new Republican majority is ready to enact the commitment to America. A core piece of that plan is to ensure that our Nation has a robust and a reliable energy supply. Let's be clear—and you have heard us say it repeatedly—energy security is national security. Our physical and economic well-being is tied to maintaining energy.

Ms. Jackson, your words resonated with me. You messaged to us how important that energy sources at affordable prices are to all Americans and how the high cost of energy is certainly having more impact on lower socioeconomic Americans and how that impact affects each individual American every day of the week.

American policymakers in front of you have recognized that reality, and it is why the Department of Energy was established in 1977, in order to decrease our reliance on foreign adversaries.

After years of energy development under both Republican and Democrat Presidents, our Nation finally had achieved that goal. But under the last administration, energy had superceded that goal. We were an energy exporter. We were energy dominant—energy dominant—supplying those necessary energy forms to our friends and to our allies.

You know what, sadly, it is no longer true. The Biden administration has waged a war on American energy industry by creating restrictive and burdensome regulations that have left us less secure and more exposed to bad actors.

It has focused on poor alternatives, like wind and solar, instead of baseload power capacity, has made our grid less reliable and less resilient. This becomes clear in my district in Pennsylvania when I heard from constituents that they were asked by their utility companies over the Christmas holidays to conserve energy or risk outages.

I will tell you, it is shocking. It is shocking in the State of Pennsylvania, where we have strong energy portfolios—we have coal, we have natural gas, we have nuclear, and they all play critical parts in the Commonwealth's electricity supply.

Generations of Pennsylvanians have gone into coal mines to power America, and new drilling technology has enabled an explosion of natural gas production from the Marcellus Shale industry.

It is unacceptable that in a State and in a nation as blessed as we are with natural resources for our citizens to be at risk of blackouts because of bad government policies.

Now is the time to abandon these failed policies and unleash the reserves, the reserves that are under the feet of my constituents in Pennsylvania.

With our new House majority, Republicans are ready to begin implementing policies that will allow new leases for oil and gas production, reform the permitting process for energy infrastructure, and prevent burdensome government regulation to reclaim American energy dominance.

My first question is for you, Mr. Dabbar. Can you speak on how critical it is for grid reliability to have baseload power capacity, and how does the closing of coal and natural gas power plants in favor of renewables affect that grid resilience?

Mr. DABBAR. Yes, Congressman. Until, you know, relative recent past, during the last kind of 20 years, almost all the power plants in the country were dispatchable, whether it was hydro or gas or coal or nuclear. And the advent of wind and solar, which are great at emissions, has increased instability in the grid.

Lithium-ion is great, but it is only good at the edges on the grid. It doesn't come close to having other peaking sources.

Mr. JOYCE. And how would—I am going to interrupt if I may—how would government policies forcing electric vehicle adoption further strain the grid?

Mr. DABBAR. Yes, Congressman. So, obviously, electrification overall, and EVs are certainly a big part of it, are adding more demand. And what we are seeing is that, on the supply side, more power plants are being shut down than are being built, and the ones that are getting built are less available.

So that's increasing risks in our system and as a result is actually increasing prices. In New England the electricity prices were a hundred percent on the energy side above where it was a year ago.

Mr. JOYCE. Thank you. I appreciate all of you being here, and I yield.

Mr. JOHNSON. The gentleman yields back.

The Chair now recognizes the gentlelady from Washington, Ms. Schrier, for 5 minutes.

Ms. SCHRIER. Thank you, Mr. Chairman. I am delighted to be back on this committee, and let me just also say that it is a special privilege to work with my fellow Member from Washington State, our new chairwoman of the committee.

You know, I agree with my Republican colleagues here that high and volatile energy prices are a real problem. They are a problem for my constituents, who, by the way, are still paying in many areas over $4.50 a gallon for gas. Prices are coming down, but they are not down enough.

My colleague, Mr. Soto, just talked about, he called it "record-smashing profits" once again by the oil and gas industry, and so I would just like to continue to call out what sure feels like price gouging. And that is why last Congress we passed my bill, the Consumer Fuel Price Gouging Prevention Act, through the House, and I hope we will take that up again.

I wanted to pivot to national security. I think Russia's war on Ukraine has really highlighted and refocused our attention on how tightly tied our energy independence is to our national security, as we are watching what is happening in Europe.

National security is not just geopolitical, though. It is also security from the fire and the weather disasters that we are experiencing more and more frequently all across this country, and with that in mind, and also sort of conjuring up what Mr. Curtis said, like, I think we can all agree that we need to be bringing down emissions and we need to be transitioning away from fossil fuels toward cleaner sources of energy.

And I would add, Mr. McNally, you mentioned that even with so much domestic production of gas and oil, we still have extreme price volatility. And so, there's many reasons—energy independence, where we need to transition, stability in energy prices, pollution prevention, climate action, national security. That all should make us want to redouble our efforts here to move away from 20th century energy sources to the energy sources of the future, and the U.S. needs to lead here, not China.

We took tremendous action last Congress in really putting in incentives, economic incentives, to boost innovation here, hydrogen hubs, battery manufacturing. It really supercharged research.

And by the way, I will also note that some of the things that were in that bill, Ms. Jackson, would help individual customers afford heat pumps and other innovations that will help with energy efficiency and to bring down those monthly bills.

I also note it is because of clean hydropower that Chairwoman McMorris Rodgers and I pay some of the lowest electricity costs in the Nation.

So I wanted to just ask, Dr. Cohen, in your testimony, back to national security, you noted that China leads the globe right now in clean energy investments. I think we all know that this is not because they are great environmentalists. They are doing it because that is where the future is, that is where the money is.

Can you talk about why the United States needs to catch up, surpass, and lead in this area?

Dr. UNRUH COHEN. Thank you for the question, Congresswoman.

And just going back to your point on the consequences of the climate change, I mean, the western wildfires, they don't just stay in the West. Everybody, you know, has the health impacts that come from that, from the burning of those forests.

But to your question about China, in 2022, you know, China invested about $546 billion in clean energy transmission, and the U.S. was a distant second at just $141 billion. That was pre—that doesn't count what we just passed, so we expect that to change very quickly.

But as a number of people have mentioned, increasingly every country is looking for energy security, and so they are looking at what can they do domestically, which means they start looking at what can they produce from a renewable energy. And we—I quoted it, Congresswoman DeGette quoted it. BP's economist has said, you know, we are seeing that. And we have seen a huge change in Europe in the face of them realizing they can no longer rely on Russia for energy.

Ms. SCHRIER. Thank you.

And that is why we need to be doing the innovation that this committee will do. We are at the crossroads right now where we can't depend on China for those resources. We need to do the mining, the recycling, and everything else that it will take to invest in ourselves here at home.

Thank you. And I yield back.

Mr. CURTIS [presiding]. The gentlewoman yields.

I recognize the gentleman, my colleague from North Dakota, Mr. Armstrong.

Mr. ARMSTRONG. Thank you, Mr. Chair.

We need to level set and be honest about the use of energy on the planet and its importance for economic growth and national security. Next year, regardless of any policies pushed by the Biden administration, the world will use more carbon energy than it did this year, and the year after that and the year after that.

In the United States this administration has taken a whole-of-government approach to dissuade development. But in Europe we are seeing a realignment accompanied by substantial long-term investment in carbon energy as countries try to make up for Russian supply chains. The Norwegian Energy Ministry has proposed putting 92 new offshore oil and gas blocks on offer in its next licensing route. And Spain has laid the groundwork to become EU's national gas hub. They have the capacity to onboard it. They just need to move it. Germany is building an infrastructure to support up to 56 billion cubic meters of LNG import capacity, roughly the same amount imported by pipe from Russia in 2021.

Given the right regulatory environment, these investments are for the long term. Despite past rhetoric, there is an awakening in Europe that energy security is essential to national security and economic growth.

And there are lessons to be learned from Europe, and if we don't think the challenges there are relatable to the United States, we only have to look to the Northeast, where natural gas availability is threatened by an artificial supply crunch. Like Continental Europe, natural gas is shipped in from producing areas.

However, unlike countries such as Spain and Germany, Northeastern States have yet to recognize the threat posed by unreliable access to energy, despite warnings from grid operators, industrial users, and utilities.

At nearly every opportunity, the permitting and certification process for carbon energy infrastructure have been mired in legal and regulatory entanglements. And worse yet for my friends who support green energy, we have taught them how to stop those projects as well.

You don't have to look any farther than the Northern Pass Pipeline, which is trying to bring hydropower from Montreal to Boston, and it cannot get built in any State on the Northeast corridor. Do you know who shut it down? Indigenous Tribes in Canada and the Sierra Club.

From the defeat of the Constitution Pipeline to the cancellation of the Northeast Supply Enhancement Project, years of coordinated activists and environmental opposition have prevented the construction of 1,000 miles of interstate pipeline across the Northeast. Instead of expediting deployment of the necessary infrastructure to move abundant energy resources, Northeastern States, supported by an antagonist Federal regulatory environment, have done everything in their power to actually halt that development. Since day one, the Biden administration has taken that playbook and applied it on a national scale.

Last month, through an overly vague and expansive definition of waters of the United States, the Biden administration further empowered activist environmental entities within States to abuse the Section 401 certification process to stifle pipeline development for political reasons.

Now, only a few weeks later, a new guidance from the Council on Environmental Quality will further muddy the waters as agencies evaluate greenhouse gas emissions and climate change when considering proposed actions under NEPA. Under this latest proposal the Council on Environmental Quality is pushing for agencies to use the NEPA process to link decisions with the national climate change agenda, connecting NEPA reviews to environmental justice, pushing arbitrary alternatives, and providing a new pathway to consider both upstream and downstream emissions.

While it remains to be seen how this new guidance will play out, it almost certainly will further slow the development of much-needed energy infrastructure projects and drive capital away from the carbon energy resources.

Under Secretary Dabbar—and I appreciate what you said about the lithium ion battery, because when we figure out a better way to store electric energy, it will have as great of an impact on our economy as the steam engine or the microchip. The problem is that the lithium ion battery ain't it.

But in your testimony you talked about the need for reform of FERC as part of the permitting and approval process. Can you walk through how the activist capital, combined with FERC straying from its statutory charge, has distorted the marketplace for carbon energy infrastructure?

Mr. DABBAR. Yes, Congressman. So, as you laid out, the very, very long approval processes are effectively a tactic to never build, right, for the people who are building. That is what it is.

And, you know, in the last administration, actually, you could see if you put a time stop, if you may remember. It was, like, it is not a yes or a no, but it is you got to get it done it in a certain period.

Mr. ARMSTRONG. I called it an unreasonable amount of time.

Mr. DABBAR. And so I think some sort of—and Congressman Peters talked about NEPA reform. I think one of the key things that's holding up things from getting built is the incredible long time period from the time that you—that someone, a company tries to lay it out to the approval, plus the inflation, right, the inflation makes projects with a long delay undoable economically at the end of the day.

So I think some sort of time stop on a NEPA review, you know, of the reform. That doesn't say it has to be built or it is going to be approved or not approved. It is just do something reasonable from a time period, I think, is good for everything.

Mr. ARMSTRONG. Thank you.

And I yield back.

Mr. CURTIS. The gentleman yields.

The Chair recognizes the gentlewoman from Massachusetts, Mrs. Trahan.

Mrs. TRAHAN. Thank you, Mr. Chair.

So I don't think we can have a hearing about unleashing our domestic energy supply and not mention the record profits the big oil companies are about to announce from last year. Five massive oil corporations are slated to earn a combined profit of almost $200 billion.

These same companies sat here before this committee last year, and they groveled for more drilling permits so that they could lower prices. Apparently, they couldn't use any of those profits to start drilling on the thousands of permits they already have, and they couldn't allocate another dime to restart the refineries that they shut down. But you bet they used those products for stock buybacks, to inflate their share price and make sure they got their multimillion-dollar bonuses.

Mr. Chair, I agree with you and members of your party that we need to achieve energy independence. We need to stop relying on the whims of OPEC, but we can't swap foreign oil oligarchs for domestic oil barons. We can't trade Vladimir Putin for ExxonMobil if they are going to keep doing the same thing, influence the market to pad padding their profits while working families pay the price.

Mr. Chair, the American people want lower energy costs and a planet that their kids can inherit. To achieve that goal, me must focus on sustainable alternatives, and we are close to having one, in particular, that will change energy as we know it.

Recent breakthroughs, including most recently at Lawrence Livermore National Laboratory, have finally put fusion energy within reach. Unlocking this virtually unlimited source of clean energy will drive down costs for families struggling with gas and oil prices. It will reduce our carbon footprint and help ensure a healthy future of our planet for generations to come. But it won't happen without building on the public- and private-sector investments in research and development that have gotten us to this point.

So, Dr. Unruh Cohen, first, thank you for your incredible work over the last two Congresses.

In your testimony you mention that U.S. public-sector investment in clean energy trails other countries, including China. The Department of Energy is considering applications from private fusion companies for $50 million in public/private partnerships and a new milestone-based funding program that would support building fusion pilot plants. But according to the Fusion Industry Association, the funding opportunity announcement was significantly oversubscribed with applications requesting close to three times as much funding as was allocated.

Can you just tell us why public investment in fusion energy is so critical for accelerating the impact of existing private investment in the United States?

Dr. UNRUH COHEN. Yes. Thank you for the question.

And I spent a lot of my career working for Ed Markey, both in the House and the Senate. So I am very familiar with the great clean energy technology in Massachusetts and the companies that are spinning out from that, and fusion is one of those. Obviously, you have got a great one there. And, you know, the promise of fusion is amazing, and we have spent a lot of important research, Federal research dollars going into that. We have had these really exciting breakthroughs, and I know, you know, we are on the cusp of being able to understand the potential there more and, hopefully, move forward to commercialization. I hadn't realized it had been oversubscribed. I hope that is something that this committee and the Appropriations Committee can work on to see if there are more resources available for that.

Mrs. TRAHAN. Same—did you want to add to that?

Mr. DABBAR. So, Congresswoman, probably one of the leading fusion companies in the country or world is in or around your district in Devens. I think that plant is going to—when it comes on line in 2025 will well outperform what happened at Livermore. They don't like to talk about how much, but I have a pretty good idea.

I ran a fusion energy program for the country. We decided when we were there to engage with the private sector where DOE had not engaged with the private sector before. We had to, you know, break a little glass on that.

I think the milestone program that we started, that we started moving along needs to be expanded. And I know that some of the proposals in Build Back Better had made that larger. I would highly encourage that we take the momentum on technology, innovation in particular, in your State and your district but elsewhere, and I would recommend that everyone here look at expanding that.

Mrs. TRAHAN. And I look forward to bipartisan work on that. I mean, I will leave the committee with this. The Nuclear Regulatory Commission recently released their options for licensing and regulating fusion energy systems which highlights the important safety and security benefits of fusion energy: No high-level nuclear waste, no chance of a meltdown, no special nuclear material like plutonium or uranium. But the paper also leaves some regulatory ambiguity suggesting that future fusion power plants may be regulated like fission, which is a very different energy process.

So I look forward to making sure that we put the right regulatory in place, environment in place so that we don't stifle that innovation as it is coming to bear.

Thank you. I yield back.

Mr. CURTIS. The gentlewoman yields.

The Chair recognizes the gentleman from Texas, Mr. Weber.

Mr. WEBER. Thank you, Mr. Chairman.

First I want to correct something that was said earlier by Scott Peters. He said in Texas 40 percent of our power is renewable. That is just not accurate. You go to EIA.gov, Energy Information Administration, look at that, and Texas is 50 percent natural gas. It is 18 percent coal. Nuclear is 8 percent. And that is 76 percent. I am not good in math, but that leaves about 24 percent: 20 of it is wind, and 4 percent is solar.

So we appreciate renewables in Texas, we do. But the real important fact is that the renewables cannot be the leading actor. Renewables can be a supporting actor, but renewables cannot be the leading actor. We found that out in Winter Storm Uri.

You all talked about pipelines, Mr. Dabbar. I think it was you and one of our Members. The Keystone Pipeline would have come into my district over by Beaumont, Texas. It carries 830,000 barrels of oil a day. The Colonial Pipeline system that you talked about carries about 3.1 million barrels of product a day. The Keystone Pipeline is literally one-fourth of the output what feeds the entire Southeastern part of the United States. Why didn't the President come to Texas and beg us to drill for more oil? It has been a real mystery to us.

Also, in my gulf coast district, I have Strategic Petroleum Reserve. We house also about 59 percent, not quite 60 percent of the SPR in my district. I have been watching it for a long time. I served 4 years in the Texas House. I was on the Environmental Energy Subcommittee, and I will tell you that—or Environmental Reg Committee, and I will tell you that we paid a lot of attention. Texas has 225,000 miles of pipeline. The pipeline industry has a 99.925 percent safety rating. We can move product safer than anybody else. We can store it in the SPR. We can have it ready for emergency, not because the President wants to bring down gas prices in an election year. I mean, he is trying to help. Maybe he is storing classified documents in his garage to keep from paying storage fees. I don't know. He is just trying to help.

But I just want to go to you, if I can, Mr. McNally. You made an interesting comment. You said an arsenal of energy is what we need. That is a great term. You talked about the things that we had—you talked about World War II attack, if I remember correctly. Americans need to know what is important and why we need to be energy dominant, energy independent. It is energy. It is absolutely energy safety. It is domestic safety. It is political safety. It is military safety. You just—economic safety. You just can't express how important it is.

For the President to draw down the SPR in an election year is totally uncalled for. I am told you are an expert on the SPR, and you sound like you are pretty knowledgeable about it. So my question to you is, in your opinion—and you have probably gone back and looked. I think the SPR capacity—it depends on who you talk to—is about 714 million barrels, maybe 730, depends on who you are reading.

In your opinion, what is the proper use of the SPR? And what is the history of it, if you know that far back?

Mr. MCNALLY. Thank you, Congressman Weber.

Yes, I think we topped out at about 725 million barrels. It is now down to about half that level. We are at a 40-year low, so it hasn't been since 1983 that we have seen it this low.

And it is really unfortunate, because in a way, in my view, it is a bipartisan mistake to start to sell off the SPR just to pay sort of regular expenses in 2017. We did the same thing in the mid-1990s, and I worked for President Bush after 9/11 when we restocked the SPR at higher prices.

So we kind of went around the circle once before. I was hoping we wouldn't have to do it again.

But, in addition to the mandatory nonemergency sales, which I think are very unfortunate but starting to reverse, President Biden, especially in November of 2021 before the Russian invasion of Ukraine, used it purely for political reasons. I mean, there was no disruption. The IEA wouldn't go along, and he had to beg China, of all people, of all countries, to go along with us.

And that is up there in the halls of infamy with the decision by President Clinton September 2020, 2 months before the election, to invite Al Gore to announce a release at that time too.

So with the emergency release in March of last year, at least we thought we were going to lose Russia. When it started out, we had a real emergency, we thought. But within a couple of months, we realized Russian supply wasn't going off. They should have suspended the sales at that point.

So we have a mixed history with the SPR. Fortunately, some Presidents have used it for purely political price control, very limited, by my count twice. We have had, no kidding, emergency releases. And I would again say the administration probably took the right decision initially, because we thought in March of 2022, the IEA said we are going to lose 3 million barrels a day of Russian supply in April, like 2 weeks later. Again, that wolf did not come into the village. We should have suspended those sales, but we did not.

Thank you for the question.

Mr. WEBER. I thank you for that.

And I yield back.

Mr. CURTIS. The gentleman from Texas yields.

The Chair recognizes the gentlewoman from Texas, Mrs. Fletcher.

Mrs. FLETCHER. Thank you, Mr. Chairman.

And I join in welcoming our new Members and congratulating Chairwoman McMorris Rodgers on her historic chairmanship.

And I am thanking our witnesses for being here today. It has been a long day, but I have been here and appreciated your testimony.

As we have heard throughout the day, our country leads in energy production and innovation, and we lead in these areas because of the work that is done in my district and surrounding areas in Houston, ones where we touch every single segment of the energy industry, from exploration and production, transportation, transmission, marketing, technology, both traditional and renewable.

And I am going to resist the congressional urge to spend 5 minutes talking about how great my district is, although it is, but I want to share these data points because I think it really helps underscore both the importance of the issues to me and also the depth and breadth of knowledge of my constituents that I bring to the work of this committee.

And it is with that in mind that I am glad to say I have heard a lot of things I agree with today from our witnesses, from my colleagues on both sides of the aisle, but I have also heard a few things I disagree with. And I can't go through all of them here, but I am disappointed to hear some of the attacks on the 117th Congress' energy policies rather than more ideas about how we can work together to build on the historic investments that we made in the last Congress.

And, you know, we have talked about some today especially the focus on permitting issues that affects all sectors and which I very much look forward to working on. But I do think it is important to underscore that the Infrastructure Investment and Jobs Act and the Inflation Reduction Act that we passed last Congress are historic pieces of legislation that make energy and infrastructure investments that further strengthen American energy security and drive innovation for our energy future.

At this moment we have an energy sector that is looking stronger than ever, with the EIA expecting U.S. domestic oil production to set a new record high this year of 12.4 million barrels a day, which would surpass the previous record set in 2019. The red count is back up. It was 771 last week. Net exports are also expected to rise, further strengthening our energy security and, importantly, that of our allies. And this is happening while we are working to meet growing global demand for energy and reducing admissions.

The bottom line is that we need to do all of the things we are doing and more, and we need a holistic approach. So I really look forward to talking about what that is and how we come together to do that on this committee this Congress.

But for today I want to focus my questions on one of the programs that we passed in the Bipartisan Infrastructure Law: funding for the implementation and design of regional hydrogen hubs. And through this program, Congress authorized the development of multiple hydrogen hubs to advance the country's clean hydrogen sector. And the Department of Energy will select 6 to 10 regions to establish these hydrogen hubs.

Mr. Crenshaw and I recently wrote a letter to Secretary Granholm making the case, not surprisingly, for the Department to select Houston as a location for a hydrogen hub under the program.

So I want to direct my question first to Dr. Unruh Cohen. In the interests of time, I am going to ask this, and I have a quick follow-up if we can get to it. If not, I will submit it to you for the record. But can you just talk a little bit about how this program will enhance hydrogen technology deployment and why Federal support is essential in emerging technological sectors like hydrogen?

Dr. UNRUH COHEN. Yes. And I will sing Houston's praises in the process because they are a great example of where industry, academia, the local government have come together to identify we need to take our strengths and talents in the industry and expand that.

So I think you will be a good candidate for the hydrogen hub. The program will drive these types of partnerships between industry and the Federal Government to develop the new technology. And hydrogen is critical for also all of the petrochemical work that happens in the Houston area, because we are going to need clean green hydrogen to help decarbonize some of those processes so that we can, you know, benefit and have clean chemicals coming out of our domestic plants.

Mrs. FLETCHER. Well, thank you for that.

And with the time I have left, I do want—I may have to get your question for the record, and if anyone else wants to submit a response, I would appreciate that, because I think while this investment is essential to jump starting the technology, I worry there's still a lot of hurdles that Congress needs to address before we can see widespread adoption.

DOE's 2020 Hydrogen Program Plan identified rights-of-way and permitting issues for hydrogen pipelines as challenges for hydrogen delivery infrastructure. And I think there's still a lot of unresolved questions regarding siting, political Federal/State jurisdictional conflicts, and the regulation of pipeline rates and terms of service that need to be resolved.

So with the 12 seconds I have left—oh, have I gone over?

Mr. CURTIS. You are going the wrong direction.

Mrs. FLETCHER. I am going the wrong direction. So with that, that is my question. If you could respond to that for the record, I would appreciate it.

And I will yield back the balance of my time that I have gone over. Thank you very much, Mr. Chairman, for indulging me.

Mr. CURTIS. Yes. All right. Thank you. The gentlewoman from Texas yields.

The Chair recognizes the gentleman from Georgia, Mr. Allen.

Mr. ALLEN. Thank you, Mr. Chairman.

And, you know, energy security is national security. We have heard that over and over again. And when we were in the last—the last time we were in the majority, we passed the Congressional Review Act. And what it did was, you know, it revised a lot of the regulations, updated a lot of regulations around the oil and gas industry. And what we saw we couldn't believe. We became energy dominant, and we had the power to control the cost of a barrel of oil. That to me is maybe the greatest power that you can experience. In fact, we drove it—you know, market price was $30, $40 a barrel. We created an oil war with $7 a barrel. And now we are, what, $90 to $100? It has been over $100. And, Mr. McNally, you said it was going to fluctuate even more than that.

But, in fact, we did this throughout the economy. And, Ms. Jackson, everybody benefited. It was the greatest economy I've ever seen in my lifetime. So there is no secret that President Biden and his administration have declared a war on fossil fuels. I mean, he said, "There will be no more drilling." I think that was a quote.

And so we see what has happened now. In fact, back in the greatest economy, we had 1.26 percent inflation.

And so, you know, Mr. McNally, how could we unleash the oil and gas industry and become energy dominant again? Is there a secret sauce?

Mr. MCNALLY. Did you mean me or Mr. Dabbar?

Mr. ALLEN. I mean to both, yes.

Mr. MCNALLY. OK. Well, again, if I could rephrase my attempt to answer Congressman Eshoo's very good question: Get back to all of the above and get honest data and analysis. If we can just do that, we will be in a much better place.

To his credit, President Obama—to his credit—helped get rid of the crude oil export ban, which directly threatened the shale oil boom, and recognized not only was that good for our energy production, but helped us offset the loss of Iran, which we were sanctioning and so forth. He understood that transitions are multi-decade affairs, and he, to his credit, thought that gas was part of the clean energy future.

But as you have pointed out, we have moved to keep it in the ground, to a war on fossil fuels, and that must end. And I think, honestly, if we could just get back to where we were in the last few Presidents, including President Trump, where it was all of the above, we can unleash, you know, our energy potential.

Mr. ALLEN. Mr. Dabbar?

Mr. DABBAR. So, Congressman, it started with great innovation by the Member of Texas. The Permian Basin cost year by year was dropping because of innovation. That allowed us to drive prices down globally as a result of that innovation. Then the Federal system and the State systems allowed things to get built to move that energy to where it needs to go——

Mr. ALLEN. So let me ask you this: Would it be fair to assume that free market drives prices down, government intervention drives prices up?

Mr. DABBAR. That is the irony of what we are seeing today.

Mr. ALLEN. OK. So we have got—so what we have done—I was on the House Energy Action Team, and I met with a lot of—I was a small business owner. I met with a lot of small business owners who were in the business of drilling and refining. They are out of business. They were driven out of business.

You know, if you have more demand than you have supply, guess what? The price is going to go up. Now, obviously, if you are one of the few companies remaining, you are going to benefit from that.

Now, how do we reverse that? We have got to open up the free markets, and then you will drive down prices. I mean, you know, there is no secret to the way our economy works.

As far as—also, I wanted to ask you a quick question—I have got about 45 seconds—about Russia being a leader in exporting enriched fuel. And, of course, the strategy was to urge for U.S. production of our own nuclear fuel. I have got Vogtle 3 and 4 hopefully coming on line. We have got plenty of electricity in Georgia. In fact, you are probably going to have to bring your car to Georgia to charge it at some point in time.

But can you give me a little background on that?

Mr. DABBAR. So Russia has almost half of the global enrichment market. The biggest exposed company to that is the United States. If Russia tomorrow decided to stop exporting their enriched uranium to us over the course of a couple refueling cycles, we might lose half of the fuel needed to run the nuclear power plants. That is 20 percent of the country. That is 10 percent of the power plants would be at risk of not having fuel.

Mr. ALLEN. And I would hope that this Congress will do something about that.

Thank you.

Thank you. And I yield back.

Mr. CURTIS. The gentleman yields.

The Chair recognizes the gentlewoman from California, Ms. Barragán.

Ms. BARRAGÁN. Thank you, Mr. Chair.

When I received the Republican committee memo for today's hearing, what stood out to me was the complete absence of the need for U.S. energy policy to address climate change or environmental justice. Not a word.

An effective U.S. energy policy must keep costs down, create the jobs of the future, and reduce the fossil fuel pollution that warms our planet and harms the public health of many communities, including my own Latino community and communities of color in my district.

Dr. Unruh Cohen, let me thank you. Thank you for your tireless work in the last Congress with the select committee to make sure that we were doing everything we could to save the planet, addressing climate change, and doing the hard work of the select committee.

Now, one important program from the Inflation Reduction Act the Democrats passed is $3 billion for climate and environmental justice block grants based off of my bill, the Climate Justice Grants Act.

Can you tell us a little bit about how can this program help to reduce energy costs and reduce pollution in communities of color and other communities across the country?

Dr. UNRUH COHEN. Thank you for the question, Congresswoman.

That is one of the most exciting programs in the Inflation Reduction Act. That is going to provide funding to empower communities, to look at the challenges that they are facing when it comes to energy costs, climate costs.

You know, as we have heard from Ms. Jackson and others, you know, there are challenges that constituents are facing. High prices are, you know, problems for everybody.

And so this program is going to really empower communities to figure out the solutions that work the best for them, to help bring them affordable clean energy and respond to the climate crisis consequences that they are seeing already in their communities.

Ms. BARRAGÁN. Great. Thank you.

My next question is also for you. I want to talk a little bit about geothermal, something that the chair and I are working on together, and how we invest in geothermal. The question is related to the Climate Crisis Action Plan that the Select Committee on the Climate Crisis worked on, highlighted the development of more geothermal energy as a building block of growing American clean energy production.

Could you describe how increased development of geothermal energy in California and elsewhere would enhance U.S. energy security with 24/7 clean power?

Dr. UNRUH COHEN. Yes. Geothermal is tapping into the power of the earth and what is all around us. California has been a leader because of the particular geologic benefits and profile in California. But as the technology has improved from investment in DOE over the years, we are now at a place where we are close to commercialization of energy supply in areas that don't have quite the great resources that California and other parts of the West have.

And so it will also—it will add to that need to provide dispatchable power to have—to fill in at times that we need it. And

I think it is actually one of the most exciting opportunities coming our way.

In addition, quickly, it also will use the skill set and training of many members who are working—or workers in the oil and gas industry right now. And so it provides an additional opportunity for them to take their skills and help to continue to provide this country with energy.

Ms. BARRAGÁN. OK. Thank you.

Mr. Chair, I would like to enter into the record a January 30 Climatewire article titled “China Invests $546 Billion in Clean Energy, Far Surpassing the U.S.” This is China’s 2022 investment.

Dr. Unruh Cohen, the Inflation Reduction Act passed by Democrats includes $369 billion in clean energy and climate programs. It is important to fight climate change and to compete with China for the jobs and industries of the future. More must be done to support clean energy.

What are the most important steps that the U.S. can take in the next few years to keep pace with China on clean energy?

Dr. UNRUH COHEN. I think we are seeing it already. You know, just since the passage of the Inflation Reduction Act, we have seen hundreds of announcements about bringing clean technology manufacturing to the U.S. and expanding what we have already. I had in my testimony, you know, nearly $90 billion in projects, and that is private capital coming in, you know, ready to partner and have that synergy with the Federal Government investments.

Ms. BARRAGÁN. Thank you. Thank you for your responses.

And I yield back.

Mr. CURTIS. The gentlewoman from California has asked for a document to be entered into the record. We are waiting for that document. Peter, we will reserve that until the end of the meeting.

Ms. BARRAGÁN. Thank you.

Mr. CURTIS. Yes.

The Chair recognizes the gentleman from Ohio, Mr. Balderson.

Mr. BALDERSON. Thank you, Mr. Chairman.

Thank you all for being here today. I know it has been a long day.

Mr. Dabbar, my first question is for you. It is no secret that the shale revolution in the United States has brought immense economic benefits. In Ohio, natural gas and oil development contributes more than $50 billion to the State’s GDP and supports hundreds of thousands of jobs.

In addition to the economic benefits, we have also seen clean environmental benefits from increased use of natural gas. According to the Department of Energy, use of natural gas for electric power production has led to a 57 percent reduction in domestic emissions of airborne particles such as soot. This has resulted in an estimated $17 billion in annual health benefits.

And in 2021, U.S. natural gas exports were the highest on record, and the United States has been an annual net exporter of natural gas since 2017.

Can you discuss the public health and environmental benefits America has seen as a result of the shale revolution?

Mr. DABBAR. So, as you pointed out, the big shift from coal to natural gas has had a big impact. Another thing that has been kind of underreported—and, actually, this is kind of efficiency when it comes to natural gas—the natural gas power plants that you produce in your State, the combined cycle gas plants, are about 50 percent more efficient than they were. And so they are running on natural gas, and they are 50 percent more efficient. That means it takes less BTUs, it takes less energy to make the same amount of electricity, and it produces 50 percent less emissions.

So the emissions have been driven down in large part because of your State, because of both the natural gas production, but the turbine improvements. The combination of those two has dramatically reduced emissions as a result.

Mr. BALDERSON. Thank you.

In followup to that, can you discuss the possible global environment benefits in exporting our cleaner natural gas to developing nations?

Mr. DABBAR. Yes. So the developing nations—if you go to any international conference, you go to especially the African nations, they are very upset today, OK, because they say that the IMF and the World Bank and saying, like, "You can't get any money to build energy. You guys did it, but we are not allowed."

And it is pretty stark when you go out to these international meetings and listen, in particular to the African nations. Right now they burn coal being made by Chinese companies, coal-fired power plants. They don't produce much natural gas in China. They have to import.

So our ability to export natural gas to those countries and do what we did in this country versus what the Chinese are doing to the world is quite—it is quite obvious.

Mr. BALDERSON. Thank you.

When green-at-all-costs advocates in Europe shut off nuclear and fossil fuel power generation years ago without concern for their own baseload needs, they found themselves beholden to the likes of Putin for oil and natural gas.

What has happened in Europe is certainly not a path my constituents want our country to follow.

Mr. Dabbar, you referenced the problems facing Germany earlier, and I would like to expand on that. Do you have concerns that this administration is putting the cart before the horse when it comes to the transition to renewables? That is the first question.

And instead of picking winners and losers, why is it so important this administration and Congress promote all forms of energy production?

Mr. DABBAR. If you want to see the worst-case energy policies is look at Germany. They decided to shut down nuclear when it was perfectly safe because of what happened in Japan. They decided to increase their risk with an autocrat in terms of their energy exposure, and they expanded renewables where Germany is not particularly sunny and it is hard to site because it is a relatively crowded country.

I think one of the starkest things you can see on the internet was when the former President was at the U.N. saying to the Germans that they were going to be increasing their risk of energy exposure to Russia and they better stop it. And there was a picture of the

Germans at the U.N. laughing at him. I think we know where things actually turned out.

Mr. BALDERSON. Agree.

Mr. McNally, I would also like to hear your thoughts on how we can ensure energy policies don't lead us into the same situation much of Europe has found itself in.

You have 30 seconds. Thank you.

Mr. MCNALLY. Yes. So, again, do not let China dominate the supply lines for renewable power and electric vehicles should those really take off in scale into the future. Maintain our strategic stockpiles. Remain to become an arsenal of energy, remain that. Stay open to exports. Keep diversity and global energy and be at the center of it.

Mr. BALDERSON. Thank you very much.

Mr. Chairman, I yield back.

Mr. CURTIS. Thank you. The gentleman from Ohio yields.

The Chair recognizes the very patient gentlewoman from Illinois, Mrs. Schakowsky.

Mrs. SCHAKOWSKY. Thank you, Mr. Chairman.

It is my own fault. You know, the rule is, if you miss the gavel, then you go to the end of the line. I didn't realize that. That wasn't true when we were in the pandemic.

Anyway, I am happy to be on the committee and happy to be here today, and I am really looking forward to the rollout of the Inflation Reduction Act and the Infrastructure and Jobs Act because I think it is really going to make a difference. It is going to make a difference to communities all over this country, and it is going to make an unprecedented investment into America's clean energy future, creating millions of good, clean jobs and lowering the prices of people at home on their energy, on their energy bills, and finally, really addressing the climate crisis.

And I agree with a previous Democrat here saying that I don't hear enough about that. You know, we have all—we should put in the same level all of the energy options. This is an existential issue right now dealing with the climate, and I am so happy that we are going to be addressing that as well as maintaining and I think even enhancing the economy of our country.

One of the things that was in the bills that we passed would be an investment in a historic $15 billion for the removal of lead service lines, a problem in my community and in so many communities where we are not drinking clean water because of these lead service lines, but also billions of dollars that are going to help communities that are most affected: low-income communities, communities often most populated by people of color.

But I also want to mention that over almost 100 years Americans have been subsidizing the fossil fuel industry to the tune, even today, of billions of dollars. And I think it is important just to mention that, that somehow spending the amount of money that we are on addressing the climate crisis is certainly as important.

I wanted to—meant to ask Dr. Unruh Cohen the question similar to the one that was asked earlier. We haven't rolled out the kind of programs that are going to deal with environmental justice communities, communities that are suffering right now.

What are some of the important things that we are going to be doing that will serve those communities and address the absolute relevant issues that Ms. Jackson raised?

Dr. UNRUH COHEN. Thank you for the question.

And I think, you know, we are in a really exciting time. So for, you know, the first—these were the first laws that we really have been able to put money forward in specifically environmental justice programs. The Biden administration is focusing in its investments and has committed to fulfilling the Justice40 so that we see these benefits flow to these communities that have been underinvested in, that have experienced, you know, the impact of pollution that comes from fossil fuel development and refining.

Mrs. SCHAKOWSKY. Aren't there also workforce opportunity benefits that might accrue?

Dr. UNRUH COHEN. Yes, absolutely. And I think we will see as these clean energy programs roll out, there will be a focus of developing jobs for people in the community and getting them the training. You know, we talked about earlier workforce is a place that I think we need to have more focus from the Congress and this committee. And so I hope, while we will see some improvement, that this committee can work on some of those issues going forward.

Mrs. SCHAKOWSKY. Let me ask you this. Instead, it seems to me in working to pass what I think is an effective legislation that had to do—that was passed that had to do with—am I over? I think I am.

Mr. CURTIS. Yes, a minute over.

Mrs. SCHAKOWSKY. OK. I will write that and send it to you.

Thank you.

Dr. UNRUH COHEN. I look forward to it. Thank you.

Mrs. SCHAKOWSKY. I appreciate it.

And I yield back.

Mr. CURTIS. I don't mean to be aggressive——

Mrs. SCHAKOWSKY. No, you're right.

Mr. CURTIS [continuing]. But we are going to have to get everybody in before votes.

So the gentlewoman yields.

The Chair calls on the gentleman, Mr. Fulcher, from Idaho.

Mr. FULCHER. Thank you, Mr. Chairman.

I just need to respond to a comment a few moments ago from my friend from California that indicated that the United States somehow needs to follow China's lead on clean energy investment. And I just want to state for the record that, if anyone believes that that is a model that we want to follow, pay China a visit, and I think they may change their mind.

But on to my specific topic. This is going to be a question for Mr. Dabbar. But it is in regard to geothermal energy. And in my State, Idaho, we have been a little bit of a pioneer on that front. There is—the first district heating system in the country was in Boise, Idaho, in 1892, and we have got a very good resource there. It is carbon free. It is baseload. And we are a little bit familiar with it there, but it doesn't seem to get a lot of attention.

And you made a comment, Mr. Dabbar, earlier today that caught my ear that these—you need to be technology neutral, I think was the term you used, when making decisions on these sources and not some political idea and try to drive it with subsidies.

And so, with that comment, I wanted to just get your opinion. I have got a—I have had a bill that I have run for several years called the Enhancing Geothermal Production on Federal Lands Act that basically allows geothermal exploration and production on Federal lands where there's already existing leases, oil and gas leases.

It hasn't made it very far, but I wanted to just get your opinion. Does this satisfy the tech neutral argument that you laid out before? What are the opportunities and challenges for geothermal in this country?

Mr. DABBAR. Congressman, I think expanding geothermal is absolutely something that we should be looking at. And not knowing every detail of the bill, I think facilitating lands that are already being used for energy production that have the geology already mapped out is going to drive down costs and increase the likelihood of finding the right formation. And further investment in driving down costs of geothermal equipment, right, and the thermal efficiency, it gives great baseload generation, right. It is great baseload generation wherever it is at. And I would think any place that it is available, we should be aggressively attacking that.

Mr. FULCHER. Thank you for that.

And I need to pivot and just utilize my time as best as possible. I am going to shift, and I have a question for Mr. McNally here.

It does go to the nuclear arena. And also in my State we have the Idaho National Lab, and there is a lot of research there with small modular reactors. And one of the arguments that we hear is that, in addition to the efficiency of the energy production, there could also be some upside when it comes to grid security, specifically because we are threatened with sabotage, we are threatened with cyber attacks on our energy systems so much now.

By having an energy source that you can isolate—for example, one reactor could potentially power the City of Boise, Idaho. By isolating that and staying off ultimate connectivity of an overall grid, that could help with a cybersecurity or cyber attack threats.

Your comments on that? Is that true or is it false? Is it benefited—is it a benefit to be isolated off the grid, or is it a negative to do that?

Mr. MCNALLY. Congressman Fulcher, on that question, that is outside my area of expertise. I would defer to my panel mate, Mr. Dabbar, if you might have a view on that. But that is outside my area of expertise, I am afraid.

Mr. FULCHER. OK. Mr. Dabbar?

Mr. DABBAR. Yes. So I think nuclear power is absolutely supportive of grid security. First of all, it is really hard to penetrate a nuclear reactor in terms of security, and I think that has a lot of value. And then, at the end of the day, the availability of it is unparalleled in this system.

Mr. FULCHER. But the isolation of staying off of a greater grid, do you think that is a good thing or a bad thing?

Mr. DABBAR. The ability to separate in times of any challenges in the grade, including an attack, has great value.

Mr. FULCHER. OK. Thank you, Mr. Chairman. I yield back.

Mr. CURTIS. The gentleman yields.

The Chair recognizes the gentleman from Texas, Mr. Pfluger.

Mr. PFLUGER. Thank you, Mr. Chairman.

I would like to thank the witnesses as well. Most of the good questions have been asked today. Thank you all for being here.

I represent the Permian Basin that has been mentioned several times. This is literally the heartbeat of America's energy. It is the heartbeat of the shale revolution. I am so proud of the men and women in the Permian Basin, Midland and Odessa and throughout that part of the country, that have innovated to a point where we have literally helped raise a billion people out of poverty throughout the world. We have literally lowered the cost of living for every American family to the tune of $2,500 per year. We have allowed this economy, prior to January of 2021, to soar, to absolutely take off.

And I am trying to figure out right now, the discussion about the climate crisis, what—who is saying that this is the greatest threat we face with any sort of facts?

And, Mr. McNally, to your point, I want to see the analysis here. I want to see the data. You all have made some incredible points on that.

I go back to some of the campaign promises that the President made. And I quote: "We are going to get rid of fossil fuels. There will be no more coal plants. We are going to phase out fossil fuels."

Those were three quotes that he made. I got to hand it to him, he has done everything he possibly can with every tool to assault the 2 million Texans who are in this industry who are, like Dr. Cohen's family in Corpus Christi, who are doing the things cleaner and more efficiently and better than anywhere else on the planet. He has assaulted this industry in a way that is directly attacking—and thank you, Ms. Jackson, for your testimony today—the most vulnerable in our country.

I appreciate the regulatory and the permitting discussions.

Mr. Dabbar, if we continue with the policies that this administration is pushing, what is our country going to look like? What is our economy going to look like? What is our—you know, we are expecting, what, 45 percent increase in demand over the next 30 years in electricity. What are we going to look like?

Mr. DABBAR. I think the key word you just mentioned there, Congressman, is demand. So I think, no matter how you approach this topic, as long as there is a demand for a product, then it has to be supplied from someplace.

And taking aside all the other debates, if we are still going to be needing petrochemicals to make this pen or to drive some cars because they are not all electric vehicles, someone has to provide it. I think we can all agree on that from both sides.

And so, if it is not produced in Midland or Odessa, it is going to be produced in Caracas or outside Tehran. So that is it. That is it.

So if we restrict it because of ESG, if we restrict it because of siting in this country, it will be produced overseas. It will emit more. It will be more environmentally hurtful for the world. It will be less jobs. It will be jobs in Tehran, not jobs in Odessa. I think it is relatively straightforward.

So even if you have this debate on this topic, you know, about demand, you know, as long as the demand is there, you know, for national security and the economy and the environment, it is better to be produced in America than it is in Russia or someplace else.

Mr. PFLUGER. Yes. Right now in San Angelo, Texas, my hometown, which is about 120 miles to the east of Midland/Odessa, it is 27 degrees. It is snowing. There is no wind at all, and the sun is not going to shine until Friday morning. And it will be 27 degrees on Friday morning. I just looked at the weather forecast.

I asked Mr. Kerry, the climate—I don't know what his official position is. They call him the climate czar. But I asked him if renewables provide baseload capacity. And I will ask, Dr. Cohen, the same to you. We have a ton of wind energy. In fact, we are so proud of the wind energy we have, which is more than the State of California in my district.

Do renewables, whether it is solar or wind or another form I am not familiar with, provide baseload capacity for my family right now?

Dr. UNRUH COHEN. Renewables provide predictable electricity for your family and families all across the country.

Mr. PFLUGER. And predictable is, I think, not always reliable.

Dr. UNRUH COHEN. Predictable means predictable. We know when the sun will shine. We know when the wind will blow. Smart grid operators can then provide—make the energy decisions they need to keep the lights on.

I just happened to look at the Texas electricity map yesterday, and I noticed there is a lot of stranded electricity down in my part of the world. So if Texas could continue its leadership in building transmission, they actually would be able to free up some of that renewables that's blowing between Corpus Christi and San Antonio and get it up to other parts of the State.

Mr. PFLUGER. It takes every form of energy, every amount of energy, and every bit of energy to service the demands. I could talk for another 10 minutes, but I don't have that much time.

I yield back.

Dr. UNRUH COHEN. Well, maybe we can talk again another time.

Mr. PFLUGER. But they won't let you. Thank you.

Mr. CURTIS. The gentleman from Texas yields.

The Chair calls on the gentlewoman from Tennessee, Mrs. Harshbarger.

Mrs. HARSHBARGER. Thank you, Mr. Chairman.

And thank you all for being here. You are tired. I am tired. So I am going to make a couple of comments, and then I will go to my question for Mr. Dabbar.

Ms. Jackson, I want you to know that I represent a rural district with two distressed counties. The average median income is 49,000, so I understand exactly. I get calls every day from constituents—who I call my friends and family, by the way—and they tell me, "If I pay my power bill, I am going to have to make decisions about, do I buy groceries or do I buy my medication?"

So I want you to know I totally understand; OK.

And, Mr. McNally, your statement about foreign and domestic actors beginning to attack our domestic energy infrastructure has never been more evident than with the Colonial Pipeline attack. I was on Homeland Security last Congress on the Cybersecurity and Critical Infrastructure Subcommittee, and it was very frightening to hear how that attack occurred and that it could happen again.

And it hit me because I drive from my district in East Tennessee all the way to Washington, DC, every weekend, and I had to stop at every gas station along the way to make sure that I had fuel just to come here and do my job. So that hit home.

And you saying—I agree with you that Congress needs to be better prepared for more cybersecurity attacks, and we need to hold those bad actors accountable. That is a big deal.

And, Mr. Dabbar, your comments about Russia having the largest overall HEU stockpile in the world and your statement that the U.S. needs to work on our uranium enrichment capabilities is on point.

And just so you know, I have nuclear fuel services in my district, and I have talked to many of those people there, and they absolutely understand the importance of this very issue, why we need to do enriched uranium.

So with that said—and I will continue to talk to them, so stay tuned—I agree that we absolutely need a higher baseload of power because we have seen how fragile we are to these disruptions.

And my question is this. I am from East Tennessee, the 1st District, and just before Christmas, East Tennesseeans experienced rolling blackouts after the Tennessee Valley Authority was unable to meet those energy demands required to heat your homes during Storm Elliott. We know that natural gas facilities can come fully on line around 30 minutes and our best option for wrapping up energy production in a pinch.

My question is this: How much additional investment in natural gas will we need to combat these unexpected increases in energy demands in the future?

Mr. DABBAR. So, Congresswoman, you know, TVA shut down baseload just like other places have.

Mrs. HARSHBARGER. Yes, they did.

Mr. DABBAR. And that is the reason why I think you ran into those problems, was that TVA was shutting down more plants. They are coal plants. You can kind of understand it, but you are going to need to replace them with something. You need to replace them with something that can be dispatched.

Mrs. HARSHBARGER. Yes.

Mr. DABBAR. And natural gas is the obvious place to go, subject to some of your nuclear power plants, which would be wonderful for East Tennessee.

Mrs. HARSHBARGER. Yes.

Mr. DABBAR. So the gas pipelines in general are not there to replace plants that used to be coal and rail and so on. So things are getting more unreliable in the whole TVA area, including in your region. That is the reality.

And if gas pipelines are not built, you are going to run into that problem more and more. As your great economy grows—I know East Tennessee well from being at DOE——

Mrs. HARSHBARGER. Oh, yes.

Mr. DABBAR [continuing]. You are going to have additional problems because your economic growth is so strong.

Mrs. HARSHBARGER. You know, the scary thing was that they didn't give notice—TVA didn't—to emergency management services. The emergency broadcast systems went down because of the rolling blackouts. There was equipment damage. We are trying to track that too as we go along, to see how long they were down, how much notice did they get, how much damage was done monetarily, because there was one industry that lost $3.5 million just from the shutdown and had to work through the weekend.

And I have a question, and anybody can answer this in the amount of time I have left. You know, the American people tell us, "Come up here and work, do your job, and get results." But, like so many other projects, whether it be energy production or highway improvements, they get stalled in the NEPA process, and I guess my question is, What would a rerun of NEPA look like, and how that would allow for us to build natural gas production so that environmentalists can't stall those projects into nonexistence? Anybody?

Mr. MCNALLY. How about a bipartisan agreement to have legally enforceable deadlines for NEPA decisions? Clean energy, conventional energy, everything, just say you got a certain amount of time, you got to get it done here, and you cut back on the litigation risk that we have heard today, and it is for all energies, all businesses and so forth. I sense maybe there is bipartisan agreement behind that.

And then we might want to think about critical national security infrastructure, where there you supersize it, you say, "NEPA," you know, "you got to go even faster." But I would hope there is—I am sensing bipartisan agreement, we got to improve permitting for all energy here.

Mrs. HARSHBARGER. Fantastic.

Dr. UNRUH COHEN. Chairman, I would just underscore that the Inflation Reduction Act had nearly $1 billion for agencies to fund their permitting work.

Mr. CURTIS [presiding]. Thank you. The gentlewoman yields.

Take us home, the gentlewoman from Iowa, Dr. Meeks.

Mrs. MILLER-MEEKS. Thank you very much, Chair Curtis, and thank you to all of our witnesses. Iowa is an energy State, so that may surprise people. Usually I don't need this, but Iowa is an energy State, and let me also say, unequivocally, that all of us, I think, bipartisan agree that we want a cleaner, healthier planet for our children and our grandchildren.

But we also want to be able to have an economy that can compete in a global economic environment. Energy demand that I learned at COP26 and COP27, to my surprise—I thought energy demand was increasing—I was surprised to hear at COP26 and 27 that they thought energy demand is increasing. What I have yet seen from this administration is a way to transition with reducing emissions.

So let me tell you a little bit about Iowa. Iowa has 50 percent of its energy from renewables, so that is wind, solar, biodiesel, ethanol, biomass, bio char, manure. We have this entire slew, and up until 2 years ago, we also had nuclear. We have an entire slew. Fifty-eight percent of our electricity is generated by wind.

And we were told this year that we would potentially have rolling blackouts. Why? Because we are an energy exporter. So why should a State that generates massive amounts of renewable energy be subject to rolling blackouts? And it is because there is not enough energy production.

On average, it takes 6.5 years to prevent transmission projects in this country. There are some examples of projects taking over 10 years, and they are still not fully transmitted—or permitted.

If we are serious about improving our grid security, modernizing our grid infrastructure, and diversifying our energy mix, we need permitting reform.

Last Congress, I introduced the Stay Off My Line Act, which seeks to address some of these permitting challenges. And just very briefly, if you can, because I have got a couple of questions, what other steps can we take to improve our Nation's permitting process when it comes to transmission?

So if you would, Mr. Dabbar, if you could take a swipe at that.

Mr. DABBAR. Yes, Congresswoman. I keep coming back to the time clock. People don't want to have things built and use the time clock——

Mr. CURTIS. Excuse me. Your microphone, please.

Mr. DABBAR. The time clock of approvals under NEPA is basically preventing things from getting built. I think that is the biggest thing that could get fixed.

Mrs. MILLER-MEEKS. Thank you very much.

Dr. UNRUH COHEN. I would add that, in Senator Manchin's permitting legislation, the language that dealt with transmission, I think, is a good place for this committee to look about going forward.

Mrs. MILLER-MEEKS. Thank you, Ms. Unruh Cohen, and you had mentioned that earlier as well.

Iowa is also the Nation's largest fuel ethanol producer, and it accounts for about one-fourth of U.S. fuel ethanol production capacity. I have heard a lot from this administration and from people about electrifying our transportation sector.

So I want to bring up a little different source of energy than what we have talked about throughout this 4 hours. I am very supportive of ethanol-based aviation fuels or sustainable aviation fuels. According to the Department of Energy, replacing existing jet fuels with sustainable aviation fuels has been recognized as an effective strategy to help the aviation industry reduce greenhouse gas emissions, diversify fuel supply, and enhance energy security.

The technology needed for SAF production already exists, including ethanol-to-jet-conversion technologies. Compared to petroleum jet fuels, sustainable aviation fuel produced from today's corn ethanol offers a 15 percent lower carbon intensity and, as we have heard, can even be carbon negative.

This is, in part, because the technology to produce ethanol from corn is improved. In fact, lifecycle emissions of corn ethanol have decreased by roughly a quarter in the past 15 years.

What sort of R&D incentives and coordinated efforts would be needed to speed up the deployment of SAF in commercial aviation? Mr. McNally?

Mr. MCNALLY. I hate to—I learned a long time ago working for President Bush, you either know the answer to the question or you say, "I don't know and I can find out." So I am going to pass to any other of my colleagues who might have views on SAF. It is not something in research and development.

Mr. DABBAR. We funded quite a bit of this at DOE, and as you mentioned, it is a big area of focus. The conversion of wind energy into sustainable aviation fuel, through a series of chemistry steps, is completely doable. You can turn wind into aviation fuel. And so—it takes a few steps of energy, and some efficiency needs to be improved. But Iowa is in an excellent position to help drive that innovation.

Mrs. MILLER-MEEKS. Thank you very much. And I would agree with our, you know, Ames Laboratory, with what we are doing in the renewable space, and then also continued innovation in nuclear fusion, as we have just seen some landmark things occur, and then in hydrogen as well. I think we have a bright future if we focus on where we have agreement and that we all want a cleaner, healthier planet. Thank you.

Mr. CURTIS. The gentlewoman yields, and the Chair calls on the gentlewoman from Florida.

Mrs. CAMMACK. Thank you, Mr. Chairman. Thank you to our witnesses for being troupers. We are in hour 6 of this committee. So thank you for your diligence, persistence, and endurance.

But speaking of endurance, our economy needs some endurance, and that can only be provided through a reliable, domestic production of energy. So I am so excited this is our first hearing, our first topic.

It goes without saying, I think, regardless if you are Republican or Democrat, we are an energy economy. Everything begins and ends with energy. So I am excited for all the discussion that we have had today.

I am the author of the REINS Act, which seeks to rein in the regulatory environment, which costs our economy $2 trillion a year. You can look no further than the work that is being done at DOE or at FERC, or others, where this has been an ever-growing presence.

So I am going to go down the line. If you guys can keep them short because I do have a follow-up question. To all our witnesses, but I will start with you, Mr. McNally: Give me one regulation that we can take off the books that would help unleash domestic production of energy and bring down cost of energy in America. Just one.

Mr. MCNALLY. Take off a reform, it would be NEPA. NEPA is the taproot of all the problems. Fix NEPA and you fix a whole lot of things.

Mrs. CAMMACK. Dr. Cohen?

Dr. UNRUH COHEN. I think we have talked about unleashing some of the clean renewable energy that is tied up, and we need more transmission for that.

Mrs. CAMMACK. What regulation specifically?

Dr. UNRUH COHEN. That—I think FERC is doing some rulemaking right now that will look at their regional planning, and I think that improvement will bring a lot of new transmission building——

Mrs. CAMMACK. OK.

Dr. UNRUH COHEN [continuing]. To our country.

Mrs. CAMMACK. Thank you.

Ms. Jackson? Which, by the way, you have had remarkable quotes today. I have actually written a number of them down, so thank you for your testimony today.

Ms. JACKSON. Well, I am going to say, and I don't know if I have the regulation correct, but I would say, make the permitting reform so that we can have more energy production. It doesn't matter how many leases you have if you can't get the permits. It is useless.

Mrs. CAMMACK. Certainty. Certainty in government, it is a novel concept, I know.

Ms. JACKSON. Yes.

Mr. DABBAR. I will also go with NEPA. I think we need to clear out the litigation that has backed the standards that have been built up, and only you could clear out all that.

Mrs. CAMMACK. Perfect. Thank you. And it goes right back to you, Mr. Dabbar. We need to put energy security back at the center of our energy policy, both for our international security but also for our allies.

My question to you is an element of IP theft and China. You were at the Department of Energy during the Thousand Talents Program crackdown concerning Chinese researchers gaining access to intellectual property and other sensitive security information. And now you are also involved in a cutting-edge quantum technology exploration.

What specifically can we do, should we do, to protect our secrets and other sensitive information from the Chinese Communist Party, and how will this effort benefit our own technological development?

Mr. DABBAR. Well, with the spin out of Cal Tech, that a certain Member here, I think, also may have went to earlier, the reality is that the Chinese have a vast amount of effort for stealing technologies from National Labs at ICOT.

When I showed up at DOE, there was a significant amount of technology that was being appropriated legally because we had no regulation on the interaction, but also at universities.

And so when I was at DOE, we rolled out four orders to limit that, and I will give you one example of something that I think should be applied to other areas in addition to DOE, is that we banned grant money, the American taxpayer money, going to university researchers who were also, at the same time, talent program members for the Chinese Communist Party. We said the American taxpayer money should not go to those people who are also working for them.

Mrs. CAMMACK. Seems a little too commonsense, if you ask me.

Mr. DABBAR. Yes.

Mrs. CAMMACK. And I am sorry I cut you off, but to that point, I mean, you have the Thousand Talents Program, you have the Confucius Institutes on college campuses. I mean, is there something specifically a database that we are tracking, or is it simply just not on the books, or has it been done by Executive order on the connection between Thousand Talents and issues of national security programs that we are working on?

Mr. DABBAR. Yes, it has basically been a few agencies that have done it, and that is it. I would recommend that this Congress take a look at the best practices for what has been done at DOE and some others, at DoD, because at NSF, at NIST, the Federal Reserve has Chinese——

Mrs. CAMMACK. Wow. I appreciate your feedback——

Mr. CURTIS. The Chair greatly wants to excuse our witnesses. If you can endure it, we have got one more, and the Chair recognizes the gentleman from California.

Mr. OBERNOLTE. Thank you very much, Mr. Chairman. I want to thank all of our witnesses. You have done an amazing job. I know it has been a very long day. For you, it is almost over. I want to thank you for hanging in there with us.

Mr. Dabbar, you said something in your testimony that really resonated with me when you highlighted the fact that we are removing baseload generation from our grid at a much faster rate than we are adding intermittent power sources.

And as I am sure you know, that is a particularly acute problem in my home State of California. Because of that, we are having a situation where there are times when the sun is shining and the wind is blowing where we are having to pay adjacent States to take our excess energy because we have so much of it.

And then we have other times when we have brownouts, or we have to ask people to curtail demand because we don't have enough baseload. So the question for you is, What should be done about that? You know, what do you think we ought to be doing differently to solve that problem?

Mr. DABBAR. So, the only entity that is trying to pay attention to this, and I think they are doing a poor job, is the Cal ISO, and that is because FERC has allowed them to do what they are doing on what you just described.

I think that FERC should be under the—that you all should look at a reform of the Federal Power Act to guide FERC to actually do their job to order the California ISO to effectively set up efforts that would reinvigorate building of baseload.

Mr. OBERNOLTE. Right. I agree with you on the Federal side. On the State side, I actually put the blame more with the California State legislature, where I served for 6 years. I think the folks at Cal ISO do their best but sometimes are constrained by the State law that is imposed on them.

And that is one of the reasons why my constituents pay twice as much for residential electricity as neighboring States, three times as much for commercial electricity, four times as much for industrial. You know, it really puts a hard, heavy burden on the people in California.

Mr. DABBAR. Commissioner Bernie McNamee, former FERC Commissioner, has written a couple papers about how these layers of State, RPS standards, and tax incentives have turned what was an efficient market model that was anticipated under the Federal Power Act into very convoluted systems which does exactly as you described, sir.

Mr. OBERNOLTE. Right. So, you know, talking about baseload, I wonder if we could have a discussion about what a potential path forward would be. So, obviously, we are trying to rekindle some interest in fusion energy—I am sorry—fission energy, but there have been very promising developments in fusion energy. And I know we had a question on this from my cochair on the Fusion Caucus, Mrs. Trahan.

Could you talk about the future you see for fusion and maybe your level of optimism that that could be part of the solution to the problem?

Mr. DABBAR. So for a couple of decades, there was not much innovation in the material science and other areas around fusion. There was a lot of innovation in batteries and wind and solar.

But as of about 5 or 6 years ago, there were some big jumps in terms of innovation in fusion, in particular around material science that allowed for the magnetic fields to get stronger, that really makes the possibility of an add-out fusion possible.

The NIFT announcement at Livermore was great, but that was not made to be a power plant. That was dealing with the weapons program. So it wasn't made to be a power plant. But I think that there are a number of fusion companies, including in Southern California, including in Northern California, as well as Massachusetts, that are much farther down the road than even NIFT at Lawrence Livermore.

I would recommend that, given all—fusion has all the positives of all the other energy sources and literally almost none of the negatives. And so, given the advances in technology, I would recommend further, additional investment by the country into this now kind of beginning-to-break-through area.

Mr. OBERNOLTE. Right. Yes, I agree with you. I think it has the potential to really revolutionize this space and solve a lot of these big, hairy, societal problems that we have been grappling with. But I see I am out of time. I would ask you another follow-up question about this, but let it suffice to just say that I think it is going to require more than just investment. We are going to have to take a look at some of the regulatory framework that we have created that is appropriate for fission but might not be appropriate for fusion. I think we are going to have to amend the Atomic Energy Act to try and create a framework that works and that really catalyzes the growth of that industry.

But I want to thank you for your testimony. Thank you to all of our witnesses. I really enjoyed the hearing today. I yield back.

Mr. CURTIS. The gentleman yields back. The witnesses have made it, and I want you to know you were worth everything that you were paid to be here today. And I am going to talk to the committee about building in bathroom breaks in the future. Thank you so much to our witnesses and to all of our Members.

Without objection, I would like to request the following documents be entered into the record for today's hearings: a letter concerning the lack of natural gas infrastructure from Industrial Energy Consumers of America; a letter concerning energy regulations and productions from the American Exploration and Production Council; a statement concerning regulations and baseload generation retirements from America's Power; a paper entitled, "Creating an Arsenal of Energy" from Forum for American Leadership; a paper entitled "Blueprint for Serious and Sound Climate Policy" from the Forum for American Leadership; a paper entitled "Eight

Necessary Steps to Defend U.S. Critical Energy Infrastructure from Cyber Attacks" from the Forum for American Leadership; a paper entitled "Congress is Key to Restoring Realism in U.S. Energy Policy" from the Forum for American Leadership; a paper entitled "Setting U.S. Climate Policy Straight: Recommendations for the 118th Congress" from the Forum of American Leadership; a paper entitled "Restoring U.S. Energy Security: Recommendations for the 118th Congress" from the Forum for American Leadership—by the way, the witnesses can leave—a report entitled "Restoring America's Competitive Nuclear Energy Advantage" from the Department of Energy; a report entitled "Reducing Russian Involvement in Western Nuclear Power Markets" from Columbia University Center on Global Energy Policy; an article entitled "Russia's State Nuclear Company Aids War Effort, Leading to Calls for Sanctions" from The Washington Post; an article entitled "Ukraine War to Accelerate Shift Away from Fossil Fuels" from E&E News; a report entitled "Energy, Justice, and Climate, Change: Key Concepts for Public Health" from the American Public Health Association; and a report entitled "Improving Equity Outcomes for New Federal Investments in Clean Energy Infrastructure" from the Bipartisan Policy Committee; and finally, an article from Climatewire on China clean energy investment.

[The information appears at the conclusion of the hearing.[1]]

Mr. CURTIS. I remind Members that they have 10 business days to submit questions for the record, and I ask the witnesses to respond to questions promptly. Members should submit their questions by the close of business date, February 14th.

Without objection, the subcommittee is adjourned.

[Whereupon, at 4:48 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

[1] The Department of Energy report has been retained in committee files and is available at https://docs.house.gov/meetings/IF/IF00/20230131/115356/HHRG-118-IF00-20230131-SD014.pdf.

Industrial Energy Consumers of America (IECA)
The Voice of the Industrial Energy Consumers

1776 K Street, NW, Suite 720 • Washington, D.C. 20006
Telephone (202) 223-1420 • www.ieca-us.org

January 30, 2023

The Honorable Cathy McMorris Rodgers	The Honorable Frank Pallone, Jr.
Chair	Ranking Member
House Committee on Energy and Commerce	House Committee on Energy and Commerce
2125 Rayburn House Office Building	2125 Rayburn House Office Building
Washington, DC 20515	Washington, DC 20515

Re: Comments for the Record on the "American Energy Expansion: Strengthening Economic, Environmental, and National Security" Hearing

Dear Chair McMorris Rodgers and Ranking Member Pallone:

Thank you for the opportunity to provide comments for the record on the "American Energy Expansion: Strengthening Economic, Environmental, and National Security" hearing.

The Industrial Energy Consumers of America is a nonpartisan association of leading manufacturing companies with $1.1 trillion in annual sales, over 12,000 facilities nationwide, and with more than 1.8 million employees worldwide. IECA membership represents a diverse set of industries including: chemicals, plastics, steel, iron ore, aluminum, paper, food processing, fertilizer, insulation, glass, industrial gases, pharmaceutical, building products, automotive, independent oil refining, and cement.

I. **Use the Defense Production Act (DPA) to build needed natural gas pipeline capacity for the manufacturing sector from Alabama to New York to boost American manufacturing investments, job creation and bolster national security.**

Today, there is either none or very limited firm pipeline capacity available on the east coast and the firm capacity that is available is being taken by entities that can pass those scarcity prices to customers. This has put existing manufacturing operations at risk and threatens to halt investments in expansions or new facilities. The entire eastern seaboard is supplied by one major pipeline, the Transcontinental Gas Pipeline (Transco). Transco has plans to expand pipeline capacity, but the expansions are insufficient and will start operating in 2025 at the earliest. Also, it is our understanding that these pipeline expansions will not benefit Transco Zone 5 Virginia and North Carolina consumers. Without natural gas pipeline capacity, the U.S. has neither natural gas or electric reliability, which threatens national security, supply chains, investments, and job creation.

There is no good alternative fuel to replace natural gas in manufacturing processes. With capital investments, other fuels such as coal, fuel oil, or propane can replace natural gas, but are undesirable alternatives. Equipment using natural gas cannot be switched to electricity. Plus, a BTU of natural gas energy is much less expensive than a BTU of energy from electricity.

There are major economic and job implications. The manufacturing sector is a significant contributor to the Eastern seaboard (see figure 1). In 2021, combined manufacturing sector contributions include 3,407,700 jobs, 30,461 facilities, and $638 billion in GDP, which is roughly 10 percent of combined total state GDP. Combined state natural gas consumption is as follows: manufacturing 1,340,881 million cubic feet (MMcf), electric power 4,700,586 MMcf, and residential 1,381,179 MMcf.

Because there is no new pipeline capacity available in the near term, the only solution is to use the Defense Production Act (DPA) to intervene at the state level to require electric utilities to temporarily delay the shutdown of coal-fired power generation and the building of new natural gas fired generation. And or, require companies that are holding firm pipeline transportation to release unused capacity for market use. Companies who hold this capacity are natural gas marketers, utilities, and LNG exporters. Finally, we urge use of the DPA to build more natural gas pipeline capacity.

There are 59 coal-fired generating units along the Transco pipeline that electric utilities plan to voluntarily shutdown and replace with natural gas-fired power. Replacing these facilities with natural gas generation would significantly increase demand by 10 billion cubic feet a day (Bcf/day) and directly impact manufacturing facilities by further reducing potential available pipeline capacity.[1]

On the East Coast, every year, manufacturing companies face growing natural gas scarcity due to the lack of interstate natural gas pipeline capacity. Inadequate pipeline capacity is negatively impacting our ability to operate existing facilities. During winter and summer peak natural gas demand, manufacturers are the first to be curtailed. When this happens, manufacturers must reduce, or stop operating their facilities with a significant economic impact that could cost millions of dollars per day. Last winter, for areas like Transco Zone 5, manufacturers paid over $20 per MMBtu for their natural gas. Until additional pipeline capacity or compression is added, our only hope to avoid more serious shortfalls of supply is to temporarily delay the shutdown of coal-fired generation.

Pipelines that would have provided needed supply like the Atlantic Coast Pipeline have been stopped by activists. Mountain Valley Pipeline (MVP) may provide limited relief to the area (its primary role is to supply LNG to the Gulf Coast). However, as you know, MVP has been stopped by activists.

Manufacturers will not expand in the region without a reliable supply of energy. Manufacturers will build new facilities in other states with robust supply.

In March 2022, the Energy Information Administration (EIA) released its report, “Exploration of the No Interstate Natural Gas Pipeline Builds Case,” a study that explores the implications of not

[1] S&P Global, March 3, 2022

building interstate pipelines that adds insight into the seriousness of the problem.[2] The following is included in the study:

> We find that not building interstate natural gas pipelines affects some regions significantly more than others. We found that East North Central, Middle Atlantic[3] and South Atlantic[4] regions were the most sensitive to changes in pipeline capacity because of limitations to growth in production in the Appalachia Basin (see page 2).

These states and their supply chain will miss out on reshoring of manufacturing jobs. Because natural gas prices are lower in the U.S., European companies are investing in the U.S., but not in states without robust reliable supplies of natural gas. The Wall Street Journal stated that European foreign direct investment in the U.S. increased to about $3.2 trillion last year from a year earlier.[5]

FIGURE 1 - STATISTICS BY STATE

States, 2021	Natural Gas Consumption (Million cubic feet)			# Industrial Consumers	# Manufacturing Employees (Thousands)	State GDP ($Millions)	State Manufacturing GDP ($Millions)
	Industrial	*Electric Power*	*Residential*				
Alabama	232,804	383,354	32,188	3,522	265.8	209,979.3	39,631.7
Georgia	162,005	418,660	126,670	2,772	405.2	575,292.2	64,944.7
Maryland	18,720	99,760	76,874	1,138	110.0	368,571.1	26,409.6
New Jersey	60,186	222,585	232,225	6,696	243.1	566,893.2	60,496.2
New York	89,731	448,621	445,564	6,044	415.6	1,514,779.2	75,235.9
North Carolina	122,230	355,937	72,067	2,672	465.9	541,933.8	102,344.7
Pennsylvania	240,907	859,281	226,453	4,482	545.4	710,973.1	101,947.2
South Carolina	99,792	178,223	33,205	1,429	254.0	221,045.0	39,264.7
Virginia	112,372	384,734	81,261	989	235.0	505,351.0	49,498.6
Delaware	32,826	21,920	11,524	130	25.1	64,404.7	5,600.1
Florida	131,299	1,307,497	19,330	496	396.6	1,029,575.6	64,480.3
West Virginia	38,009	20,014	23,818	91	46.0	71,343.2	8,488.8
Total	**1,340,881**	**4,700,586**	**1,381,179**	**30,461**	**3,408**	**6,380,141**	**638,343**

Sources: Natural Gas Annual, U.S. Energy Information Administration (EIA), https://www.eia.gov/naturalgas/annual/; State Employment, U.S. Bureau of Labor Statistics, www.bls.gov; and GPD by State, U.S. Bureau of Economic Analysis, www.bea.gov

---

[2] "Exploration of the No Interstate Natural Gas Pipeline Builds Case," https://www.eia.gov/outlooks/aeo/IIF_pipeline/pdf/AEO2022_IIF_pipelines.pdf

[3] Pennsylvania, New Jersey, New York

[4] Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia

[5] "U.S.-Europe Trade Booms as Old Allies Draw Closer," November 21, 2022, https://www.wsj.com/articles/u-s-europe-trade-booms-as-old-allies-draw-closer-11668914679?mod=Searchresults_pos1&page=1

Finally, we note that the U.S. imports approximately $1 trillion of manufactured goods per year. These are products that could be manufactured in the U.S., which would substantially increase jobs, GDP, and reduce global GHG emissions. U.S. manufacturing GHG emissions per unit of production are only about one-third that of countries like China. But we cannot do that without increased pipeline capacity.

Thank you for the opportunity to provide input. We look forward to working with you.

Sincerely,

Paul N. Cicio
Paul N. Cicio
President & CEO

cc: House Committee on Energy and Commerce

The Industrial Energy Consumers of America is a nonpartisan association of leading manufacturing companies with $1.1 trillion in annual sales, over 12,000 facilities nationwide, and with more than 1.8 million employees worldwide. It is an organization created to promote the interests of manufacturing companies through advocacy and collaboration for which the availability, use and cost of energy, power or feedstock play a significant role in their ability to compete in domestic and world markets. IECA membership represents a diverse set of industries including: chemicals, plastics, steel, iron ore, aluminum, paper, food processing, fertilizer, insulation, glass, industrial gases, pharmaceutical, building products, automotive, brewing, independent oil refining, and cement.

AMERICAN EXPLORATION & PRODUCTION COUNCIL

January 31, 2023

The Honorable Cathy McMorris Rogers
Chair
Committee on Energy and Commerce
US House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Frank Pallone
Ranking Member
Committee on Energy and Commerce
US House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

RE: American Energy Expansion: Strengthening Economic, Environmental, and National Security

Dear Chair McMorris Rogers and Ranking Member Pallone:

The American Exploration and Production Council (AXPC) thanks you for holding today's important hearing "American Energy Expansion: Strengthening Economic, Environmental, and National Security."

The production of domestic oil and natural gas provides our nation with good-paying jobs, lower-cost energy, greater energy security, and a cleaner environment. America has achieved the greatest emissions reductions in the world because of our Shale Revolution, as natural gas displaced higher-emitting energy sources – without taxpayer funding and while simultaneously providing historically low energy costs to American families and businesses.

As you know, the world continues to face a global energy crisis and the need for lower-cost, responsibly sourced, reliable energy have never been more evident. The American independent oil and gas industry has a role in meeting this challenge both domestically and internationally. In addition to being the world's largest producer of both oil and natural gas, the United States has become a top exporter of crude and the top exporter of liquefied natural gas. American energy alleviates energy poverty around the world, helping other nations achieve greater economic opportunity and prosperity.

AXPC looks forward to working with this committee on the following policies that we believe can unleash American energy production and ensure the United States remains the world leader in energy production, energy exports, and climate leadership:

- **Strengthen our nation's energy infrastructure:** To ensure we can meet growing energy demands while continuing to reduce emissions, Congress should promote infrastructure development and reform the permitting process. Streamlining the National Environmental Policy Act (NEPA) process and ending obstruction of oil and natural gas projects in the permitting process will spur project investment in energy infrastructure. The Biden Administration's interim NEPA guidance on greenhouse gas (GHG) and climate change, however, threatens the permitting of necessary energy infrastructure, including emissions reduction technologies that are critical to a lower-emissions future such as Carbon Capture, Utilization, and Storage (CCUS) and hydrogen. This guidance creates even greater delays, uncertainty, and legal vulnerability – which could make energy more expensive and less reliable for the American people. It should be repealed. Additionally, as Congress considers permitting reform proposals, AXPC has outlined specific upstream permitting reform recommendations.

- **Allow access to produce on federal lands:** Amidst the global backdrop of high energy prices and skyrocketing inflation, Congress should ensure that the Biden Administration is supporting access to produce oil and natural gas on federal lands. The US Department of the Interior should hold regular lease sales, as statutorily required by the Mineral Leasing Act. Additionally, permits and Application for Permit to Drill (APD) should be approved in a timely manner. The Biden Administration's historically low federal acreage reduction in leasing,[i] and myriad new regulations, coupled with the omnipresent risk of litigation, create serious challenges for operators working to responsibly develop federal mineral resources.

- **Protect and promote energy exports:** The energy landscape is global and US energy exports are important to our country's role in the market, global security, and our climate leadership in the world. Congress should ensure that American energy producers can continue to export crude oil, refined products, and natural gas to the global markets – which helps keep Americans' energy prices lower and more stable and maintains geopolitical stability. In addition to supporting the necessary infrastructure here at home, policymakers should promote utilization of US LNG around the world as a cleaner, more responsible choice to alternative energy sources, and support policies that will encourage building additional import capacity around the globe. AXPC's LNG Export Agenda outlines policies that will support and encourage US LNG exports.

- **Increase regulatory certainty:** AXPC member companies often exceed federal regulatory standards as part of their efforts to operate safely and efficiently and decrease emissions from upstream operations. Regulatory certainty is important to our ability to grow production and to invest and deploy new technologies that further reduce emissions from our operations. We encourage Congress to engage federal agencies, including US Environmental Protection Agency, the US Department of the Interior, the US Department of Energy, and the Council on Environmental Quality, to ensure federal regulations are technology-neutral, flexible, cost-effective, and not duplicative of other federal and state regulations.

- **Encourage capital investments in American energy production:** Our industry is committed to transparency, collaboration, and engagement on climate solutions, but that does not mean that securities laws are the appropriate context for all climate-related disclosures. Congress should urge the Securities and Exchange Commission to reconsider its burdensome climate disclosure proposal, collaborate with our industry, and allow for voluntary efforts already underway to further consistency and comparability of climate-related reporting.

- **Relieve inflationary pressure and supply chain bottlenecks:** The complex and costly process for drilling and completing a new well in the United States takes time and significant resources, even without the challenges we face currently from supply chain disruptions and labor shortages. Inflationary costs, labor shortages, and supply chain disruptions are further hindering increased production. Inflationary pressures caused a 30 percent increase in drilling and completing a well from 2021-2022, and the price is expected to be an additional 12 percent higher in 2023. The average shale well cost just $7.3mn to drill in 2019, but will cost $9mn this year, according to independent research and business analyst Rystad.[ii]

America's oil and natural gas producers look forward to working with you and your colleagues to further policies and innovative, free-market solutions to reduce Americans' energy prices, support our economy, further our energy security, and reduce global emissions.

Sincerely,

Anne Bradbury
CEO
American Exploration and Production Council

---

[i] "Federal Oil Leases Slow to a Trickle under Biden," by: Timothy Puko & Anthony DeBarros, The Wall Street Journal (September 2022). https://www.wsj.com/articles/federal-oil-leases-slow-to-a-trickle-under-biden-11662230816

[ii] "What the end of the US Shale Revolution would mean for the world," by: Derek Brower, Financial Times (January 2023). https://www.ft.com/content/60747b3b-e6ea-47c0-938d-af515816d0f1

AMERICA'S POWER
Reliable • Secure • Resilient • Affordable

January 30, 2023

The Honorable Cathy McMorris Rogers, Chair
The Honorable Frank Pallone, Ranking Member
Committee on Energy & Commerce
U.S. House of Representatives
Washington DC 20515

The Honorable Jeff Duncan, Chairman
The Honorable Paul Tonko, Ranking Member
Subcommittee on Energy, Climate, and Grid Security
U.S. House of Representatives
Washington DC 20515

The Honorable Bill Johnson, Chairman
The Honorable Diana DeGette, Ranking Member
Subcommittee on Environment, Manufacturing, and Critical Minerals
U.S. House of Representatives
Washington DC 20515

Dear Chair Rogers, Chairman Johnson, Chairman Duncan, Ranking Member Pallone, Ranking Member DeGette, and Ranking Member Tonko:

We commend the committee for holding the hearing tomorrow titled "American Energy Expansion: Strengthening Economic, Environmental, and National Security." To assist the committee, I am attaching a statement for the hearing record. My brief statement focuses primarily on coal retirements, EPA regulations, and the risk both pose for electric reliability. The statement also includes recommendations. We would be pleased to provide any additional information that could be helpful to the committee or its subcommittees.

Sincerely,

Michelle A. Bloodworth

Michelle Bloodworth
President & CEO

Attachment: "Statement of Michelle Bloodworth"

AMERICA'S POWER
Reliable • Secure • Resilient • Affordable

Energy and Commerce Committee Hearing:
"American Energy Expansion: Strengthening Economic, Environmental, and National Security"

Statement of Michelle Bloodworth
President and CEO, America's Power

January 31, 2023

Chair McMorris Rogers, Ranking Member Pallone, and members of the committee, my name is Michelle Bloodworth. I am president and CEO of America's Power which advocates on behalf of coal-fired electricity and its supply chain. We want to commend the committee for holding this hearing today on such a critically important topic and express our appreciation for the opportunity to submit this brief statement. My statement focuses primarily on the value of the coal fleet and the massive retirements of coal power plants which have become a major risk to the reliability of the electricity grid.

All of the Above

The war in Ukraine has taught us many lessons, especially the need for countries to be energy secure and the danger to national and economic security when countries fail to rely on a healthy mix of energy resources. The U.S. needs to keep these lessons in mind and develop a resilient all-of-the-above energy strategy that promotes economic growth and energy security. Unfortunately, our energy strategy is being biased by ideological preferences and unrealistic goals rather than by rational considerations. The U.S. needs to take advantage of fossil fuels, nuclear power, hydro, wind, solar, geothermal, battery storage, demand response, and likely others in the future. The combination of all (not just a few) of these resources can provide reliable, resilient, and affordable electricity.

The coal fleet is an essential part of an all-of-the-above strategy for the following reasons:

- **Dependability**
  Coal plants have a high accredited capacity value (90%) that helps prevent electricity shortfalls. Accredited capacity is a measure of how dependable a resource is when electricity demand peaks, such as during extreme weather. Based on capacity values, coal is six times more dependable than wind (16.7%) and at least twice as dependable as solar (50% but will decline to 20% in the future).[i] Battery storage will eventually improve the capacity values of wind and solar, and technology innovation is one of the reasons the grid transition needs to be gradual.
- **Fuel security**
  The coal fleet has maintained an average on-site coal stockpile equivalent to 76 days of coal burn during the past five years. Therefore, the coal fleet does not

have to rely on weather conditions (wind and sun) or just-in-time fuel delivery (natural gas) to produce electricity. Based on preliminary data, coal was able to provide almost half (47%) of the additional electricity during the height of Storm Elliott in the PJM region, 35% in MISO, and almost 40% in SPP.[ii] The coal fleet's on-site fuel gave coal plants immediate access to fuel when needed.

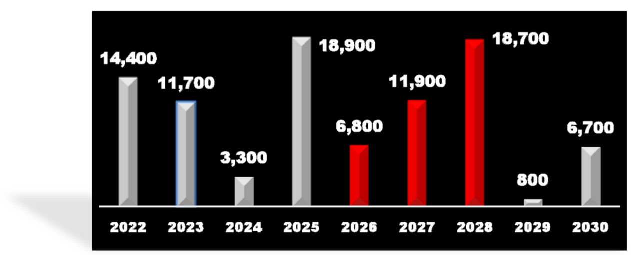
- **Reliability**
  Coal provides most of the attributes that are needed for grid reliability. These include essential reliability services (frequency support, voltage control, and ramping/balancing) and fuel security. The Midcontinent Independent System Operator (MISO) has identified six reliability attributes; coal provides five of the six.

- **Optionality**
  Because of its relatively stable and low price, coal is also a reliable option when other electricity resources are not available or are too expensive. For example, according to EIA, average delivered monthly coal prices over the past 15 years have ranged from \$1.88 to \$2.45/MMBtu, whereas natural gas prices have ranged from \$2.04 to \$15.73/MMBtu. During that period, coal prices averaged \$2.16/MMBtu and natural gas prices averaged \$4.39/MMBtu.

Coal Retirements

Fifteen years ago, the generating capacity of the nation's coal fleet was more than 300,000 megawatts (MW). For a variety of reasons, the coal fleet has shrunk to less than 200,000 MW today but still provided 22% of U.S. electricity last year. By comparison, wind and solar provided 12%. Unfortunately, utilities have announced plans to retire more than half (106,000 MW) of the remaining coal fleet by 2030.

The chart below shows announced coal retirements (in MW) nationwide for each year during 2022-2030. These announced retirements do not take into account the impact of new EPA rules (see next section). The red bars show that announced retirements total 37,400 MW during 2026-2028. This three-year period is highlighted because we estimate that coal retirements will increase considerably during that time, given EPA's likely compliance schedule for six rules.



Coal retirements on such a massive scale and over a relatively short period of time will increase reliability risks significantly by depriving the grid of the reliability attributes of coal-fired generation.

EPA Rules

We estimate that at least six EPA rules will cause coal retirements to rise sharply during 2026-2028 and exacerbate the risk of grid reliability problems. The number of coal retirements will depend on the stringency of the rules.

For example, EPA estimates that its proposed Ozone Transport Rule (aka "Good Neighbor Rule") will cause the retirement of 23,000 MW of coal, more than 10% of the existing coal fleet, by 2025.[iii] (Certain of these rules could also cause the premature retirement of gas- and oil-fired generation.) The other five are the Coal Combustion Residuals (CCR) Rule, Effluent Limitations Guidelines (ELG), Regional Haze Rule, a replacement for the Affordable Clean Energy Rule (carbon regulation), and revised Mercury and Air Toxics Standards (MATS).

EPA could use the Transport Rule, Regional Haze Rule, and a more stringent MATS to require the installation of the most expensive emission controls on most, if not all, coal capacity that does not already have advanced controls. We estimate that 92,000 MW of coal-fired generation, even though already well-controlled, lack the most expensive controls (e.g., selective catalytic reduction and/or flue gas desulfurization (FGD) systems). For example, an FGD system for a large coal unit can easily cost more than $300 million. It is almost certain that a significant number of coal plants would retire early rather than install these expensive controls. The retirement of coal due to EPA rules would add to the 106,000 MW of retirements already announced. Note that this at-risk coal generation does not include retirements (or idling) that are likely to result from the CCR or ELG rules.

Recommendations

We urge Congress to take steps, including the following, to promote grid reliability and minimize coal retirements:

- We commend the committee for holding this important hearing today and encourage the committee to continue its oversight by holding agencies accountable for identifying and properly addressing the many challenges facing the electric sector. One of these challenges is the impact of EPA rules on energy prices and grid reliability. Congress should ensure that EPA pays careful attention to the concerns of the Federal Energy Regulatory Commission (FERC), North American Electric Reliability Corporation (NERC), grid operators, utilities, and utility commissioners and design its rules so as to avoid causing reliability problems and minimize retirements of coal and other dispatchable resources. If EPA is willing, the agency could choose regulatory options that cause the fewest retirements; defer to states about how to implement certain rules; make regulations as flexible as possible, not prescriptive; and provide adequate time for retiring generating capacity to be replaced.
- Congress should pass legislation directing FERC to work with grid operators to identify specific attributes that are necessary for reliability and ensure that market rules provide just and reasonable compensation for those attributes. MISO, for example, has suggested a number of reliability attributes but, at the

same time, indicated that "MISO, and the industry as a whole, are still defining attributes."[iv] Legislation should include a deadline for attributes to be identified and a deadline for FERC to take action on changes to market rules to compensate those attributes.

- Congress should pass legislation requiring federal agencies to conduct formal reliability assessments for rules and policies that could adversely impact grid reliability. The reliability assessments should explain all risks to grid reliability that could result from the rules or policies and describe steps an agency has taken to avoid causing reliability problems. If a rule is projected to cause the retirement of dispatchable resources (coal, natural gas, or nuclear power), the reliability assessment should show that adequate accredited replacement capacity will be placed in service by the time retirements are projected to occur.

In closing, we appreciate the opportunity to submit these comments for the record and would be pleased to provide any additional information that might assist the committee.

---

[i] See, for example, page 6 of PowerPoint presentation "MISO System Attributes Workshop," September 21, 2022. Wind's capacity credit is 16.7%, solar declines from 50% to 20% over time, hybrid declines from 60% to 30%, and battery declines from 100% to 75%. Coal, gas and nuclear are accredited between 90% and 100%.

[ii] These percentages represent the contribution of resources that provided additional electricity due to Elliott.

[iii] See Table 4-14, *Regulatory Impact Analysis for Proposed Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard*, EPA-452/D-22-001, February 2022. https://www3.epa.gov/ttn/ecas/docs/ria/transport_ria_final-csapr_2011-06.pdf

[iv] "Mind the Gap," OMS Resource Adequacy Summit, August 8, 2022.

Forum for American Leadership

Creating an Arsenal of Energy:

How to Bolster U.S. Energy Security and Aid our Allies Confronting Authoritarian Aggression

April 1, 2022

Russia's invasion of Ukraine has roiled global energy markets, spawning oil and gas price spikes that threaten economic growth and geopolitical stability. Moscow's war of choice may instigate the most severe energy crisis since the 1970s.

If crises have silver linings, they force a hard re-examination of core national security and energy policies. The Biden administration and EU member states, mugged this winter by tight markets, soaring consumer prices, and President Putin's aggression, are beginning to rediscover the benefits of energy security, especially ample oil and gas production capacity and infrastructure.

To assist the White House and Congress in their newfound interest in bolstering domestic and international energy security, we suggest the following long-overdue policy changes for Congress and the Executive Branch that would increase the supply and transmission of all forms of energy. These recommendations would enable the United States to leverage its vast energy resources and technological prowess to protect our economy and become an Arsenal of Energy for allies threatened with authoritarian aggression.

Energy Recommendations:

- Until the enactment of a serious and sound national and international climate policy, suspend executive branch regulatory initiatives, including by independent federal agencies, pertaining to greenhouse gas emissions emanating from the exploration, production, transmission, refining, and trade in all forms of energy.
- Abolish the requirement for a national interest permit for any cross-border energy infrastructure projects unless the President finds that it would gravely imperil the national security of the United States.
- Remove executive branch restrictions/bans on U.S. government support, technical assistance (such as at the Departments of Energy, Commerce, Treasury, and State), and financing (U.S. International Development Finance Corporation and Export-Import Bank) for fossil fuel projects and related infrastructure to enable the U.S. Government's ability to support energy security and development of partners and allies.

- Modernize and improve the leasing and management of the federal estate to ensure that taxpayers realize the full and complete benefit of the resource base of the United States.
- Amend the National Environmental Policy Act to enforce timelines and provide expedited permitting for critical national security energy projects.

Oil Recommendations:

- Repeal non-emergency drawdowns from the Strategic Petroleum Reserve (SPR) and direct the Department of Energy to expand the SPR from its current 568 million barrels to one billion barrels and fill it.
- Direct the Department of State to ensure the International Energy Agency (IEA) will:
    - Correct the misunderstanding the IAE has created in the media that the IEA "calls for" a ban on new upstream oil and gas investment and clarify the agency does not oppose new investment.
    - Resume including a Current Policies Scenario in its forecasts to enable political leaders to evaluate the costs and benefits of energy security and climate policies.
    - Make all data and models available to the public at no charge.
- Approve all necessary permits for the Keystone XL pipeline.
- Reverse all Biden Administration policies restricting oil and gas development in Alaska, a critical region where Russia already excels, and establish a powerful U.S. Arctic presence founded on energy projects.
- Congress should reject the President's budget proposal to increase taxes on the oil and gas producers by $40 billion, which would reduce investment in supply and drive-up costs for consumers.

Natural Gas and LNG Recommendations:

- Deem every LNG liquefaction project currently before the Department of Energy to be approved.
- Congress should amend the Natural Gas Act of 1938 to eliminate the public interest determination for LNG exports to non-Free Trade Agreement countries.
- Consider loan guarantees, co-funded with European countries, to expedite the construction of LNG liquefaction and regasification facilities.
- Direct the IEA to bolster the transparency of natural gas markets, especially in Europe.

- Require international lending institutions receiving federal government funding to prioritize natural gas infrastructure, including trade-related terminals, ships, and barges, decentralized production (e.g., Floating LNG), processing facilities, and pipelines.

- Facilitate government and the unlock of private sector financing to enable the U.S. Government's ability to support the energy security and development of partners and allies
    - Remove/overturn executive branch restrictions/bans on U.S. government technical & financing assistance for fossil fuel projects (including at the Departments of Energy, Commerce, Treasury, and State).
    - Create/reinstate programs financing tools and mechanisms to support fossil and infrastructure projects abroad (e.g., LNG regasification) via loan guarantees, risk insurance, and other financing supports (at the Department of State, U.S. International Development Finance Corporation, and Export-Import Bank).

Critical Minerals Recommendations:

- Congress should legislate a streamlined permitting process for mineral extraction and processing in the United States to bolster our competitiveness against established producers in China.

- Congress should provide funds for bolstering critical mineral security through the Defense Production Act of 1950, a federal statute passed during the Korean War that gives the president broad authority to influence the domestic industry in the interest of national defense.

- Congressional leadership should make critical minerals legislation a higher priority. A bill introduced in January 2022 by Sen. Mark Kelly and Sen. Tom Cotton would establish a strategic rare earths reserve and restrict the use of rare earth elements from China in advanced defense technology in the United States.

    - Congress should enact legislation that would force defense contractors to stop buying rare earth-enabled products from China by 2026 and use the Pentagon's Defense Logistics Agency, to create a permanent stockpile of rare earth minerals. The U.S. has only one producing rare earths mine at Mountain Pass, California, run by MP Materials, and cannot currently process rare earth minerals downstream of the mine.

- Congress should consider establishing tax credits, modeled after wind and solar credits, for the domestic production, processing, and recycling of critical minerals.

- Prioritize domestic development and direct any foreign assistance for clean energy mining towards friendly and stable sources of supply, particularly U.S. allies such as Australia and Canada and partners in Latin America.

- Congress should mandate an update to the 2019 Critical Minerals Strategy, issued by the Department of Commerce, and require subsequent updates every two years.
- Establish a "one-stop-shop" consolidating and expediting the processes across the Department of the Interior, Department of Energy, and USDA for permitting, grants, loans, and other incentives to produce, process, and recycle critical minerals.
- Create an Export-Import Bank program that supports exportation of U.S.-origin rare earth mining equipment and services and debt and risk insurance for U.S. rare earth investments abroad.

The Forum *for* American Leadership *(FAL) is a non-profit organization that presents expert analysis and national security recommendations to policymakers in Congress and the Executive Branch.*

Want to learn more about this subject, arrange an interview, or set up a briefing with FAL experts? Contact us here.

Forum for American Leadership

Blueprint for a Serious and Sound Climate Policy

April 18, 2022

Maintaining U.S. living standards and national security depends on the reliable, ample, and affordable flow and conversion of hydrocarbon energy sources – oil, gas, and coal – that supply 80% of the world's growing energy supply. Hydrocarbons lifted humanity out of millennia of darkness and squalor and remain indispensable for all aspects of our daily life, including our domestic food and water supplies, our mobility, national security, and economic growth.

While massively beneficial, hydrocarbons also generate negative externalities, greenhouse gas emissions among them. The climate is warming and human activities, principally accumulating carbon dioxide from hydrocarbon combustion, exert a physically small but growing effect upon it. While the science is far from settled regarding how the climate will change under human influences and the net economic and environmental impacts of those changes, the issue requires a serious and sound policy response.

The prevailing narrative held by the current administration and many activists is ineffective, unscientific, and endangers America's economic growth and national security, as well as the environment it claims to protect. Moreover, it is damningly silent on how to provide reliable and affordable energy to the six billion people who need more energy to improve their lot.

This narrative starts by misrepresenting the science to alarm the public and then demands the expunging hydrocarbon energy from our energy options. The Green New Deal demands the solution of a permanent "wartime mobilization" on the nation and world. Its radical policy prescriptions include extensive government central planning, rationing of energy resources, individual compulsion, and punitive taxation. Their climate narrative defies physics, economic and political realities, human behavior and expectations, and rationality. It will therefore fail, as it should.

The United States and rest of the world need a new and improved blueprint for a sound and serious climate policy. Sound strategy must leverage practical but serious policies to address the real risks posed by human impacts on the climate while protecting free market capitalism, a healthy economy and environment, and national security and providing adequate energy to those who need it. Our blueprint for a sound and serious climate policy has three pillars:

1. Depoliticize and honestly explain to non-experts both the scientific certainties and uncertainties, as well as technical and-economic realities;

2. Apply sound economic and cost-benefit principles to all strategies and fuels; and

3. Legislate at home and lead abroad.

1. Depoliticize and accurately represent the science and technologies

The foundation of any sound and serious climate policy must be complete, transparent, and unbiased descriptions for non-experts of the scientific understanding of climate and human effects upon it. Such honest summaries are critical to assess the costs and benefits of policy options in the context of certainties and uncertainties in the science.

Climate science is complex, and most citizens and leaders are not climate scientists. The public's current understanding of "The Science" is distorted by the media and politicians who demand an almost religious conformity with their narrow viewpoint. They brand anyone – climate experts and non-experts alike - who objects to their alarmist, unscientific decrees to be a "denier." This approach is extremely unhelpful and has backfired, particularly among conservative and independent audiences.

Given the rampant bias and intimidation, it is not surprising that the popular perception of what the science says is quite different from what the actual science says. There is scientific consensus that the climate is warming. And human activities contribute a physically small, but growing, warming influence on the climate, principally by consuming hydrocarbon energy.

However, as the veteran climate scientist and President Obama's Undersecretary for Science at the Department of Energy Steven Koonin (among others) has noted, the science is far from settled about past human contributions to climate and is incapable of producing useful forecasts of future warming, much less human influences upon it. Historical data are often poor, natural influences on the environment are substantial, and the complexity of the physical and biological foundations of the Earth's climate is immense. Modeling only scratches the surface.

The problem is that while the scientific research is typically transparent, rigorous, and objective, the government summaries that inform non-experts in the media, government, and citizenry are not. The U.S. government should subject summaries of the science to the same objective, rigorous peer-review that the actual science enjoys.

FAL's Recommendations for Congress:

- Sustain and enhance funding for scientific observations of the earth's climate system.
- Require that authors of Summaries for Policy Makers (SPMs) of UN IPCC reports be selected by independent, non-government experts and scientists without conflicts of interests.
- Require settlement of differences arising in the peer-review of assessment reports by an independent referee, as is the case for research papers, instead of allowing the assessment report's authors to discard criticisms without explanation, as is the case now.
- Require UN and U.S. assessment reports to undergo a formal review by a group of independent climate experts tasked with challenging the assumptions, conclusions, and presentation, probing for weak spots, distortions, and exaggerations. Require report authors to rebut any points raised.

2. Apply sound principles and leverage all strategies and fuels

Consider all climate strategies

- There are three general climate strategies: (1) mitigating or reducing emissions; (2) geoengineering or enhancing the earth's reflectiveness and removing carbon from the atmosphere; and (3) adaption to live, if not thrive, within a future climate. A sound strategy would consider the cost-effectiveness and national security, economic and environmental impacts of each approach. Congress should require the Biden administration to provide a thorough and objective economic, national security, and environmental cost-benefit analysis of mitigation, geoengineering, and adaption.
- Mitigation strategies should include an emphasis on promoting technological innovation and market-based policies instead of imposing mandates, taxes, and restrictions on consumers and businesses.

Cost-benefit analyses

Policy options stemming from mitigation, geoengineering, and adaption strategies should be evaluated and debated based on their costs and benefits for climate, the economy, human wellbeing, and national security. Accurate information and analyses from existing bodies like the Energy Information Administration (EIA) and the International Energy Agency (IEA) will be a cornerstone of this effort. Policymakers need to start with reliable data and information to make the best policy determinations.

Recommendations for Congress and the Executive Branch:

- Direct the IEA to return to conducting analyses that enable cost-benefit analysis. Specifically, the IEA must resume business-as-usual or Current Policies Scenarios that assume only existing policies in its long-term energy forecasts. The IEA should publish its underlying datasets and make all its analysis, except for mission-sensitive energy security information, available for free public consumption and outside inspection.
- Require the IEA and EIA to conduct energy market "stress tests." For example, analyze the impacts on energy prices if hydrocarbon supply remains constrained but demand trends upwards in the coming decade.
- Require UN and U.S. official analyses and their summaries to consider both the positive and negative economic impacts of various climate projections, including costs.

Rapidly abandoning hydrocarbons without replacements would lead to energy price spikes and shortages, enriching incumbent and authoritarian oil and gas producers like Russia, Venezuela, and Iran. Governments that increased energy prices triggered social upheaval including France, Chile, Brazil, Mexico, Iran, and most recently, Kazakhstan.

- Require the Department of Defense and Department of State to analyze the impacts on U.S. national security of sharp increases in oil and gas prices later this decade.
- President Biden's signature climate policy goal is to eliminate the use of natural gas and coal in the power sector by 2035, even though natural gas and coal currently comprise 40% and 20% respectively, of U.S. electricity generation. Require the EIA to analyze economic, energy security, and emissions impacts of President Biden's proposals to reduce carbon emissions.

- While hundreds of billions of dollars in capital has responded to climate change concerns by investing in a precipitous energy transition, it is by no means clear this capital is backstopped by durable political will to impose necessary transition costs. There is much discussion in energy circles of potentially stranded hydrocarbon assets if there is a successful rapid transition to renewables and minerals, but little examination of the potential stranded assets arising from a *failed* transition.
- Require the Treasury Department and the Federal Reserve to analyze the economic and financial impacts of a successful *and unsuccessful* transition this decade. Foster closer collaboration with the financial community to educate it on realistic scenarios and emissions reductions across industry to protect against dislocation of capital

Prevent dependence on Chinese controlled critical minerals

Officials, investors, and companies are moving aggressively to shift away from petroleum and the internal combustion engine to electric vehicles and batteries. While the commercial viability of this plan remains to be seen, its ultimate success depends on voluntary and unsubsidized mass adoption of electric vehicles and the buildout of the electric grid and electric vehicle charging infrastructure. Should vehicle electrification accelerate, U.S. and global dependence on OPEC+ oil reserve holders will increasingly shift to China, which already dominates the electric vehicle supply chain. U.S. policy must ensure neither China nor or any other power can dominate core global energy systems, including transportation.

FAL's Recommendations for Congress (also included in FAL's April 1, 2022 report "Creating an Arsenal of Energy"):

- President Biden invoked the Defense Production Act of 1950, a federal statute passed during the Korean War that gives the president broad authorities to influence domestic industry in the interest of national defense, to bolster critical mineral security. Congress should provide additional funds if needed to support the necessary surveys, site expansions, and new initiatives.
- Congressional leadership should make critical minerals legislation a higher priority. A bill introduced in January by Rep. Mike Kelly and Sen. Tom Cotton would establish a strategic rare earths reserve and restrict the use of rare earth elements from China in advanced defense technology in the US. This proposal and others could significantly raise the profile of critical mineral supply.
- Enact legislation that would force defense contractors to stop buying rare earth-enabled products from China by 2026 and use the Pentagon's Defense Logistics Agency, to create a permanent stockpile of rare earth minerals. The United States has only one producing rare earths mine at Mountain Pass, California, run by MP Materials, and currently has no capability to process rare earth minerals downstream of the mine.
- Smooth the path for companies to open new mining production and refining facilities. Companies must overcome numerous permitting hurdles and sparse sources of financing for upstream projects, leaving them less competitive against established producers in China.

- Congress should consider establishing tax credits, modeled after wind and solar credits, for the domestic production, processing, and recycling of critical minerals.
- Prioritize domestic development and direct any foreign assistance for clean energy mining towards friendly and stable sources of supply, particularly U.S. allies such as Australia and Canada and partners in Latin America.
- Ease and enable critical minerals recycling, recognizing that domestic mining will also be required to meet future supply.
- Mandate an update to the 2019 Critical Minerals Strategy and require subsequent updates every two years.
- Create streamlined permitting process for mineral extraction and processing in the United States. A major reason for our lack of mineral processing facilities is the difficult, costly, and time-consuming process involved.

<u>Foster innovation and harness free-market enterprise</u>

Given its poor historical track record, governments should not be picking winners in the economy, especially in energy. Any policy responses should be fuel- and technology-neutral and account for market forces.

- Congress should repeal tax benefits and outlays benefitting mature but uneconomic technologies and redirect any futures taxes benefits and outlays toward activities the private sector may bypass, such as basic science and strategic endeavors, including work on minerals dependence and nuclear energy, with the potential for disproportionate security benefits.
- Should fuel switching policies be required, all energy sources should be on the table including nuclear, natural gas, fusion, hydrogen, and advanced biofuels.

3. Legislate on climate at home and lead abroad

<u>Congress should enact durable and effective climate policies</u>

Congress should lead the debate and enact domestic and international climate policy. The current approach led by the executive and judicial branches yields only transient, legally vulnerable, and easily reversible domestic and foreign policies.

- Congress should enact legislation establishing a nonpartisan, expert national commission that integrates technology development, economics, and the strategies, principles, and policy options noted above to develop coherent options for Congress to debate and enact.
- The Senate should ratify any international energy or environmental agreements in which the President has joined.

<u>Lead the world toward a better climate strategy</u>

Emissions policies are inherently global and directly impact trade, energy security, national security, development, human rights, and the environment. World governments and investors are moving ahead with climate policies and seismic investments, with or without the United States. The United States must engage and lead internationally on this issue.

The text of the 2015 non-binding Paris Agreement includes unwarranted alarmism and unrealistic targets. The United States should push for changes that would strengthen the agreement by depoliticizing science, embracing all strategies and fuels, leveraging sound principles, and clearly messaging that the purpose of the agreement is not to establish transfer payments from wealthy countries to poorer ones.

- The improved Paris Agreement should be submitted to the U.S. Senate for ratification, ensuring that U.S. climate policy enjoys a strong and durable political and legal foundation.
- The United States should withdraw from the International Renewable Energy Agency. It serves no purpose that is not already fulfilled by the IEA.
- The United States negotiators should insist that China and other major countries similarly enact legally binding, verifiable policies to backstop their international commitments. The United States must develop both cooperative and non-cooperative methods to verify other countries' emissions reductions.

This paper is a product of the Forum for American Leadership's Energy Working Group

---

Forum for American Leadership

Eight Necessary Steps to defend U.S. Critical Energy Infrastructure from Cyber Attacks
October 4, 2021

A prolonged disruption in energy flows caused by foreign cyberattackers could quickly inflict catastrophic harm to American lives, health, and national security. The May 7, 2021, Colonial Pipeline cyberattack highlighted the importance of engaging in strategic deterrence against future, potentially catastrophic, attacks on our critical energy infrastructure and exposed significant national security gaps that require timely legislative and executive branch remedies. Congress must work with the Executive Branch to take robust steps to deter and punish cyberattacks on critical energy infrastructure while preparing the country to manage future attacks better than it did in May. Actions to date have fallen far short.

Recommendations for Congress to restore deterrence and bolster our domestic defense:

1. Toughen penalties and sanctions for foreign cyber attackers who target critical energy and other vital U.S. infrastructure.

2. The United States should deter, preempt, and punish foreign cyber attackers targeting U.S. critical energy infrastructure as it would Al Qaeda, ISIS, or any other similar foreign-based terrorist planning or using WMD to inflict catastrophic harm to the homeland and Congress should provide additional clear authority, funding, and direction to the Executive Branch to do so.

3. Require the President to notify Congress of countries that support cyber attackers who have, are, or are likely to plan or execute cyberattacks against critical energy infrastructure.

4. To prevent a loss of deterrence, Congress should first require the President to immediately formulate and implement a more robust and cyber defense and offense strategy. Elements of such a strategy should include bolstering our active defense, persistent engagement between the executive and legislative branches and with our allies and defend-forward efforts. Likewise, it should provide clear authority, funding and direction for activities that go beyond such efforts in the case of further attacks on critical energy infrastructure. In addition, the President should be required to inform Congress of the Administration's implementation progress no later than six months after completion, and upon submission, Congress should allocate additional funds to ensure swift and safe implementation of the new strategy.

5. Declare it shall be the policy of the United States to regard any future attempts to disrupt or dismantle U.S. critical energy infrastructure by cyber attackers an act of aggression that shall warrant swift and commensurate retaliation against the attackers and any foreign governments deemed to sponsor them.

6. The federal government should spend more money on human capital and training for public-private cybersecurity programs, which will improve the government's capacity to help companies that are managing critical energy infrastructure assets. Specifically, federal agency representatives should embed with the nation's most essential infrastructure nodes to facilitate intelligence and real-time information sharing on industrial security threats (including attacker methodologies) and defensive countermeasures, as well as to create the ability for the government and industry to collaborate in real-time prior to, during, and in the aftermath of a potential attack.

7. Require critical energy infrastructure owner-operators to immediately inform the federal government of major cyber or any other type of attacks that could impact domestic supply. TSA has mandated reporting for pipelines, but Congress should provide incentives—like liability and regulatory protection to encourage robust and rapid reporting. Reporting mandates should protect the identity of reporting organizations and provide liability and regulatory protection.

8. Require the owner-operator of a critical energy infrastructure asset to consult and obtain the permission of the appropriate federal authority before taking any discretionary action, including the prolonged shutdown of energy flows, that could threaten the economy or national security. Provide an exception in cases when operators do not have sufficient time to consult with federal officials, i.e., to prevent a chain reaction, leak, staving off an ongoing attack, or the like. Normally, the appropriate initial response to a detected cyberattack is to immediately shut down the asset to contain and assess damage. Normally, the federal government should not dictate how private companies operate. However, in the case of a foreign attacks on vital energy infrastructure that could quickly inflict catastrophic damage to the homeland, the federal government must have the final say about whether to implement any prolonged, discretionary shutdown of critical energy flows.

Analysis and Further Information:

The Russian-based attack on the Colonial Pipeline differed critically from the thousands of prior cyberattacks on U.S. persons, businesses, and government agencies. For the first time, foreign attackers directly, if temporarily, disrupted physical energy flows vital for the societal functioning and national security of the United States. The pipeline supplies 45-50% of East Coast liquid fuel supplies, 90 military bases and installations, and seven major airports. The Colonial Pipeline attack resulted in by far the biggest loss of domestic energy supplies due to hostile foreign action against the U.S. homeland.

The most dangerous consequence of the Colonial Pipeline attack, if it is not met with an appropriate response, could be the loss of strategic deterrence. If adversaries believe they can attack critical energy infrastructure without significant cost, further and more extensive attacks are likely. Because energy storage is limited, a prolonged disruption in electricity and liquid fuels would quickly cascade into other critical sectors, inflicting catastrophic harm on American health, public safety, and national security. The Cybersecurity and Infrastructure Security Agency noted in November 2019:

> Energy stakeholders provide essential power and fuels to stakeholders in the communication, transportation, and water sectors, and, in return, the energy sector relies on them for fuel delivery (transportation), electricity generation (water for production and cooling), as well as control and operation of infrastructure (communication).

The Colonial Pipeline attack requires that national leaders review and revise how we protect the homeland from the mounting and dangerous threat posed by foreign cyber attackers. The Constitution assigns responsibility for protecting the homeland from foreign attack to the President as commander-in-chief. At the same time, Congress has a role to play through its constitutionally assigned roles as the body responsible for raising and supporting military forces and authorizing war. Cyberattacks are a potentially lethal and increasingly common means for foreign enemies to attack the United States. A weak or incomplete response to the Colonial Pipeline attack, and failure to rectify the weaknesses and vulnerabilities it exposed, would invite further attacks with potentially devastating consequences. The President has so far not demonstrated that Russia – the state that harbored the Colonial Pipeline attackers – will pay any substantive price nor taken any public action to deter future attacks other than public statements and a conversation with Russia's leadership that doesn't appear to have had any substantive impact.

While investigation is still ongoing, public reports and five congressional hearings have already revealed the attack exposed important challenges in how with address cyberattacks targeting critical energy infrastructure. For example, the federal government was neither informed nor consulted about Colonial Pipeline's decision to pay the ransom, despite FBI recommendations against victims doing so, nor was it consulted beforehand about Colonial Pipeline's decision to protect the pipeline systems by shutting it down temporarily.

There are legitimate concerns about what role the federal government should play in directing how a private company operates its assets, including when to shut down or pay ransom in response to a cyberattack. However, in the case of foreign cyberattacks *on critical energy infrastructure*, the federal government's responsibility to protect the homeland suggests that, at a minimum, the government ought to be consulted when such major actions are taken with respect to such systems, particularly given the enormous potential harm a prolonged energy outage poses to American lives, health, and national security.

Since May, Congress and the Biden administration have taken some reasonable, if only preliminary, steps. They include:

- On May 12, President Biden issued an Executive Order aimed at improving cybersecurity and federal government networks.
- On May 27, DHS issued a security directive that required critical pipeline owners and operators to report confirmed and potential cybersecurity incidents to the federal government.
- On July 20, a second DHS security directive required further steps by hazardous liquids and natural gas pipeline companies.
- On July 28, President Biden signed a National Security Memorandum directing various vanilla interagency actions.
- Several bills working their way through the House and the Senate aim to improve cybersecurity after the Colonial Pipeline attack. They would increase requirements for private companies to report on cybersecurity incidents and provide funding for states and local governments to increase cybersecurity measures.

These measures fall far short of addressing some of the challenges noted above. Bolstering our defenses against catastrophic attacks on critical energy infrastructure requires clear and robust legislative changes that establish clear thresholds for the U.S. response.

The Forum *for* American Leadership *(FAL) is a non-profit organization that presents expert analysis and national security recommendations to policymakers in Congress and the Executive Branch.*

Want to learn more about this subject, arrange an interview, or set up a briefing with FAL experts? Contact us here.

Forum for American Leadership

Congress is Key to Restoring Realism in U.S. Energy Policy
September 28, 2022

Among its many destabilizing and disastrous effects, Russia's war in Ukraine serves as a wake-up call for the need for realism in U.S. and allied energy policy. For too long, those driving the conversation have embraced wishful but misinformed thinking about the pace of energy transitions.

Hydrocarbon energy—oil, gas, and coal—supply 83% of the world's energy and are the lifeblood of modern civilization. While renewable energy's 6% share will continue to grow, energy transitions take many decades and are driven by technological innovation and the private sector, not by government central planning. The current energy crisis highlights the geopolitical infeasibility and economic costs of policies that distort markets and would abruptly starve the United States of hydrocarbon energy that is critical for national security and economic growth.

Those advocating for unrealistic energy transitions have so far not been held accountable by having official energy agencies analyze their unrealistic, extreme proposals. Specifically, the International Energy Agency (IEA) has recently skewed its forecasts to please climate extremists while depriving policy makers of the ability to evaluate costs and benefits of energy and climate proposals. And the U.S. Energy Information Agency (EIA) has failed to provide Congress with feasibility and cost-benefit analyses of President Biden's executive orders and legislative proposals that would mandate abrupt, massive bans on hydrocarbon energy.

To help right the ship and avoid costly and dangerous policy errors, Congress should reassert its role in setting U.S. energy policy. As a starting point, Congress should insist that taxpayer-funded agencies provide unbiased forecasts of energy markets, as well as objective evaluations of proposed energy and climate policies. Toward this end, the Forum for American Leadership Energy Working Group calls for more congressional oversight of the International Energy Agency (IEA) and U.S. Energy Information Administration (EIA) and recommends the establishment of a National Commission on Energy Transition Realism, an expert, non-partisan commission of renowned energy experts to advise government officials and evaluate policy options for energy transitions.

The IEA Must Return to its Security Mission and EIA Must Analyze Extreme Climate Proposals

The Paris-based International Energy Agency is composed of 31 member countries (the U.S. and primarily European nations) and nearly a dozen association countries, including China, India, Brazil, and Argentina. Established in the wake of the 1973 oil crisis, IEA is a forum under the Organization for Economic Co-operation and Development with a mandate to respond to disruptions in the global oil supply and provide policy recommendations, as well as data analysis, on global oil and energy supplies to bolster global energy security. In recent years, however, the IEA has strayed from its assigned role as a watchdog for energy security and instead has transformed into a lap dog for climate zealots advocating for unrealistic energy transition targets. Congress should steer U.S. policy to walk IEA back to its security mission.

Specifically, in recent years the IEA's analyses have veered from security and unbiased analysis to feeding the newly fashionable myth that the United States, and the world, can afford to immediately ban investment in fuels that compromise over 80% of global energy. Moreover, IEA began skewing its energy forecasts to hide the costs of extreme climate policies while depriving elected officials of the ability to make informed cost-benefit assessments of energy and climate proposals. For example, the IEA 2020 World Energy Outlook abolished its "business-as-usual" (BAU, formally known as Current Policies Scenario) reference case scenario, an unwarranted break with decades of forecasting convention that makes it impossible to evaluate the costs and benefits of climate proposals.

Meanwhile, the non-partisan EIA is being underutilized as an agency that was created to deliver accurate energy data and transparent, objective forecasts and analyses to policymakers and the American people. For example, the EIA has so far not provided Congress with analysis of the energy security and economic implications of recent presidential executive orders and legislative climate proposals. The list includes President Biden's executive order calling for the federal government to reduce its emissions by 65% by 2030 and reach net-zero emissions by 2050, as well as a bill (CLEAN Future Act) introduced by Democrats, mirroring the President's campaign proposal, to ban the use of fossil fuels—which currently account for 60% of U.S. electricity generation—in U.S. power plants by 2035.

We recommend Congress seize an opportunity to use hearings, letters, legislation, and other oversight tools to restore realism in U.S. energy policy by focusing on U.S. policy at the IEA and the EIA. Furthermore, the creation of an expert, non-partisan National Commission on Energy Transition Realism will further enable Congress to access fact-based data, analysis, and counsel from energy sector experts.

Congressional Oversight Recommendations

- ***Pressure for a Return to Unbiased Forecasting at the IEA.*** There is a dire need for unbiased global energy forecasting. To please climate change advocates eager to reduce hydrocarbon investment, starting in 2020, the IEA cancelled including a "business as usual" (BAU) reference case scenario in its long-term forecasts and instead only included scenarios that assume quick and easy peak demand. For decades, forecasters used a BAU reference case because it has proven historically accurate, and it enables policymakers to evaluate, compare, and contrast energy and climate policy proposals. The IEA provided no analysis or justification for this radical shift in forecasting convention. Congress should pressure the Biden administration to use the voice and vote of the United States to return the IEA to resume the long-held forecasting convention of including a BAU reference case among its annual forecast scenarios.

- ***Insist the IEA Retract its Call to Ban Oil and Gas Investment to Reach an Impractical Net Zero Target by 2050.*** The IEA's calls for the immediate termination of all new investments in oil and gas run counter to U.S. economic, energy security, and geopolitical interests. U.S. diplomats should push IEA to retract these statements and clarify that the agency does not oppose new investment in oil and gas, which remains critical for the foreseeable future to meet demand and ensure secure, affordable energy for U.S. citizens and the world. The IEA must produce an unbiased, objective assessment of the costs and benefits of achieving net zero emissions by 2050 through government taxes, regulations, and subsidies, using BAU as a reference case scenario.

    - To date, the Biden administration has been complicit in the IEA policy shift from its security mission to climate policy advocacy that is both unrealistic and threatening to U.S. energy security. Following a March 2022 IEA Ministerial Meeting, chaired by U.S. Energy Secretary Jennifer Granholm, the organization issued a press release announcing that the meeting marked "the launch of a new phase of the Agency" in which "the IEA has a new guiding principle: supporting countries in the global effort to attain net zero greenhouse gas emissions in the energy sector by mid-century." The vow to change the Agency's focus to the energy transition and global fight against climate change was also expressed in a joint communiqué.

    - The IEA must return to focusing on its original objectives and obligations under the International Energy Program treaty. If the IEA does not do so, then the United States should evaluate whether continued membership in the IEA as currently structured is consistent with long-standing U.S. domestic energy policy priorities. If not, Congress should shrink U.S. participation in the IEA to purely energy security matters such as coordinating the use of strategic petroleum reserves, its original task.

- ***Instruct the IEA to Bolster the Transparency of Natural Gas Markets.*** As Putin's war in Ukraine enters its sixth month and forecasts show the run-up to a grim winter for European energy supply and security, the time is ripe for the IEA to begin publishing transparent data on natural gas markets and trade flow, especially in Europe. This will exhibit both the effects of European divestment from fossil fuels and the extent of its reliance on imports from undependable authoritarian regimes.

- ***Require the EIA to Analyze Biden Climate Proposals as a Condition for Congressional Funding.*** Congress should insist the EIA do its job by providing timely, astute, and unbiased analyses of the energy and economic consequences of policies proposed or implemented by the President and members of Congress. The EIA has yet to release a cost-benefit and feasibility study of President Biden's executive order requiring the federal government to achieve net-zero carbon emissions by 2050. President Biden has also called for Congress to ban the use of natural gas and coal in U.S. electricity generation by 2035, despite those fuels accounting for 60% of electricity generation. Congress must have the means to analyze the practicality, costs, and benefits of such ambitious policies. To this end, Congress should tie funding for the EIA to its timely issuance of transparent, unbiased modeling of major energy and climate proposals, including analyses of their impact on the U.S. economy and energy security. The American people deserve to know how new energy proposals will affect their daily lives and security, and right now, the EIA is being underutilized and not delivering on its intended and critical mission.

- If the EIA refuses to perform its duty to provide timely and objective analyses of congressional and administration policy proposals, Congress should explore leveraging other statistical and analytical possibilities, such as the General Accounting Office, or recreating an entity like the Office of Technology Assessments.

- ***Establish a National Commission on Energy Transition Realism.*** The Commission should be composed of independent energy experts to advise Congress and the executive branch on the physical, economic, and technological realities involved with energy transitions. Composed of reputable experts selected in a bipartisan fashion, the Commission should furnish policy makers with objective analysis and recommendations. It would serve to identify, challenge, and correct shortcomings in current official data, analysis, and forecasting agencies, helping to avoid the misinformation currently leading to costly policy errors, and to bolster U.S. energy security.

This paper is a product of the Forum for American Leadership's Energy Working Group.

The Forum for American Leadership (FAL) is a non-profit organization that presents expert analysis and national security recommendations to policymakers in Congress and the Executive Branch.

Want to learn more about this subject, arrange an interview, or set up a briefing with FAL experts? Contact us here.

Forum for American Leadership

Setting U.S. Climate Policy Straight: Recommendations for the 118th Congress

December 5, 2022

The Forum for American Leadership's Energy Working Group has produced an agenda for Congress to set U.S. climate policy straight, particularly in international fora such as the IEA and at home in the EIA, drawing on its Blueprint for a Serious and Sound Climate Policy and plan for Congress to Restore Realism in U.S. Energy Policy. The new Republican House majority in the 118th Congress has promised to implement a bold energy policy agenda, and that agenda should include the following climate and critical minerals priorities:

- ***Insist the IEA Retract its Call to Ban Oil and Gas Investment to Reach an Impractical Net Zero Target by 2050.*** U.S. diplomats should push IEA to retract these statements and clarify that the agency does not oppose new investment in oil and gas, which remains critical for the foreseeable future to meet demand and ensure secure, affordable energy for U.S. citizens and the world.
- ***Require the EIA to Analyze Biden Climate Proposals as a Condition for Congressional Funding.*** The EIA has yet to release a cost-benefit and feasibility study of President Biden's executive order requiring the federal government to achieve net-zero carbon emissions by 2050. Congress should tie funding for the EIA to its timely issuance of transparent, unbiased modeling of major energy and climate proposals, including analyses of their impact on the U.S. economy and energy security.
- ***Pressure for a Return to Unbiased Forecasting at the IEA.*** To please climate change advocates eager to reduce hydrocarbon investment, starting in 2020, the IEA cancelled including a "business as usual" (BAU) reference case scenario in its long-term forecasts and instead only included scenarios that assume quick and easy peak demand. Congress should pressure the Biden administration to use the voice and vote of the U.S. to return the IEA to resume the long-held forecasting convention of a BAU reference case in its annual forecast scenarios.
- ***Depoliticize and Accurately Represent the Science and Technologies, Including:***
    - Require that authors of Summaries for Policy Makers (SPMs) of UN IPCC reports be selected by independent, non-government experts and scientists without conflicts of interests.
    - Require settlement of differences arising in the peer-review of assessment reports by an independent referee, as is the case for research papers, instead of allowing the assessment report's authors to discard criticisms without explanation, as is the case now.
    - Require UN and U.S. assessment reports to undergo a formal review by a group of independent climate experts tasked with challenging the assumptions, conclusions, and presentation, probing for weak spots, distortions, and exaggerations. Require report authors to rebut any points raised.
- ***Apply Sound Principles and Leverage All Strategies and Fuels, Including:***
    - Require the DoD and State to analyze the impacts on U.S. national security of sharp increases in oil and gas prices now and in the future.
    - Require the Treasury Department and the Federal Reserve to analyze the economic and financial impacts of a successful and unsuccessful transition this decade. Foster closer

collaboration with the financial community to educate it on realistic scenarios to protect against dislocation of capital.
  - Congress should repeal tax benefits and outlays benefitting mature but uneconomic technologies and redirect any futures taxes benefits and outlays toward activities the private sector may bypass, such as basic science and strategic endeavors, including work on minerals dependence and nuclear energy, with the potential for disproportionate security benefits.

- ***Legislate on Climate at Home and Lead Abroad***
  - Congress should lead the debate and enact domestic and international climate policy. The current approach led by the executive and judicial branches yields only transient, legally vulnerable, and easily reversible domestic and foreign policies.
  - Congress should enact legislation establishing a nonpartisan, expert national commission that integrates technology development, economics, and the strategies, principles, and policy options noted here to develop coherent options for Congress to debate and enact.
- ***Critical Minerals Recommendations:***
  - Legislate a streamlined permitting process for mineral extraction and processing in the United States to bolster our competitiveness against established producers in China.
  - Provide funds for bolstering critical mineral security through the Defense Production Act of 1950, a federal statute passed during the Korean War that gives the president broad authority to influence the domestic industry in the interest of national defense.
  - Make critical minerals legislation a higher priority. A bill introduced in January 2022 by Sen. Mark Kelly and Sen. Tom Cotton would establish a strategic rare earths reserve and restrict the use of rare earth elements from China in advanced defense technology in the United States.
  - Enact legislation that would force defense contractors to stop buying rare earth-enabled products from China by 2026 and use the Pentagon's Defense Logistics Agency, to create a permanent stockpile of rare earth minerals.
  - Consider establishing tax credits, modeled after wind and solar credits, for the domestic production, processing, and recycling of critical minerals.
  - Prioritize domestic development and direct any foreign assistance for clean energy mining towards friendly and stable sources of supply, particularly U.S. allies such as Australia and Canada and partners in Latin America.
  - Mandate an update to the 2019 Critical Minerals Strategy, issued by the Department of Commerce, and require subsequent updates every two years.
  - Establish a "one-stop-shop" consolidating and expediting the processes across the Department of the Interior, Department of Energy, and USDA for permitting, grants, and loans to produce, process, and recycle critical minerals.
  - Create an Export-Import Bank program that supports exportation of U.S.-origin rare earth mining equipment and services and debt and risk insurance for U.S. rare earth investments.

Forum for American Leadership

Restoring U.S. Energy Security: Recommendations for the 118th Congress

December 5, 2022

The Forum for American Leadership's Energy Working Group has prepared concrete recommendations for Congress to help right the ship in U.S. energy policy, drawing on its Steps to Defend U.S. Critical Energy Infrastructure and plan to Create an Arsenal of Energy. The new Republican House majority in the 118th Congress has promised to pursue an ambitious energy policy agenda, and that agenda should include the following priorities:

- ***General Energy Recommendations:***
  - Until the enactment of a serious and sound national and international climate policy, suspend executive branch regulatory initiatives, including by independent federal agencies, pertaining to greenhouse gas emissions emanating from the exploration, production, transmission, refining, and trade in all forms of energy.
  - Abolish the requirement for a national interest permit for any cross-border energy infrastructure projects unless the President finds that it would gravely imperil the national security of the United States.
  - Remove executive branch restrictions/bans on U.S. government support, technical assistance (such as at the Departments of Energy, Commerce, Treasury, and State), and financing (U.S. International Development Finance Corporation and Export-Import Bank) for fossil fuel projects and related infrastructure to enable the U.S. Government's ability to support energy security and development of partners and allies.
  - Modernize and improve the leasing and management of the federal estate to ensure that taxpayers realize the full and complete benefit of the resource base of the United States.
  - Amend the National Environmental Policy Act to enforce timelines and provide expedited permitting for critical national security energy projects.
- ***Oil Recommendations:***
  - Repeal non-emergency drawdowns from the Strategic Petroleum Reserve (SPR) and direct the Department of Energy to expand the SPR from its current 568 million barrels to one billion barrels and fill it.
  - Approve all necessary permits for the Keystone XL pipeline.
  - Reverse all Biden Administration policies restricting oil and gas development in Alaska, a critical region where Russia already excels, and establish a powerful U.S. Arctic presence founded on energy projects.
- ***Natural Gas and LNG Recommendations:***
  - Deem every LNG liquefaction project currently before the Department of Energy to be approved.
  - Congress should amend the Natural Gas Act of 1938 to eliminate the public interest determination for LNG exports to non-Free Trade Agreement countries.
  - Consider loan guarantees, co-funded with European countries, to expedite the construction of LNG liquefaction and regasification facilities.

- Require international lending institutions receiving federal government funding to prioritize natural gas infrastructure, including trade-related terminals, ships, and barges, decentralized production, processing facilities, and pipelines.
- Facilitate government and the unlock of private sector financing to enable USG's ability to support the energy security and development of allies.
- Remove/overturn executive branch restrictions/bans on U.S. government technical & financing assistance for fossil fuel projects (including at the Departments of Energy, Commerce, Treasury, and State).
- Create/reinstate programs financing tools and mechanisms to support fossil and infrastructure projects abroad (e.g., LNG regasification) via loan guarantees, risk insurance, and other financing supports (at the Department of State, U.S. International Development Finance Corporation, and Export-Import Bank).

- ***Restore Deterrence and Bolster Defense of Critical Energy Infrastructure, Including:***
    - Toughen penalties and sanctions for foreign cyber attackers who target critical energy and other vital U.S. infrastructure.
    - Deter, preempt, and punish foreign cyber attackers targeting U.S. critical energy infrastructure as it would Al Qaeda, ISIS, or any other similar foreign-based terrorist planning or using WMD to inflict catastrophic harm to the homeland; provide additional clear authority, funding, and direction to the Executive Branch to do so.
    - Require the President to notify Congress of countries that support cyber attackers who have, are, or are likely to plan or execute cyberattacks against critical energy infrastructure.
    - Require the President to immediately formulate and implement a more robust and cyber defense and offense strategy; the President should be required to inform Congress of the Administration's implementation progress no later than six months after completion, and upon submission, Congress should allocate additional funds to ensure swift and safe implementation of the new strategy.
    - Declare it shall be the policy of the United States to regard any future attempts to disrupt or dismantle U.S. critical energy infrastructure by cyber attackers an act of aggression that shall warrant swift and commensurate retaliation against the attackers and any foreign governments deemed to sponsor them.
    - Spend more money on human capital and training for public-private cybersecurity programs, which will improve the government's capacity to help companies that are managing critical energy infrastructure assets.
    - Require critical energy infrastructure owner-operators to immediately inform the federal government of major cyber or any other type of attacks that could impact domestic supply.
    - Require the owner-operator of a critical energy infrastructure asset to consult and obtain the permission of the appropriate federal authority before taking any discretionary action that could threaten the economy or national security.

COLUMBIA | SIPA
Center on Global Energy Policy

REDUCING RUSSIAN INVOLVEMENT IN WESTERN NUCLEAR POWER MARKETS

BY DR. MATT BOWEN AND THE HONORABLE PAUL DABBAR
MAY 2022

The Russian invasion of Ukraine has led to considerable sanctions being levied against Russia.[1] The nation is a major energy supplier to the world—including of oil, gas, coal, and nuclear fuel and reactors—and its energy sector is one area that has already been targeted. Since the war began, some members of the US Congress have called for banning imports of enriched uranium from Russia as soon as 2022 or as late as 2026.[2] This commentary discusses Russian involvement in the Western[3] nuclear power supply chain, particularly in the United States, as well as policy options to reduce—or end—that involvement.

International Nuclear Fuel Dependencies on Russia

Russia has exported more reactors in recent decades than any other major supplier. In 2021, there were 439 total nuclear power reactors in operation: 38 of them resided in Russia and 42 of them in operation in other countries were of the Russian VVER type (15 of which were in Ukraine). At the end of 2021, 15 Russian-designed reactors were under construction in other nations.

Even for countries that do not host VVERs—including the United States—Russia is a major supplier of several services involved with the manufacturing of nuclear fuel (illustrated in Figure 1). In brief, to make nuclear fuel, raw uranium must be mined out of the ground and milled into uranium-oxide (U_3O_8) before being shipped to facilities that convert it into uranium-hexafluoride (UF_6), which is suitable for enrichment.

Gas centrifuge plants are the type of enrichment facility in use today, where a single centrifuge will take an input stream of UF_6 and produce two output streams: one with a higher percentage of the isotope U-235 than the input stream, and a second with a lower percentage

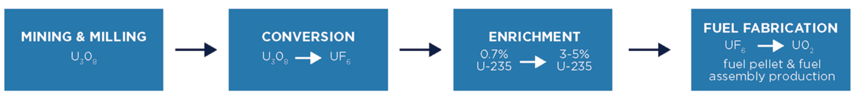
This commentary represents the research and views of the authors. It does not necessarily represent the views of the Center on Global Energy Policy. The piece may be subject to further revision.

Contributions to SIPA for the benefit of CGEP are general use gifts, which gives the Center discretion in how it allocates these funds. More information is available at https://energypolicy.columbia.edu/about/partners. Rare cases of sponsored projects are clearly indicated.

of U-235. Enrichment plants can have thousands of centrifuges, and those centrifuges are connected to one another in different ways depending on the company's goals. Ultimately, an enrichment plant will produce a stream of uranium that is enriched to the desired level (e.g., U-235 content enriched to between 3 percent and 5 percent for use in nuclear power plants) as well as other streams at lower enrichment levels.

In the final step of nuclear fuel making for US power plants, the enriched UF_6 is sent to fuel fabrication facilities where it is converted into UO_2 and fabricated into fuel pellets. Those pellets are stacked inside metal fuel rods that are connected to each other as part of a fuel assembly, and power reactor cores have many fuel assemblies inside of them.

Figure 1: Creating nuclear fuel for reactors



Russia is not one of the leading miners of raw uranium, as shown in Table 1, though it has substantial involvement in the uranium mining operations of some other countries that have greater production. There are multiple allied nations, such as Canada and Australia, who could increase their uranium mining production, if necessary, to make up for any shortfall that might result from cutting off Russian uranium.

Table 1: Global production of uranium from mines and identified recoverable resources

Country	2020 production from mines (metric tons U)	2019 identified recoverable uranium resources (metric tons)
Kazakhstan	19,477	907,000
Australia	6,203	1,693,000
Namibia	5,413	448,000
Canada	3,885	565,000
Uzbekistan (est.)	3,500	132,000
Niger	2,991	276,000
Russia	2,846	486,000
China (est.)	1,885	249,000
US	6	48,000
All other	1,525	1,344,000

Source: World Nuclear Association, "World Uranium Mining Production," accessed March 30, 2022, https://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx.

Note: US production has declined greatly from 1,919 metric tons in 2014, though could be increased again.

The next two steps in the nuclear fuel making process, however, involve a large Russian presence in international markets. As Table 2 shows, Russia accounted for nearly 40 percent of global conversion services in 2020. It also shows that several of the existing Western conversion facilities are operating at low utilization rates, which could be ramped up if there was a need. The ConverDyn conversion facility in the United States, for example, closed in 2017 due in part to challenging market conditions (e.g., decreases in demand from Japan and Germany following the Fukushima accident), but the company announced in 2021 plans to restart operations at the plant in 2023.[4] ConverDyn has also stated that it could potentially reinstate a capacity of 15,000 tons of uranium per year should there be a market signal to do so.[5]

Table 2: Global uranium conversion capacity and utilization in 2020

Country	Nameplate capacity (metric tons U)	Capacity utilization (metric tons U)
France	15,000	2,600
China	15,000	8,000
Canada	12,500	9,000
Russia	12,500	12,000
United States	7,000	0

Source: World Nuclear Association, "Conversion and Deconversion," citing the association's Nuclear Fuel Report (2021 edition), accessed March 30, 2022, https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/conversion-and-deconversion.aspx.

Note: The US conversion facility plans to return to operations in 2023.

Similarly, Russia has a large presence in the international enrichment market. As Table 3 shows, Russia had around a 46 percent share of global enrichment capacity in 2018. The Russian enrichment entity Tenex provided 30 percent of enrichment services to European Union utilities in 2019.[6] South Korea's Korea Hydro & Nuclear Power (KHNP) recently signed a contract with Tenex to supply enrichment services out to 2030, reportedly bringing the total value of Tenex's contracts with KHNP to $2 billion.[7]

Table 3: Global uranium enrichment capacity in 2018 by operator

Operator	(thousands of separative work units/year)
Rosatom (Russia)	28,215
Urenco (UK, Netherlands, Germany, USA)	18,600
Orano (France)	7,500
CNNC (China)	6,750
Other	46

Source: World Nuclear Association, "Uranium Enrichment," citing the association's Nuclear Fuel Report 2019, accessed March 30, 2022, https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx.

The price of enrichment services (described as "separative work units" or "SWUs") has been depressed for years.[8] The low price has led to existing enrichment facilities resorting to a practice known as "underfeeding": having less natural uranium shipped to them and devoting a greater amount of their capability toward enriching the material that has been produced with lower enrichment levels. In other words, the lower price for enrichment services in recent years has meant that the market is using less uranium mining and conversion services in order to produce the needed amount of low-enriched uranium (LEU) for Western power reactors.

However, if there is a policy in place to reduce or eliminate Russian involvement in Western nuclear fuel markets, this would almost certainly lead to a realignment in the supply chain. In the near-term, the market would likely shift to mining more natural uranium (from non-Russian sources) and raising the low utilization rate of existing Western conversion facilities to closer to their nameplate capacities. This would lead to more expensive fuel for operating reactors and thus will not happen without clear policy direction. (There are no legal or regulatory rules preventing this, and thus if this were the cheaper approach, the market would have already done it.)

No Russian fuel fabrication facilities are involved in the final step of making fuel for US nuclear power plants, but this is not the case for many of the countries hosting Russian VVERs. There is, however, some Western capability to fabricate fuel for those VVER reactors to supplant Russian involvement, if countries so chose. Westinghouse, for example, has the capability to make fuel for Russian VVER-1000s,[9] and could develop the capability to make fuel for other VVER models.

"Megatons to Megawatts" and the Russian Suspension Agreement

The high level of Russian enriched uranium in US nuclear fuel has a unique history and factors into how the United States got to where it is today in terms of diminished domestic capabilities. In 1993, the Russian Federation and the United States signed an agreement to eliminate excess highly enriched uranium (HEU) from dismantled Russian nuclear weapons.[10] From 1993 to 2013, downblended Russian HEU provided about half of the enriched uranium used in US power reactors, as part of the "Megatons to Megawatts" program.

Separate from the Megatons to Megawatts program, exports of Russian uranium products into the US fuel market have been limited for decades by what is colloquially referred to as "the Russian suspension agreement." The original agreement was signed on October 16, 1992, when the US Department of Commerce suspended an anti-dumping duty investigation on uranium from the Russian Federation (hence, "suspension agreement").[11] The agreement restricted the amount of Russian uranium products that could enter the US market, and it has been amended several times since it was first signed. It had previously been scheduled to expire at the end of 2020, but the amendment signed that year extended the agreement to 2040.

In the most recent amendment, the US Department of Commerce and the Russian state nuclear corporation Rosatom agreed to lower the amount of Russian uranium products allowed for export into the US market, and to limit the percentage of US enrichment demand met by Russia to 15 percent starting in 2028. In other words, even before the war in Ukraine began, the US government had been taking steps to reduce Russian involvement in US nuclear fuel markets, both for strategic and commercial reasons.[12] Some of the limits in the suspension agreement are reproduced in Table 4, though only out to 2030.

Table 4: Partially reproduced suspension agreement with limits on Russian exports

Export limit year	Percentage of US enrichment demand	Total export limit in kilograms U as LEU (A)	Total export limit in kilograms U-235 content (B)	USEC export limit allocation in kilograms U-235 (E) (Subset of B)
2021	24%	596,682	26,254	7,780
2022	20%	489,617	21,543	7,430
2023	24%	578,877	25,471	10,700
2024	20%	476,536	20,968	10,300
2025	20%	470,376	20,697	10,300
2026	20%	464,183	20,424	10,700
2027	20%	459,083	20,200	10,600
2028	15%	344,312	15,150	4,100
2029	15%	340,114	14,965	0
2030	15%	332,141	14,614	0

Source: US Department of Commerce, "2020 Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation," https://www.federalregister.gov/documents/2020/10/09/2020-22431/2020-amendment-to-the-agreement-suspending-the-antidumping-investigation-on-uranium-from-the-russian.

Note: The table does not show two columns in the agreement, "C" and "D": "Cap for LEU exports pursuant to sales of EUP [enriched uranium product] (may include sales of SWU plus conversion) in kilograms U-235" and "Cap for additional LEU exports pursuant to sales of SWU plus conversion Only in kilograms U-235."

As the Table 4 shows, one US company is specifically mentioned in the agreement: USEC,[13] which is today named Centrus. Centrus (located in Ohio) is the sole company with installed enrichment capacity in the United States that is not foreign owned (Urenco, which operates the only commercial-scale enrichment plant in the United States, is owned by the British, Dutch, and German governments). Part of Centrus's current business model is purchasing enrichment services from Tenex in Russia and supplying Russian LEU to US customers, nominally through 2028, and a congressional intervention to block out Russia, such as the bills mentioned earlier would do, would terminate those contracts.[14]

Fuel Supply for Non-Light Water Reactors

Previous to the Ukraine invasion, there was a different potential involvement that Russian enriched uranium might have had with some of the future advanced reactors under development in the United States. In recent decades, a variety of private companies have been founded to pursue commercialization of different advanced reactor designs. Some of these designs use uranium with significantly higher enrichments than light water reactors use: instead of 3–5 percent, the enrichments may be as high as 15–19.75 percent. Currently, the only commercial source of this high-assay low-enriched uranium (HALEU) is Russia.

In 2020, the US Department of Energy (DOE) announced a series of large cost-share awards with some of these private reactor developers.[15] For the biggest demonstrations, DOE would contribute a share of the demonstration costs, as long as private entities more than matched that investment. Given that Russia has been the only commercial source of HALEU, some advanced reactor developers were either planning to obtain—or at least considered obtaining—their first fuel load's worth of HALEU from Russia. In 2018, the Nuclear Energy Institute reported (based on company inputs) that estimated HALEU needs might potentially ramp up from tens of metric tons per year in the mid-2020s to over a 100 metric tons per year in the late 2020s.[16]

Existing enrichment companies, such as Urenco, Orano, GLE, and Centrus, could make HALEU, but these companies would likely be hesitant to invest too much in building HALEU infrastructure and completing NRC licensing without being confident there will in fact be a profitable market for the product. Industry estimates that establishing a commercial-scale production capability would cost more than $500 million.[17] On the reactor developer side, if a single company were to come to an enrichment company and ask to buy only the amount of HALEU they needed—perhaps at the level of tens of metric tons—the price per kilogram of HALEU would be much higher than if the associated development costs could be spread over a large order. Challenges—real and perceived—with HALEU fuel procurement could in turn deter investment in the deployment of some non-light water reactor designs. This is the "chicken and egg" dilemma that the US government is currently grappling with.[18] Buying the first core loads of HALEU from Russia would have enabled reactor developers to easily meet their stated timelines for when they needed fuel. It would also have allowed the federal government to gauge at some level how the construction and operation of the first non-light water reactor projects were executed before committing potentially large amounts of money toward domestic HALEU production.

If the Russian supply option were off the table, however, the United States would need to turn in earnest to remaining possibilities. Congress directed DOE to establish a HALEU availability program in the Energy Act of 2020. At the end of 2021, DOE had already put out a request for information regarding planning for the establishment of a program to support the availability of HALEU for civilian domestic research, development, demonstration, and commercial use,[19] and subsequently received a variety of responses.[20] Multiple bills in the 117th Congress have been introduced that would further authorize and direct DOE to pursue HALEU production programs.[21] Centrus has been working with DOE since 2019 to demonstrate a capability to produce HALEU and obtained NRC approval for HALEU production in 2021.[22]

Exposure of Global Nuclear Power to Russia for Nuclear Components, Services, and New Construction

In addition to a significant exposure to Russia in the uranium fuel chain, the global nuclear market relies on Russia for equipment and construction efforts. Many reactors in operation and under construction around the world are using Russian reactor technology. Given that most of the exported Russian reactors are of the VVER/pressurized water reactor design, we will focus on that technology for this analysis.

Existing/Operating Russian Designed and Built Nuclear Reactors

Operators of existing nuclear reactors can have significant supply chain exposure to original equipment manufacturers ("OEMs") of their reactor type. Reactors have unique components that their OEM designed and built for their specific reactor type, including (focusing on the pressurized water reactor design):

- Most of the internal components of the reactor vessel, such as the fuel assembly structure, coolant, and flow components; the reactor vessel and head; and the control rod structures
- Components in the rest of the nuclear primary system (i.e., the system immediately connected to the reactor core) are also from the OEM, including the pressurizer, steam generators, and the primary water pumps and related systems

In addition to primary components, in various settings around the globe, many different parts of VVER power plant secondary reactor systems could be from Russian origin, including:

- Control room and reactor control systems
- Secondary pumps and their control systems
- Turbine generators and their control systems

Examples of services and components provided to global nuclear customers listed by Rosatom, the state nuclear power company of Russia and the OEM of the VVER reactors, include: assessing and developing key nuclear infrastructure components, large life extension projects, regular supply of spare parts and equipment, and power capacity expansion uprates.[23] In 2019 (the last year Rosatom published an annual report), Rosatom overseas revenues for nuclear fuel assemblies (excluding the uranium supply chain), reactor components, and services was $1.9 billion.[24]

While there is little data on annual maintenance and capital costs for Russian VVER reactors, public data from US nuclear reactors show that annual capital costs for nuclear power plants are $5.35/megawatt-hour (MWh), and annual maintenance costs are $18.27/MWh,[25] of which about a quarter are for physical supplies that have to be purchased.

The list of VVER reactors operating globally (excluding Russia, Belarus, Iran, and China, since those countries are likely to continue using Russian supplies) are listed in Table 5.

Table 5: Global operating VVER reactors in 2021, excluding those in Russia, Belarus, Iran, and China

Country	Reactor name	Model	Megawatt electrical net
Armenia	Armenian-2	VVER V-270	415
Bulgaria	Kozloduy-5	VVER V-320	1,003
Bulgaria	Kozloduy-6	VVER V-320	1,003
Czech Republic	Temelin-1	VVER V-320	1,027
Czech Republic	Temelin-2	VVER V-320	1,029
Czech Republic	Dukovany-1	VVER V-213	468
Czech Republic	Dukovany-2	VVER V-213	471
Czech Republic	Dukovany-3	VVER V-213	468
Czech Republic	Dukovany-4	VVER V-213	471
Finland	Loviisa-1	VVER V-213	507
Finland	Loviisa-2	VVER V-213	507
Hungary	Paks-1	VVER V-213	479
Hungary	Paks-2	VVER V-213	477
Hungary	Paks-3	VVER V-213	473
Hungary	Paks-4	VVER V-213	473
India	Kudankulam-1	VVER V-412	932
India	Kudankulam-2	VVER V-412	932
Slovakia	Bohunice-3	VVER V-213	466
Slovakia	Bohunice-4	VVER V-213	466
Slovakia	Mochovce-1	VVER V-213	436
Slovakia	Mochovce-2	VVER V-213	469
Ukraine	Zaporozhye-5	VVER V-320	950
Ukraine	Zaporozhye-6	VVER V-320	950
Ukraine	Rovno-1	VVER V-213	381
Ukraine	Rovno-2	VVER V-213	376
Ukraine	Rovno-3	VVER V-320	950
Ukraine	Khmelnitski-1	VVER V-320	950
Ukraine	Khmelnitski-2	VVER V-320	950
Ukraine	South Ukraine -1	VVER V-320	950
Ukraine	South Ukraine -2	VVER V-338	950

continued on next page

Country	Reactor name	Model	Megawatt electrical net
Ukraine	South Ukraine -3	VVER V-320	950
Ukraine	Zaporozhye-1	VVER V-320	950
Ukraine	Zaporozhye-2	VVER V-320	950
Ukraine	Rovno-4	VVER V-320	950
Ukraine	Zaporozhye-3	VVER V-320	950
Ukraine	Zaporozhye-4	VVER V-320	950
Ukraine	Zaporozhye-3	VVER V-320	950
Ukraine	Zaporozhye-4	VVER V-320	950

Source: International Atomic Energy Agency, "Power Reactor Information System," https://pris.iaea.org/pris/."

Exposure of existing nuclear operators to these OEM replacement components is more acute than for typical energy infrastructure for a couple reasons. First, the design requirements for nuclear systems are significantly more stringent than for typical power systems, given failure events are potentially much more acute. As a result, maintenance and procurement teams at existing operators typically return to the OEM for many critical system efforts, and alternative supply chains for replacement nuclear components don't tend to be well developed. Additionally, nuclear operators culturally tend to be very conservative on procurement of maintenance and upgraded equipment, and tend to default to purchasing from the plant OEM.

There is little public data on maintenance and capital expenditure purchase costs for operating VVER reactors. However, VVER reactors in general are of similar designs, sizes, and capacity factors to US light water reactors, so using the robust US data available is a reasonable surrogate for VVER operating costs. Assuming an 80 percent capacity factor for operating reactors, US data would suggest purchases of capital supplies required to run the existing global fleet is $4.3 billion annually.

While some of the countries listed in Table 5 are less likely to embargo Russian businesses as a result of the Ukraine war, the countries in Europe such as in Bulgaria, Czech Republic, Finland, Hungary, and Slovakia could face important impacts on their abilities to continue to operate their facilities due to parts and services needed from their VVER OEM. The VVERs in Ukraine are in a uniquely challenging position. Some non-Russian engineering and construction companies have built capabilities to replicate Rosatom VVER components, but replicating OEM designs and manufacturing can be a challenge for nuclear power plants.

New Nuclear Power Plant Construction

In addition, Russia, through Rosatom, has been a major potential provider of new nuclear power plants globally. Many plants around the world have been conducting multiyear design and site preparation efforts for the construction of VVER reactors, and many are already in construction. A work stoppage or abandonment of these projects would provide significant financial and energy supply impacts to those countries.

VVER reactors globally under construction or publicly identified as planned to be constructed (excluding those in Russia, Belarus, Iran, and China) are listed in Table 6.

Table 6: Global VVER reactors under construction or in planning in 2021, excluding those in Russia, Belarus, Iran, and China

Country	Reactor name	Model	Megawatt electrical net
Bangladesh	Rooppur-1	VVER V-523	1,080
Bangladesh	Rooppur-2	VVER V-523	1,080
Finland	Hanhikivi-1	VVER V-522	1,200
Hungary	Paks-5	VVER V-527	1,185
Hungary	Paks-6	VVER V-527	1,185
India	Kudankulam-3	VVER V-412	917
India	Kudankulam-4	VVER V-412	917
Slovakia	Mochovce-3	VVER V-213	440
Slovakia	Mochovce-4	VVER V-213	440
Turkey	Ankkuyu-1	VVER V-509	1,114
Turkey	Ankkuyu-2	VVER V-509	1,114
Turkey	Ankkuyu-3	VVER V-509	1,114
Turkey	Ankkuyu-4	VVER V-509	1,114

Source: International Atomic Energy Agency, "Power Reactor Information System," https://pris.iaea.org/pris/.

Note: The IAEA lists two VVERs as having been under construction at the Khmelnitski site in Ukraine since 1986/1987, but they have not actually been under construction for many years.

While some of the above are less likely to halt new Russian designed VVER reactor projects as a result of the Ukraine war, ones in Europe such as Finland, Hungary, Slovakia, and possibly Turkey may reconsider development of those plants. Finland already seems to have decided against building a Russian VVER since the Ukraine invasion.[26] As a result, they might have to consider other reactor vendors or look at non-nuclear technologies to fulfill their power needs. Given that power plant development cycles take many years, this could have significant negative impacts on their energy supply and policies.

Policy Options to Move Away from Russian Nuclear Energy Supply Chains

Countries considering new reactors can simply choose other vendors if they don't want to be dependent on Russia for fuel, equipment, and services. The US, France, Republic of Korea, and China are all viable reactor suppliers.

Countries that currently host Russian VVERs have a more complicated set of choices to make. They are likely dependent on Russia not just for fuel but for reactor equipment and services. There are some alternatives at least for replacing Russian fuel. Westinghouse, as mentioned, is able to make fuel assemblies for VVER-1000s, and it is possible the company will be able to manufacture fuel for other VVER designs in the near-term.[27] Westinghouse is also able to supply some services to VVERs.[28]

For all other countries with non-VVER power reactors, Russian-mined uranium is not the challenge in extricating themselves from involvement with Russia in procuring their fuel. As shown in Table 1, Russia only mines approximately 6 percent of the uranium produced each year, and other countries can expand production if necessary. Fuel fabrication is also not the challenge.

Instead, policy options to replace Russia's large presence in global conversion and enrichment services would be where the United States and its allies would need to focus their attention. The conversion and enrichment capacities in Canada, France, Germany, the Netherlands, the United Kingdom, and the United States are enough to replace at least some of the Russian fuel services involved in fueling Western nuclear power plants with greater uranium mining. More investment in mining, conversion, and enrichment facilities may be necessary to fully extricate Western nuclear fuel chains from Russian involvement. However, adding sufficient new conversion capacity and enrichment capacity will take years to accomplish.

In any case, mining, conversion, and enrichment suppliers in the West will be looking to national governments to provide clear policies before they invest money in new facilities and capabilities. Their worry will be that in a year or two, perhaps less, Russian uranium products will be allowed back into national markets and will undercut them, causing them to lose out on their investments. National laws that impose a date for ceasing supplies from Russia—such as the bills cited earlier—would send a clear signal to private markets in the United States and elsewhere so they can adjust efficiently.

International meetings with Western governments could be held to discuss how best to coordinate a reduction or elimination of Russian involvement in their nuclear fuel supply chains. The natural uranium, conversion, and enrichment markets are internationally linked, and national decisions in one country will have impacts on other programs. It will be important for these governments to communicate to the public that all policy options to remove dependency on Russian supply chains are likely to raise costs for operating plants.

The recently created Civil Nuclear Credit Program, established by the 2021 Bipartisan Infrastructure Law,[29] may be able to assist in limiting these impacts, as could the material in DOE's American Assured Fuel Supply.[30]

The optimal timing of full extrication—for either all Western nations or the United States alone—is beyond the scope of this paper but would certainly be an issue DOE would need to study immediately if it intends to act. The total impacts of a shutoff of Russian uranium products in 2022 are unknown to the authors; the relevant information may exist outside the public realm, though congressional hearings could uncover some of these details. Given the long lead times for ordering nuclear fuel assemblies, the authors do not believe it likely that such a decision would result in outages due to lack of fuel at US power reactors this year, but it is harder to assess impacts in 2023. Other Western governments may also want to use the same non-Russian mining, conversion, and enrichment facilities as part of a similar strategy to reduce Russian involvement in their power markets, raising the prospect of competition for services. The only US conversion facility is still on standby and will not return to producing 7,000 tons of uranium per year until 2023; increasing that capacity to 15,000 tons per year will take longer.

Given these factors and the unique historical context for large amounts of Russian material in US commercial reactors (i.e., the Megatons to Megawatts program), the authors reason that ramping down Russian supplies would happen more smoothly over a period of years not months. This is more consistent with the types of lead times that reactor owners employ for contracts involving different stages of the nuclear fuel cycle.[31] The US government could simultaneously facilitate meetings with Western governments that have mining, conversion, and enrichment facilities to discuss policy options to hasten a greater capability to supplant Russian conversion and enrichment services. Such efforts to strengthen capability may involve a move away from underfeeding existing Western enrichment capacity using increased uranium mining and greater utilization of conversion services. The US government could also consider supporting the construction of a national security compliant fuel chain, given the lack of one using only US-origin technology, equipment, and materials—a national security concern noted by external reports.[32]

It is possible that a nearer-term or even immediate suspension of Russian imports could produce disruptions to the US market that are acceptably small. If this were the case and would not cause existing plants to shut down or experience extended outages, an earlier cutoff is preferable to a later one to minimize dollars sent to Russia as well as US exposure to Russian supply.

Finally, with regard to HALEU production, a logical next step that DOE could pursue is to issue a request for proposals on how best to establish a HALEU production line and see what the private sector proposes. Reports have suggested a combination of government cost-sharing and off-take agreements could form a viable strategy.[33]

Notes

1. Richard Nephew, "The Sanctions War Is Just Beginning: Targeting Russia Was the Easy Part," *Foreign Affairs*, March 31, 2022, https://www.foreignaffairs.com/articles/russian-federation/2022-03-31/sanctions-war-just-beginning.

2. For example, Senator Barrasso introduced legislation with several cosponsors to ban Russian uranium imports 45 days after enactment: https://www.barrasso.senate.gov/public/index.cfm/2022/3/barrasso-leads-bill-to-ban-russian-uranium-imports; Senator Manchin and Senator Risch introduced legislation that would not allow Russian LEU imports as of 2026: https://www.congress.gov/bill/117th-congress/senate-bill/4064.

3. For the purposes of this paper, "Western" means North America, Europe, Japan, and South Korea.

4. "US conversion plant gears up for next 40 years," *World Nuclear News*, April 14, 2021, https://www.world-nuclear-news.org/Articles/US-conversion-plant-gears-up-for-next-40-years.

5. ConverDyn, HALEU Workshop, April 28–29, 2020, https://gain.inl.gov/HALEU_Webinar_Presentations/10-Critchley,ConverDyn,Rev1-28Apr2020.pdf.

6. Euratom Supply Agency, "Annual Report 2020," table 6 on page 22, https://euratom-supply.ec.europa.eu/publications/esa-annual-reports_en.

7. "Russia's Tenex wins tender for fuel supply to South Korea," *Nuclear Engineering International*, January 25, 2020, https://www.neimagazine.com/news/newsrussias-tenex-wins-tender-for-fuel-supply-to-south-korea-7653727.

8. "Enrichment excess is here to stay," *Nuclear Engineering International*, October 13, 2015, https://www.neimagazine.com/features/featureenrichment-excess-is-here-to-stay-4691321/.

9. Westinghouse, "VVER," https://www.westinghousenuclear.com/operating-plants/nuclear-fuel/vver.

10. Lawrence Livermore National Laboratory, "A Transparent Success: 'Megatons to Megawatts' Program," Science & Technology Review, April/May 2013, https://str.llnl.gov/content/pages/april-2013/pdf/4.13.3.pdf.

11. International Trade Administration, "2020 Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation," Federal Register, October 9, 2020, https://www.federalregister.gov/documents/2020/10/09/2020-22431/2020-amendment-to-the-agreement-suspending-the-antidumping-investigation-on-uranium-from-the-russian.

12. US Department of Commerce press release, "U.S. Department of Commerce Finalizes 20-Year Amendment to the Suspension Agreement on Uranium from the Russian Federation," October 6, 2020, https://2017-2021.commerce.gov/news/press-releases/2020/10/us-department-commerce-finalizes-20-year-amendment-suspension-agreement.html.

13. USEC was the private entity created from the DOE's enrichment operation. See: https://www.centrusenergy.com/who-we-are/history/.

14. Centrus, 2020 Annual Report, https://investors.centrusenergy.com/static-files/77087849-8051-4919-a125-d0a8600bcc98.

15. For example, DOE announced cost-share awards with TerraPower and X-energy on October 13, 2020, US Department of Energy press release, "U.S. Department of Energy Announces $160 Million in First Awards under Advanced Reactor Demonstration Program," October 13, 2020, https://www.energy.gov/ne/articles/us-department-energy-announces-160-million-first-awards-under-advanced-reactor.

16. Nuclear Energy Institute letter to Secretary of Energy Rick Perry, July 5, 2018, https://www.

nei.org/CorporateSite/media/filefolder/resources/letters-filings-comments/letter-perry-haleu-20180705.pdf.

17. Nuclear Energy Institute, "Establishing a High Assay Low Enriched Uranium Infrastructure for Advanced Reactors," January 2022, https://www.nei.org/resources/reports-briefs/establishing-a-haleu-infrastructure-for-advanced-r.

18. See comments by the French enrichment company, Orano, in "Certainty of demand key to HALEU supply, says Orano," *World Nuclear News*, March 15, 2022, https://www.world-nuclear-news.org/Articles/Certainty-of-demand-key-to-HALEU-supply-Orano.

19. US Department of Energy, "Request for Information (RFI) Regarding Planning for Establishment of a Program To Support the Availability of High-Assay Low-Enriched Uranium (HALEU) for Civilian Domestic Research, Development, Demonstration, and Commercial Use," Federal Register, December 14, 2021, https://www.federalregister.gov/documents/2021/12/14/2021-26984/request-for-information-rfi-regarding-planning-for-establishment-of-a-program-to-support-the.

20. For example, the Nuclear Energy Institute's response is here: https://www.nei.org/CorporateSite/media/filefolder/resources/letters-filings-comments/NEI-02-14-22_DOE_HALEU-RFI-Response.pdf.

21. S.4064 and S.4066 from the 117th Congress would support domestic HALEU production.

22. "Centrus receives licence for HALEU production," *World Nuclear News*, June 15, 2021, https://www.world-nuclear-news.org/Articles/Centrus-receives-licence-for-HALEU-production.

23. Rosatom, "Performance of State Atomic Energy Corporation Rosatom in 2019," https://www.report.rosatom.ru/go_eng/go_rosatom_eng_2019/rosatom_eng_2019.pdf?msclkid=a5334dd3cf9f11ec964dc636df2b47ef.

24. Ibid.

25. Nuclear Energy Institute, "Nuclear Costs In Context," November 2021, https://www.nei.org/resources/reports-briefs/nuclear-costs-in-context.

26. Richard Milne, "Finnish group abandons plans for Russia-backed nuclear power plant," *Financial Times*, May 2, 2022, https://www.ft.com/content/5e7730b5-be55-48a5-8f55-f67d6fb80d77.

27. For example, fuel development for VVER-440 has been underway. See: "Westinghouse fuel assemblies delivered to Rovno NPP," *Nuclear Engineering International*, July 22, 2021, https://www.neimagazine.com/news/newswestinghouse-fuel-assemblies-delivered-to-rovno-npp-8919297.

28. Westinghouse, "Westinghouse and NT-Engineering Sign MoC to Increase Nuclear Reactor Power," September 22, 2021, https://info.westinghousenuclear.com/news/westinghouse-and-nt-engineering-sign-moc.

29. US Department of Energy press release, "DOE Establishes $6 Billion Program to Preserve America's Clean Nuclear Energy Infrastructure," February 11, 2022, https://www.energy.gov/articles/doe-establishes-6-billion-program-preserve-americas-clean-nuclear-energy-infrastructure.

30. US Department of Energy, "Notice of Availability: American Assured Fuel Supply," Federal Register, vol. 76, no. 160, August 18, 2011, https://www.govinfo.gov/content/pkg/FR-2011-08-18/pdf/2011-21067.pdf.

31. "Public Comments on Behalf of the Ad Hoc Utilities Group," September 25, 2018, page 17, https://www.regulations.gov/document/BIS-2018-0011-0245: "In addition, on average, nuclear generators allow for lead times of 1.7 years for contracts involving various stages of the fuel cycle."

32. Energy Futures Initiative, "The U.S. Nuclear Energy Enterprise: A Key National Security Enabler," August 2017. https://energyfuturesinitiative.org/wp-content/uploads/sites/2/2022/02/The-U.S.-Nuclear-Energy-Enterprise_A-Key-National-Security-Enabler_Report_August-2017.pdf.

33. Nuclear Innovation Alliance, "Catalyzing a Domestic Commercial Market for High-Assay, Low-Enriched Uranium," April 2022, https://www.nuclearinnovationalliance.org/catalyzing-domestic-commercial-market-haleu.

About the Authors

Dr. Matt Bowen is a Research Scholar at the Center on Global Energy Policy at Columbia University SIPA, focusing on nuclear energy, waste, and nonproliferation. He was formerly a Nuclear Policy Fellow at Clean Air Task Force and a Senior Policy Fellow at the Nuclear Innovation Alliance.

Dr. Bowen has written reports on federal and state policies to encourage advanced reactor development, and has also published papers on reforming U.S. nuclear export controls. During the Obama Administration, he was an Associate Deputy Assistant Secretary in the Office of Nuclear Energy and a Senior Advisor in the Office of Nonproliferation and Arms Control at the U.S. Department of Energy (DOE). Previous to working at DOE, he was an AAAS/APS Science Fellow for Senate Majority Leader Harry Reid. Dr. Bowen received a Bachelor of Science degree in physics from Brown University and a Ph.D. in theoretical physics from the University of Washington, Seattle. He has held positions at the National Academies with the Board on Physics and Astronomy, the Board on Energy and Environmental Studies, and the Division on Engineering and Physical Sciences.

The Honorable Paul M. Dabbar is a Distinguished Visiting Fellow at the Center on Global Energy Policy at Columbia University SIPA. He is also CEO and Co-founder of Bohr Quantum Technology, developing and deploying technologies for the emerging quantum internet.

Prior to that in 2017, the U.S. Senate unanimously confirmed Mr. Dabbar to serve as the

Department of Energy's fourth Under Secretary for Science, where he served from 2017-2021. He managed several areas of the Department, as well as serving as the Department's principal advisor on fundamental energy research, energy technologies, science, and commercialization of technologies. He managed over 60,000 people with a budget of $15 billion p.a. at over 100 sites, including managing the majority of the U.S. National Laboratories.

Areas of research he managed included basic energy sciences, nuclear and high energy physics, advanced computing, fusion, and biological & environmental research. He also led the largest environmental remediation program in the U.S., addressing the operations of nuclear weapons and commercial power production, completing several multi-billion dollar construction projects. He also led various new efforts to commercialize innovations arising from the National Labs. He co-led several new energy innovation efforts, including the Energy Storage Grand Challenge, as well as the passage and implementation of the National Quantum Initiative Act.

Mr. Dabbar was awarded in 2021 the Secretary of Energy's senior DOE award, the James R. Schlesinger Medal, for leadership on developing energy technologies, discovery science, environmental management, and the National Quantum Initiative.

During his time in government service, Mr. Dabbar traveled to both the geographic North and South Poles. He traveled to the North Pole by submarine to conduct environmental research while in the Navy, and to the South Pole in support of high energy physics astronomy missions of DOE at South Pole Station.

Prior to confirmation as Under Secretary, Mr. Dabbar worked in operations, finance, and strategy roles in the energy sector. As a Managing Director at J.P. Morgan, he had over $400 billion in transaction experience across all energy sectors. In addition, he had a senior leadership role for the company's commodity trading business, including energy. Before joining J.P. Morgan, Mr. Dabbar served as a nuclear submarine officer. He has been a lecturer at the U.S. Naval Academy, and conducted research at the Johns Hopkins University Applied Physics Laboratory. Mr. Dabbar is a member of the Council on Foreign Relations.

Mr. Dabbar has a bachelors from the U.S. Naval Academy, is a graduate of the U.S. Navy's nuclear power and nuclear engineer programs, and a masters from Columbia University.

ABOUT THE CENTER ON GLOBAL ENERGY POLICY

The Center on Global Energy Policy at Columbia University SIPA advances smart, actionable and evidence-based energy and climate solutions through research, education and dialogue. Based at one of the world's top research universities, what sets CGEP apart is our ability to communicate academic research, scholarship and insights in formats and on timescales that are useful to decision makers. We bridge the gap between academic research and policy — complementing and strengthening the world-class research already underway at Columbia University, while providing support, expertise, and policy recommendations to foster stronger, evidence-based policy. Recently, Columbia University President Lee Bollinger announced the creation of a new Climate School — the first in the nation — to tackle the most urgent environmental and public health challenges facing humanity.

Visit us at www.energypolicy.columbia.edu

@ColumbiaUEnergy

ABOUT THE SCHOOL OF INTERNATIONAL AND PUBLIC AFFAIRS

SIPA's mission is to empower people to serve the global public interest. Our goal is to foster economic growth, sustainable development, social progress, and democratic governance by educating public policy professionals, producing policy-related research, and conveying the results to the world. Based in New York City, with a student body that is 50 percent international and educational partners in cities around the world, SIPA is the most global of public policy schools.

For more information, please visit www.sipa.columbia.edu

The Washington Post
Democracy Dies in Darkness

EXCLUSIVE

Russia's state nuclear company aids war effort, leading to calls for sanctions

By Catherine Belton

January 20, 2023 at 2:00 a.m. EST

Russia's state nuclear power conglomerate has been working to supply the Russian arms industry with components, technology and raw materials for missile fuel, documents show, aiding Moscow's deadly onslaught on Ukraine and leading to calls for the company, Rosatom, to be put under sanctions.

A letter from a Rosatom department chief, dated October 2022 and obtained by Ukrainian intelligence, refers to a recent meeting with the Defense Ministry and representatives of Russia's military-industrial complex. It shows the state nuclear company offering to provide goods to Russian military units and to Russian weapons manufacturers that are under sanctions.

The weapons manufacturers include Almaz-Antey, a missile systems producer; NPK Tekhmash, which manufactures unguided bombs and multiple missile launch systems; Vysokotochniye Kompleksy, which makes Iskander missiles; NPO Splav, which produces the Uragan rocket launchers that fire cluster bombs; the state-owned aircraft conglomerate; and several Russian armored carrier and tank makers. Detailed descriptions of the products available for use by the Russian military and the arms industry are attached to the letter, which was provided to The Washington Post.

Rosatom has long presented itself as a civilian entity operating nuclear power plants in commercial partnerships across the globe, despite its role in also developing nuclear weapons for Russia. "Rosatom is known in the nuclear world as a civil nuclear company. That's basically what its brand name is," said Mark Hibbs, senior fellow in the Carnegie Endowment for International Peace's nuclear policy program.

But Russia's war against Ukraine is exposing how closely the company, which has a board stacked with current and former senior officials from Russia's security services, is intertwined with its military-industrial complex — and even Russian military operations in Ukraine.

After Russia invaded Ukraine last year, Rosatom's employees facilitated Moscow's illegal seizure of Ukraine's Zaporizhzhia nuclear power plant, according to Ukrainian officials and a Russian presidential decree. The plant, Europe's largest, was cut off several times from Ukraine's electric power grid, and the military standoff at the facility brought the world "one step away from a nuclear accident," according to International Atomic Energy Agency chief Rafael Mariano Grossi.

Witnesses said Rosatom employees stationed at the plant appeared to have directed some of the Russian artillery targeting the plant, while at the height of the shelling in August, Ukrainian President Volodymyr Zelensky decried the attack as "nuclear blackmail" by Moscow. The Ukrainian government said Russia was intentionally seeking to cut off the plant, which is now in cold shutdown because of the artillery fire, from supplying electricity to Ukraine.

Rosatom said in response to a request for comment that "all the claims in your request are completely untrue."

Previous calls by Ukraine — backed by Lithuania, Estonia, Latvia and Poland — to impose sanctions on Rosatom over its involvement in the seizure of the Zaporizhzhia nuclear power plant have not led to action, but disclosures about its role in aiding Russia's arms industry will now add to pressure to list the company.

"If Rosatom is providing support for the Russian arms industry, that's sanctionable," said Daniel Fried, the State Department's sanctions coordinator until 2017.

The company has so far escaped sanctions, in part amid concerns over the potential economic fallout because of its extensive involvement in the civilian nuclear power industry across the globe, including in Western Europe and the United States. There are 18 Russian-designed nuclear power plants operating in the European Union, "and that means the Russians ... have leverage over the continued operation of most of these facilities," Hibbs said, noting that in Slovakia, Russian-designed plants produce half of the country's electricity. The United States depends on Rosatom for about one-quarter of its enriched uranium supplies.

In addition, Rosatom controls about 30 percent of the global market for uranium enrichment and 17 percent of the market for reactor fuel, and out of the approximately 450 nuclear power plants around the world, about 20 percent of them are Russian-designed, Hibbs said. Rosatom is currently working on 23 nuclear power units across the globe, including in India, Turkey and Egypt, with its foreign order book standing at $200 billion.

An attempt to immediately unwind dependence on Rosatom for nuclear fuel supplies, waste management and other partnership agreements could cause major new energy price volatility at a time when the E.U. is only just emerging from a bruising year of soaring energy costs as it weaned itself off Russian oil and gas.

The Ukrainian government, however, has been ramping up the pressure for sanctions in recent weeks. Zelensky's chief of staff, Andriy Yermak, met the State Department's sanctions coordinator, James O'Brien, on Jan. 12 to discuss Rosatom and "strengthening sanctions against individuals and legal entities that continue to support Russia's aggression against Ukraine."

After talks this month with European Commission Vice President Frans Timmermans, Ukrainian Prime Minister Denys Shmyhal indicated that he expected sanctions on Rosatom to be included in the E.U.'s next package of sanctions against Russia, saying that Moscow "must be punished for attacks on Ukraine's energy industry."

Ukrainian Foreign Minister Dmytro Kuleba said revelations over Rosatom's involvement in supplying the Russian arms industry "ring the alarm bell even more and prove that the problem is larger than previously known."

In a statement to The Post, Kuleba said: "Nuclear cooperation with today's Russia is not only immoral because it sponsors Russia's war crimes in Ukraine, but also dangerous. ... We call on all states to halt any nuclear cooperation with Russia, avoid getting into any new joint projects with Russia in this field, and impose personal sanctions on the key Rosatom officials and employees who had interfered with Ukraine's nuclear system." Kuleba said imposing personal sanctions is "an absolute bare minimum."

Among the materials Rosatom's subsidiaries offered to provide to the Russian defense industry, the documents show, are aluminum oxide, a vital component for missile fuel. Other goods include lithium-ion batteries to power tanks, missile defense systems and other armaments; 3D-printing technology; and chemical compounds used in aircraft and missile engineering, the documents show.

It's not clear which — if any — of these products were supplied to the Russian arms industry. But in an address to Rosatom on its 15th anniversary in December, Russian President Vladimir Putin praised the nuclear company for its "huge contribution ... to developing advanced weapons systems and military hardware and putting them on combat duty."

Pavel Luzin, an independent Russian military analyst, told The Post that Rosatom had developed a long-term strategy to supply the Russian arms industry. The Russian Defense Ministry has also spoken, in official statements, of long-running cooperation on "nonnuclear" weapons with the state nuclear conglomerate.

Customs data provided to The Post by the Washington office of the James Martin Center for Nonproliferation Studies shows that at least one Rosatom subsidiary, Renera, has imported at least $1 million worth of lithium-ion battery components from South Korea since the war in Ukraine began.

Experts said they feared Russia could be using Rosatom's current non-sanctioned status as a way to obtain components that would otherwise be embargoed. "It's a big potential loophole," said Jacob Nell, former chief Russia economist for Morgan Stanley and now a member of an independent group of international experts working with the Ukrainian presidential administration on sanctions against Russia. "Specialized imports are being sourced through the nuclear sphere."

Ukrainian officials say Rosatom's involvement at the Zaporizhzhia plant is reason enough to sanction the company. Groups of about a dozen Rosatom employees, accompanied by a contingent of officers from Russia's Federal Security Service (FSB) and hundreds of armed Russian troops, have been present at the plant since mid-March, soon after the Russian army seized control of it.

Rosatom has sought to shield itself from possible sanctions by insisting that its employees were present only to provide technical advice for the safety of the plant. In August, Rosatom said its staff played no role in the plant's management or defense.

But Rosatom has since officially taken operational control of the plant after Putin unilaterally signed a decree on Oct. 5 transferring the Zaporizhzhia facility to Russian federal property in the wake of Moscow's illegal annexation of the region. The decree handed the use of its "financial, material and other resources" to a new operating company owned by a Rosatom subsidiary, "to ensure the safety of nuclear facilities, radiation sources, storage facilities for nuclear materials and radioactive substances, and radioactive waste storage facilities."

A key Rosatom employee present at the plant since late March, Oleg Romanenko, was appointed general director of the plant's new operating company two days before Putin issued the decree, company registration documents show. The plant's Ukrainian chief engineer was appointed general director of the power station itself. In response to the request for comment, Rosatom said the transfer to the new operating company was aimed at "ensuring the safe and reliable operations of the plant."

"Ensuring nuclear safety and security of nuclear facilities and installations is Rosatom's number one priority," the company said.

One eyewitness, Oleh Dudar, a former head of operations for the Zaporizhzhia plant's nuclear reactor and turbine unit, however, told The Post that Rosatom employees, although initially in the background, increasingly took control over the summer, at first issuing demands to inspect the plant's systems, including its electricity circuits. "The longer time went on, the more they began dictating to us," said Dudar, who has since fled to safety in Western Europe.

Dudar said he believed Rosatom employees, under the direction of Romanenko, had helped direct Russian artillery fire targeting parts of the facility and its territory, including its transmission lines, to cut it off from supplying the Ukrainian electrical grid while blaming Ukraine for the fire. "They were studying the electricity circuits, the transmission lines, our equipment and the communication systems. They were studying them closely over a week," Dudar said. "And then the next week, the objects they'd been studying were shot at and the equipment went offline. It seems to me they were looking. I had the impression that they directed and managed this."

There are also questions about whether Rosatom staff may have been involved in the summary detentions of hundreds of the plant's Ukrainian workers, who, according to Dudar and other witness accounts described by Ukrainian officials, were held for weeks in cellars and tortured by FSB officers, sometimes with electricity. The detentions first occurred over the plant workers' pro-Ukrainian sentiments, but increasingly they were used as a mechanism to force workers to sign contracts to work for Rosatom, according to Dudar.

Kuleba said that Ukraine has moved away from dependence on Russian fuel supplies for its nuclear industry and that other countries should follow suit. In recent years, he noted, Ukraine switched to alternative supplies from Westinghouse, an American company, which developed the capability to replicate Russian-made fuel supplies so it could service Soviet-era plants.

There are signs that the war is beginning to affect Rosatom's bottom line. Bulgaria in the past month signed two supply deals, first with Westinghouse and then with France's Framatome, to replace the Russian fuel its nuclear power plant currently relies on. Last year, Finland walked away from a multibillion-dollar project with Rosatom to build the Hanhikivi-1 nuclear plant, which would have generated 10 percent of Finland's electricity needs.

An international working group on Russian sanctions working with Yermak, the Ukrainian presidential chief of staff, has proposed a gradual process that would first focus on personal sanctions and barring supplies of raw uranium from Russia, where Moscow has only about 5 percent of the global market, while preparing the ground for a longer-term shift from dependency on Rosatom.

"Serious moves to reduce the West's critical dependency on Rosatom across the nuclear fuel cycle are more important over time," Nell said.

ENERGYWIRE

Ukraine war to accelerate shift away from fossil fuels — BP

The oil major's new energy outlook says countries will turn more quickly to domestic renewables as they look to increase their energy security.

BY: **CARLOS ANCHONDO** | 01/31/2023 06:58 AM EST

A liquefied natural gas tanker.| Steve Campbell/AP Photo, Houston Chronicle

ENERGYWIRE | Russia's invasion of Ukraine could speed up the global transition away from oil and natural gas, according to BP PLC's annual energy outlook.

The report, released Monday by the oil and gas major, says that countries could shift to domestic renewables, prompted by energy security concerns as the war continues with "no end in sight."

"The increased importance placed on energy security as a result of the Russia-Ukraine war leads over time to a shift away from imported fossil fuels towards locally produced non-fossil fuels, accelerating the energy transition," company analysts wrote in the outlook.

That could be particularly true for China, India and the European Union, the outlook said. All rely heavily on imports for their oil and gas consumption, with any decline offset by a "greater consumption of domestically produced renewables," according to the report.

BP considered three scenarios in the report. Two are broadly in line with keeping warming in 2100 to "well below" 2 degrees Celsius when compared to pre-industrial levels, as outlined in the Paris Agreement. A third, called "New Momentum," looks at the current trajectory of the global energy system.

The company found that the latter scenario has changed significantly since its outlook last year, which was released before Russia's invasion of Ukraine. Oil demand in 2035 would be 5 percent lower — and gas demand 6 percent lower — than the 2022 outlook predicted.

The events of the past year "show how relatively small disruptions to energy supplies can lead to severe economic and social costs, highlighting the importance that the transition away from hydrocarbons is orderly, such that the demand for hydrocarbons falls in line with available supplies," said Spencer Dale, BP's chief economist, in a statement released with the outlook.

BP says oil will continue to play a "major role" in the global energy system over the next 15 to 20 years. But its report also emphasizes that the "carbon budget is running out."

"Despite the marked increase in government ambitions, CO_2 emissions have increased every year since the Paris COP in 2015 (bar 2020)," the company wrote in a section titled "Core Beliefs." "The longer the delay in taking decisive action to reduce emissions on a sustained basis, the greater are the likely resulting economic and social costs."

The outlook's new momentum scenario has carbon dioxide emissions peaking in the 2020s and dropping by around 30 percent from 2019 levels by 2050. All scenarios assume the use of carbon capture, utilization and storage.

The outlook also looks at the future of liquefied natural gas, finding that the war in Ukraine has "scarred" the prospects for Russian exports.

A growth in global LNG demand out to 2030 is thus met by "a substantial expansion of exports from the US and Qatar," according to the report. It finds that by 2030, the U.S. and the Middle East could together produce about half of global LNG supplies, up from around a third in 2019.

Energy Justice and Climate Change: Key Concepts for Public Health

APHA
AMERICAN PUBLIC HEALTH ASSOCIATION
For science. For action. For health.

Climate change is a threat multiplier.

Climate change exacerbates health inequities, disproportionately harming the most vulnerable among us. That includes children and pregnant women, people with low income, the aged and people with disabilities and chronic illnesses, some communities of color, indigenous people and tribal communities, immigrants, marginalized people of all races and ethnicities and outdoor workers, to name a few.

Difficulty in accessing the political, economic, social and environmental resources that enable people to cope with climate threats, such as extreme heat and natural disasters, can contribute to a potentially unmanageable energy burden as climate change worsens.

U.S. communities that lack accessible, affordable household energy services often have poorer health, fewer educational and economic opportunities, limited political representation and inadequate access to health care. As climate change worsens, alternative energies, such as solar or wind are becoming competitive at similar, or even lower, prices than fossil fuels like coal and natural gas.

Alongside community leaders, public health professionals have a role to play in monitoring, evaluating and supporting this transition to a healthier energy supply. A thoughtful energy transition provides opportunities for mitigating climate change and promoting health equity at the same time.

How do structural racism and climate change contribute to energy burden?

In the same way that climate change disproportionately affects certain populations, energy is a health equity issue. For over 60 years, the environmental justice movement has raised awareness that people of color and low-income communities often bear the brunt of "brown" environmental issues. Meanwhile, white and more affluent communities enjoy the benefits of "green" environmental benefits.

In the context of energy, race – even more than class, is the number one indicator for the placement of toxic facilities in this country. Housing in general is one of the best known and most well-documented social determinants of health. The affordability, location and quality of housing all have been independently linked to health. It is important to acknowledge the effect that historical practices of redlining and discriminatory mortgage lending have had on our nation.

Spotlight: Heat islands

Poor-quality housing and blighted neighborhoods diminish property values, increase crime and erode the cohesiveness and political power of communities. As a result, many people of color and low-income communities in urban areas lack the infrastructure investment for things like green spaces that are critical to cooling urban heat islands.

These neighborhoods get much hotter on average than other areas, negatively impacting the health of residents and increasing energy usage. Residents who rent their property lack the long-term incentive to invest in costly air conditioning units for a short-term residence. And with the exception of Dallas and Phoenix, there is no law requiring landlords to provide air conditioning the way they must provide heat. This places renters at higher risk.

Through ongoing racial discrimination and worsening climate change, communities of color face increasingly impossible trade-offs when managing the cost of their undue energy burden and other household needs.

Key concepts

ENERGY INSECURITY *An inability to adequately meet basic household energy needs, such as gas, appliances, plumbing, heating, cooling.* In 2015, 31% of U.S. households reported struggling to pay energy bills or to maintain adequate heating and cooling in their homes. About one in five households reported reducing or forgoing basic necessities like food and medicine to pay an energy bill. Eleven percent of households reported keeping their home at an unhealthy or unsafe temperature due to costs.

> CASE STUDY The U.S. Low Income Home Energy Assistance Program assists eligible low-income households with their heating and cooling energy costs and provides bill payment assistance, energy crisis assistance, weatherization and energy-related home repairs. For more information: **www.benefits.gov/benefit/623**

ENERGY BURDEN *The proportion of a household's monthly income that is spent on home energy costs.* Low-income households often face an energy burden that is three times higher than other households.

> CASE STUDY The Kentucky Utilities WeCare program stands for Weatherization, Conservation Advice and Recycling Energy. The program assists with home weatherization for low-income populations, leading to a decreased energy burden through increased energy efficiency. For more information: **www.lge-ku.com/wecare**

ENERGY EQUITY *Fair distribution of benefits and burdens from energy production and consumption.* Energy equity requires equitable distribution of risks and hazards, as well as available and affordable energy sources. While unfamiliar to many residents, equity-centered energy and utility policies significantly enhance household economic stability and improve the overall quality of air, water and other natural resources that affect our health and well-being. Working directly with communities to build their capacity around energy planning and decisionmaking is key to advancing equity.

> CASE STUDY Partnership for Southern Equity's Just Energy Circle and Just Energy Academy works to eliminate energy insecurity by advancing policies and institutional actions that promote racial equity and shared prosperity for all in the growth of metropolitan Atlanta and the American South. For more information: **www.sites.google.com/view/pse-just-energy-circle** and **www.justenergyacademy.org**

ENERGY JUSTICE *The principle that all people should have a reliable, safe and affordable source of energy; protection from a disproportionate share of costs or negative impacts or externalities associated with building, operating and maintaining electric power generation, transmission and distribution systems; and equitable distribution of and access to benefits from such systems. A global energy system that 1) fairly disseminates the costs and benefits of energy services and 2) contributes to more representative and impartial energy decisionmaking.*

> CASE STUDY The Energy Democracy Project and the Initiative for Energy Justice develop resources to build collective power and advance the movement to democratize energy by providing law and policy resources to advocates and policymakers. For more information: **www.energydemocracy.us** and **www.iejusa.org**

ENVIRONMENTAL JUSTICE *All people and communities have the right to equal environmental protection under the law, and the right to live, work and play in communities that are safe, healthy and free of life-threatening conditions.* Environmental justice is often associated with environmental racism, in which, whether by conscious design or institutional neglect, actions and decisions result in the disproportionate exposure of people of color to environmental hazards and environmental health burdens.

> **CASE STUDY** WE ACT for Environmental Justice in New York City builds healthy communities by ensuring that people of color and low-income residents participate meaningfully in the creation of sound and fair environmental health and protection policies and practices through member participation in education, policy, advocacy, research and more. For more information: **www.weact.org**

JUST TRANSITION *A set of principles and practices focused on changing the energy industry from fossil fuels to alternative energy sources, which ensures workers' rights and offers economic opportunities for affected communities.* This cultural, as well as economic, shift emphasizes sustainability in the face of climate change.

> **CASE STUDY** Coalfield Development trains former coal industry workers in Appalachia for jobs in sectors such as solar energy, sustainable construction and mine-land reclamation. For more information: **www.coalfield-development.org**

HEAT EQUITY *The development of policies and practices that mitigate heat islands and help people adapt to the impacts of extreme heat in a way that reduces the inequitable distribution of risks across different populations within the same urban area.*

> **CASE STUDY** In Dallas, the National Center for Healthy Housing worked together with the Health and Wellness Alliance for Children to update the "Minimum Urban Rehabilitation Standards" of the Dallas City Code Housing Ordinance, requiring landlords to provide air conditioning in all residences of Dallas the same way heat is currently required. For more information: **www.nphw.org/nphw-2020/-/media/files/pdf/topics/environment/built_environment/housing_ordinance_dallas.ashx**

Note: Key concept definitions were courtesy of a variety of sources. For references, please email **climatechange@apha.org**.

Improving Equity Outcomes for New Federal Investments in Clean Energy Infrastructure

The Infrastructure Investment and Jobs Act (IIJA), which passed Congress in 2021 with bipartisan support, makes a historic and necessary $1.2 trillion investment in modernizing America's infrastructure. Of that total investment, nearly $400 billion will be directed to clean energy infrastructure including initiatives for transportation, power and grid systems, technology demonstration programs, modernized permitting, and climate resilience. The American Association of Blacks in Energy (AABE) and the Bipartisan Policy Center (BPC) are working together to explore the opportunities and challenges inherent in these new federal investments.

Public investment has a poor record of keeping pace with infrastructure needs, and infrastructure disparities persist for many disadvantaged Americans, including low-income, rural, Black, Latino, Asian, and Indigenous communities. AABE and BPC believe that the IIJA, if implemented carefully and effectively, offers a once-in-a-generation opportunity to create jobs, accelerate the clean energy transition, and grow the U.S. economy in ways that are both sustainable and equitable.

Our organizations convened a series of conversations with environmental justice advocates, government officials, and business and industry leaders to discuss options for ensuring that IIJA investments create direct value and economic opportunity in underserved communities, support the build-out of an inclusive clean energy workforce, and address the negative effects of past infrastructure decisions. Building on these discussions, AABE and BPC identified three categories of clean energy investment—**foundational investments, remedial investments, and resilience investments**—that can support more equitable outcomes for communities in distinct and important ways. By addressing communities' investment needs in each of these categories, federal officials, private sector executives, and state and local leaders can help ensure that IIJA-funded projects improve equity outcomes.

1. Foundational Investments: Targeting areas of historic underinvestment with the aim of modernizing energy infrastructure and supporting communities' full economic participation and well-being.

In many historically underserved communities, a basic level of energy and technology infrastructure and service either doesn't exist, isn't affordable, or isn't accessible to a large portion of residents. For example:

- Black, Latino, Indigenous, and low-income households pay two to three times more for energy than the national average as a share of their monthly income.[1]
- Over 24 million Americans, 80% of which live in rural and Tribal communities, lack access to fixed broadband services at threshold speeds.[1]
- Rural, low-income, Island, and Indigenous communities pay some of the highest costs for electricity and heating fuel in the country. At the same time, many of these households face geographic, financial, and access barriers that limit their ability to use clean energy technologies, like rooftop solar or efficiency improvements to reduce their energy bills.[2]

Foundational infrastructure investments at both the system and household level are needed to alleviate energy burdens and equalize clean-energy-related economic opportunities. Examples of system improvements include expanding electricity transmission and distribution infrastructure and bringing high-speed internet to rural and other underserved areas to support advanced energy technologies. Foundational investments for low-income households and multi-family buildings may include the improvement to housing quality and the installation of new behind-the-meter water, gas, and electrical equipment to support energy-efficiency, expand clean-energy access, and create positive economic and health outcomes.

A CLOSER LOOK:
Expanding access to high-speed internet in rural communities can deliver economic and climate benefits.

The IIJA makes a historic investment of $65 billion in high-speed internet infrastructure. Funds will go toward making connectivity affordable and expanding broadband access in rural, Tribal, and underserved communities. Access to high-speed internet facilitates digital energy efficiency, more weather-resilient electric systems, increased reliability, and lower energy costs. It also supports precision land management strategies that use web-enabled measurement and data analytics to improve and optimize the performance of agriculture and forestry producers. These practices can reduce fertilizer use and lower production costs while abating emissions and improving water quality. It has been estimated that expanding broadband access in underserved communities could reduce residential electricity bills by as much as 20% while creating \$47–\$65 billion in annual economic benefits. Read more.

2. Remedial Investments: Aiming to correct for or eliminate existing infrastructure deficiencies resulting from neglect, harm, or obsolescence.

Low-income, rural communities, and communities of color disproportionately contend with the economic, health, and environmental impact from the inadequate or polluting legacy of energy infrastructure, leaving them underprepared for the clean energy transition. Remedial investments can address these burdens and remove barriers to access new clean infrastructure. For example:

- Black Americans are more likely than others to be exposed to harmful air pollutants from electricity generation, especially by "peaker" power plants.[2] Such plants run infrequently, typically during periods of high (or peak) electricity demand and are generally less efficient and more polluting than other power plants. Energy storage facilities (e.g., battery storage systems or solar-plus-storage projects) are being proposed and built in some regions to replace peaker plants and meet peak electricity demand while minimizing local air pollution impacts.[3]
- Most climate-change mitigation strategies call for the widespread adoption of clean distributed energy resources (DERs) such as household solar panels and battery storage. Yet local infrastructure that is in disrepair or has not been upgraded can be a barrier to siting DERs or interconnecting new residential solar projects. Local electric grid capacity limits have been found to limit low-income, Black, and Asian households' access to DERs in California.[4] Investments to expand DER hosting capacity in underserved communities can enable more equitable participation in and benefit from clean energy.

Remedial projects include both front-end and back-end investments. On the front end, assessments of the state of current infrastructure systems (e.g., electric, water, transportation) and impact on the well-being of vulnerable communities will be needed, together with determinations about the readiness of these systems for 21st century upgrades. On the back end, long-term mechanisms to fund the operation and maintenance of new infrastructure are needed to prevent future deficiencies.

A CLOSER LOOK:

Targeted redevelopment with clean energy can address local legacy pollution and reduce carbon emissions.

The IIJA provides $1.5 billion in grants, technical assistance, cooperative agreements, and direct support to states and local and Tribal governments to repair brownfield sites and enable environmental and economic revitalization. The Environmental Protection Agency (EPA) is reviewing a series of broad policy actions to protect communities near industrial sites with water and air quality issues.[5] For example, one EPA initiative, called RE-Powering America's Land, encourages renewable energy development on current or formerly contaminated lands, landfills, and mine sites. When consistent with the host community's vision for future development, clean energy projects on underutilized sites like landfills and brownfields can provide significant economic recovery opportunities. In many cases, these sites already possess existing transmission, distribution, transportation, and other support infrastructure that can be leveraged for renewable energy development, reducing project installed costs by $45–$113 per kilowatt of generating capacity.[6] EPA has identified more than 130,000 sites across the country that are potentially suitable for solar, wind, biomass and geothermal energy development. For example, the developer of a 3.3-megawatt solar project on a former auto salvage yard in Vermont was able to remediate the land beneath the solar arrays with pollinator-friendly ground cover; meanwhile land lease payments made it possible for the site's owners to stay on land that had been in the family for generations. Read More.

3. Resilience Investments: Improving energy infrastructure so that communities can better withstand the impacts of extreme weather and climate-induced hazards.

Economic and infrastructure disparities make low-income communities, rural communities, and communities of color more vulnerable to extreme weather events and other adverse effects of a changing climate. For example:

- Hispanic and Latino individuals are 43% more likely to live in areas with high labor losses due to high-temperature events, impacting both their economic and health outcomes.[7] Island and Tribal communities are more likely to live in areas at the highest risk of sea level rise, endangering the survival of their communities.[7]

- Climate change exacerbates the deficiencies of aging critical infrastructure (e.g., water and sewage systems, roads, bridges, and power plants), and increases exposure to damage or loss from extreme weather. Low-income, Black, and Latino populations in particular experience disproportionate hardships from infrastructure service disruptions.[8]
- Underinvested, low-quality, poorly maintained, or high-density housing infrastructure can make communities more vulnerable to the adverse impacts of climate-change-induced extreme weather events, including storms and extreme heat, and indoor air quality problems.[8]

Resilience investments represent an opportunity to deploy clean-energy and energy-efficiency technologies not only for their climate mitigation and economic benefits, but also to bolster the ability of historically underserved communities to withstand and recover from climate-change impacts. Examples of community-led resilience projects include making climate-smart upgrades to local critical infrastructure, installing microgrids with distributed generation or energy storage to provide electricity during disasters, and weatherizing homes to increase protection from extreme weather and use less energy.

A CLOSER LOOK:
Remote, Island, and Tribal communities can enhance their energy resilience using new building and grid technologies.

The Department of Energy's National Labs have launched several programs to build climate resiliency in local communities. These programs are being undertaken in partnership with residents and regional organizations.

- The National Renewable Energy Laboratory's Energy Transitions Initiative Partnership Project supports remote and Island communities with tailored, community-driven approaches for transitioning to clean and resilient energy systems.
- Pacific Northwest National Laboratory and Sandia National Laboratory are working jointly on the Energy Storage for Social Equity Initiative, which helps urban, rural and Tribal communities assess and plan for energy storage projects.

- A team of national labs is supporting Puerto Rico's Grid Resilience and Transition to 100% Renewable Energy study (PR100). The study will assess prospects for deploying renewable energy and other technologies for energy storage, distributed generation, distribution control, electric vehicles, and energy efficient and responsive loads.
- The National Renewable Energy Laboratory's Cold Climate Housing Research Center is co-developing and deploying 20 culturally responsive, high-performance buildings in Alaska that incorporate resilience to severe climate impacts and local energy generation.

Endnotes

1 World Resources Institute. 2021. *Addressing Energy Equity in the United States: Policy considerations for federal investments*. https://www.wri.org/research/energy-equity-united-states-federal-investment.

2 Krieger, E. M., Casey, J. A., & Shonkoff, S. B. (2016). A framework for siting and dispatch of emerging energy resources to realize environmental and health benefits: Case study on peaker power plant displacement. *Energy Policy, 96*, 302-313.

3 Pacific Northwest National Lab. (2021). Energy Storage for Social Equity: Capturing Benefits from Power Plant Decommissioning.

4 Brockway et al. Nature Energy. *Inequitable access to distributed energy resources due to grid infrastructure limits in California*. (2021)

5 Environmental Protection Agency. *EPA Administrator Regan Announces Bold Actions to Protect Communities Following the Journey to Justice Tour*. (January 2022)

6 Environmental Protection Agency. *RE-Powering America's Land Initiative Discussion Paper The Value of Existing Infrastructure for Renewable Energy Development* (2020).

7 Environmental Protection Agency. *Climate Change and Social Vulnerability in the United States*. (Sep. 2021).

8 USGCRP, 2016: The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska, Eds. U.S. Global Change Research Program, Washington, DC, 312 pp. http://dx.doi.org/10.7930/J0R49NQX

E&E NEWS

China invests $546B in clean energy, far surpassing U.S.

By Sara Schonhardt

01/30/2023 06:47 AM EST

China once again topped the world in clean energy investments last year, a trend that could challenge U.S. efforts to develop more homegrown manufacturing.

Nearly half of the world's low-carbon spending took place in China, according to a recent analysis from market research firm BloombergNEF. The country spent $546 billion in 2022 on investments that included solar and wind energy, electric vehicles and batteries.

That is nearly four times the amount of U.S. investments, which totaled $141 billion. The European Union was second to China with $180 billion in clean energy investments.

China also dominated in low-carbon manufacturing, accounting for more than 90 percent of the $79 billion invested in that sector last year, according to the report.

The findings come as the U.S. and Europe work to expand domestic manufacturing capacity. The United States has begun in recent months to roll out the benefits of the Inflation Reduction Act, which is packed with $369 billion of incentives aimed at building up the U.S. clean energy industry.

But competing with China's networks won't be easy.

"China has managed to nurture these really integrated, efficient value chains for making things like solar panels, for making things like battery cells," said Antoine Vagneur-Jones, head of trade and supply chains research at BloombergNEF.

Both now make up a substantial percentage of China's export revenues, he added. But China is also investing heavily in domestic supply chains, including wind turbine components for a massive expansion in offshore wind deployment, Vagneur-Jones said.

The Inflation Reduction Act aims to counter China's dominance by offering billions of dollars in subsidies to domestic manufacturing. One major provision, for example, will offer consumers thousands of dollars in tax credits when purchasing an electric vehicle — but only when the bulk of battery components are made or assembled in North America.

Those incentives have generated strong international criticism, particularly from the European Union. But President Joe Biden has been clear what he's aiming for, saying in a speech last week that "the supply chains are going to start here" (*Climatewire*, Jan. 27).

BloombergNEF's figures don't account for the dozens of planned U.S. factories announced in recent months. But while Inflation Reduction Act incentives will start to make a dent in China's share of manufacturing, Vagneur-Jones said, it will happen gradually.

"Even in a sort of, say, optimistic scenario, I think China's still going to remain dominant for the next decade or more. But it could mean that we see sort of these parallel supply chains develop," he said.

Take battery cell manufacturing. It's expected to increase sixfold by 2030, but China's share of the market is projected to decline to just 70 percent from 79 percent today, BloombergNEF research shows.

That's partly because China plans to expand its battery manufacturing capacity, even as supply chains get built up elsewhere. There are also barriers to ramping up clean energy manufacturing in the United States, including higher costs and the challenges of developing a new sector from scratch.

The task could be even more difficult if tensions between China and the U.S. increase, curtailing the ability of U.S. companies to access Chinese expertise on clean energy development, Vagneur-Jones said.

"The offshoot is not just that production will be more expensive in places like the U.S., which it would be, but also that it might be very difficult to really scale things up fast, because of the fact that you can't tap into that Chinese expertise," he said.

There are risks to having supply chains so heavily concentrated in one geographical area. Geopolitical tensions can more easily disrupt trade, as can the impacts of climate change. For example, a major heat wave led to power shortages last August in a Chinese province that supplies a significant amount of the world's solar panels and components — leading to a price increase for those goods.

The next few years will be decisive, Vagneur-Jones said. The United States, Europe, India and Indonesia are all ramping up their domestic manufacturing efforts. The question is whether those plans bear fruit.

"We could see a turning point for this trend that we've seen, which has been China's dominance in not just the existing capacity that's been built, but also ongoing investments," he said.

The Honorable Paul Dabbar
CEO, Bohr Quantum Technology
Former Under Secretary, U.S. Department oi
52 Secor Road
Scarsdale, NY 10583

Kaitlyn Peterson
Legislative Clerk
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, D.C. 20515

Dear Ms. Peterson:

Thank you for allowing me to appear before the Committee on Energy and Commerce on Tuesday, January 31, 2023, to testify at the hearing entitled "American Energy Expansion: Strengthening Economic, Environmental, and National Security."

Pursuant to the Rules of the Committee on Energy and Commerce, I have been asked to answer additional questions for the record. The questions you sent to me, and answers, are attached. As requested, the format of my responses to these questions are as follows: (1) the name of the Member whose question I am addressing, (2) the complete text of the question I am addressing in bold, and (3) my answer to that question in plain text.

Paul Dabbar

Paul Dabbar

Attachment-Additional Questions for the Record

The Honorable Michael Burgess, M.D.

1. **Mr. Dabbar, Texas' population has grown exponentially over the previous decade. With that large increase in population, our grid suffers under tremendous strain because of the lack of investment in baseload power generation. Regrettably, it seems that too much emphasis has been placed on the expansion of renewable capacity. Mr. Dabbar, in your opinion, what role can Congress play in creating a resilient and diverse baseload generation ecosystem?**

   The Independent System Operators ("ISO"), including ERCOT, the Texas ISO, have not implemented rules to maintain base load generation as intermittent renewables have been added to the systems. Congress should look to reform the Federal Power Act to direct all systems, including the intra-state ERCOT system, to better support base load generation, especially as intermittent renewables are added. There are various ideas on how to word that requirement. One idea is mandating the ISOs to better model the instability that renewables are adding to the grid, and properly estimate the increasing needs of dispatchable generation as a result. And to formalize contracting or compensation systems for that dispatchable power to ensure that it gets built.

2. **In your testimony, you discuss reforming certain regulations regarding our nations electrical grid, specifically, reforming regulations concerning Independent System Operators (ISO) that would encourage more baseload generation capacity to be built. Can you speak to those reforms?**

   The ISO's and FERC are mismanaging the supply needs of power sector in many regions of the U.S. Leading in many places to more power plants being retired than are being built. And this increasing supply risk is be exasperated by growing power demand from electrification. This is leading to higher outages and increasing prices.

   Given FERC is not currently setting market rules to properly incentivize base load power from being built or maintained, it is imperative that Congress look at FERC reform legislation, including reforming the Natural Gas Act and Federal Power Act

("FPA"). On topics such as strong requirements that natural gas infrastructure get approved, and not disapproved by supposed views on siting that fall outside the intent of Congress, and the West Virginia vs EPA standard. The FPA could be amended to more specifically mandate base load support in ISO rules approved by FERC.

Finally, strong NEPA reform legislation should be looked at by Congress. Including narrowing maximum time frames for reviews. And closing gaps opened by decades of court rulings expanding challenges on the review process.

3. **What are the benefits of expanding America's LNG exports, both domestically and globally?**

   LNG exports domestically have great value to both the U.S. economy, and national security posture.

   Energy exports have a significantly positive impact on the U.S. balance of trade.

   In addition, jobs from natural gas production, processing, transportation, and liquefaction are very numerous, and they jobs are very high paying. And given these jobs are a form of manufacturing jobs in their regions, they tend to spawn many other local jobs in their communities. And jobs from energy production and sales of gas and oil are far more numerous and higher paying than jobs for renewables.

4. **What are the current challenges to expanding the production and export capability of LNG?**

   The largest impediment is siting of transportation of national gas from production regions to the liquefaction sites on the coast. New pipeline siting is near impossible to accomplish today.

The Honorable Richard Hudson

1. **What is the government's role in protecting critical grid infrastructures from all hazards, including physical attacks?**

   Government has several important roles:

   a. National Intelligence monitoring potential attacks. Collecting that through the various Intelligence Community entities, such as NSA, CIA, and through our allied intelligence partners

b. Communicating with grid owners (private, municipal, and federally owned utilities) about attacks. Including having classified channels that allow prompt notification from utilities when they are getting attacked. And for communicating to utilities when the IC identifies an impending attack.
c. Coordinating response to prevent or react to an attack.
d. Provide possible counter-attack efforts, including utilizing cyber-attack capabilities of DOD and IC elements (such as Cyber Command)
e. Helping provide security standards around power equipment manufactured by countries of risk.
f. Helping coordinate recovery from grid or power plant attack incidents.
g. Helping develop new software and hardware technologies that are more resilient.

2. **What technologies or methods have been used to ensure the grid remains resilient to outages and disruptions? How should Congress support the industry as they look for more innovative methods?**

Each utility has their own information security program, as does each of the regional Independent System Operators.

However, cyber security programs between the DOE and the utilities, led by the DOE Cybersecurity, Energy Security and Emergency Response Office, is the most important program for grid security for the country. Note, this is a Senate confirmed assistant secretary position, but the administration has decided to not nominate an assistant secretary.

I would note that the electric system cyber response coordinated by DOE is much better developed than pipeline security programs, which is split between the Transportation Department and DOE. And there is much less coordination and partnership between the federal government and the pipeline industry. As a result, the risks to natural gas, oil, and oil products transmission are less addressed.

The in addition to the cybersecurity efforts described in #1 above, the same office at DOE is tasked with helping coordinate emergency response support when storms or other natural disasters effect the grid, in conjunction with the Edison Electric Institute and other trade associations. In general, power industry emergency response performs well across the U.S.

3. **In a piece for the Hill this past spring, you said the U.S. can concurrently increase energy availability, reduce costs and reduce emissions. As the Energy and Commerce Committee continues to look for legislative solutions that do all three, what are some the most cost- effective investments we should be looking to make?**

   Investment in innovation for new energy technologies is the most impactful and cost-effective investment that can be made by the federal system. The U.S. leads the world by far in innovation for new energy technologies. And those past investments have made significant impacts to concurrently increase energy availability, reduce costs and reduce emissions. Examples of American energy innovation that accomplished that include nuclear power, solar PV, lithium ion battery chemistry, material gas turbine improvements, 3-D seismic imaging, directional drilling and hydraulic fracturing.

   While the last Congress focused on increasing support for deployment of already proven technologies, the private sector has significant resources and more experience for those efforts. But the private sector under invests in early stage innovation. The best place for the taxpayer to invest is where the private sector will never be focused, and that is in early stage innovation and discovery.

The Honorable Greg Pence

As NERC and MISO continue raising the alarm of a reliability crisis facing our electric grid, the Biden Administration is charging forward with actions to drive out baseload generating supplies. I am concerned that the forced transition to electrification will compound these issues and upend an energy system that has taken over a century to build. Meanwhile, energy demands across the country are expected to continue outpacing energy supplies during times of high demand. For Hoosiers in Southern Indiana, that means less reliable access to energy at a higher price.

1. **Do you agree that the overreliance of intermittent energy sources at**

the expense of baseload generating units are deteriorating the reliability of our electric grid?

Yes I agree. It is an undisputable fact from a system engineering analysis that replacing dispatchable and far more available power supply (such as from gas, coal, and nuclear plants), and replacing it with far less available and dispatchable power supply (such as wind and solar) reduces reliability. One can debate by how much in any particular situation, but is a clear fact it reduces reliability, and any debate needs to start from that systems engineering fact. While wind and solar have definite advantages on marginal cost and emissions, they have several engineering, power density, and other downsides compared to other types of generation.

And while lithium-ion batteries have certain performance and cost effective deployment options for localized grid deployment, at $1.2 million per MW for only four hours of supply at rated capacity, it is far too expensive for large scale, longer term back up.

As renewables increase their penetration in markets, it is therefore important to increase dispatchable power from power plants such as nuclear and gas, or in certain geographies geothermal and hydroelectric could be added. Or we need to develop cheaper and better performing new technologies, such as new battery chemistries, or fusion.

2. **What sort of actions can Congress take to ensure that grid reliability is prioritized when considering electricity market decisions at the ISO/RTO level?**

The ISO's and FERC are mismanaging the supply needs of power sector in many regions of the U.S. Leading in many places to more power plants being retired than are being built. And this increasing supply risk is be exasperated by growing power demand from electrification. This is leading to higher outages and increasing prices.

Given FERC is not currently setting market rules to properly incentivize base load power from being built or maintained, it is imperative that Congress look at FERC reform legislation, including reforming the Natural Gas Act and Federal Power Act

("FPA"). On topics such as strong requirements that natural gas infrastructure get approved, and not disapproved by supposed views on siting that fall outside the intent of Congress, and the West Virginia vs EPA standard. The FPA could be amended to more specifically mandate base load support in ISO rules approved by FERC.

Finally, strong NEPA reform legislation should be looked at by Congress. Including narrowing maximum time frames for reviews. And closing gaps opened by decades of court rulings expanding challenges on the review process.

Indiana has a long, storied history in energy intensive industries like steel and manufacturing. Across Indiana's Sixth District, companies are taking advantage of the expertise of Hoosier innovators to bring back domestic industries and secure global supply chains. However, these entities will need access to reliable, affordable energy supplies like natural gas to stay competitive.

1. **How are actions by the Biden Administration to inhibit adequate energy distribution impacting manufacturing and industrial sectors?**

   Manufacturing facilities many times must use coal or natural gas for their processes vs using electricity. They might be able to use hydrogen in the future, but for many facilities there are no alternatives for foreseeable future.

   As a result, as coal is being utilized less because of emissions concerns, the demand for natural gas for manufacturing is going up. And as more manufacturing is being built in the U.S., this adds additional demand for natural gas. In addition, as coal fired power plants are being retired, with more dispatchable & base load replacement generation needed that is primarily using natural gas, that puts even more pressure on natural gas transmission that can affect natural gas availability for manufacturing.

   Given FERC, EPA and other government agencies are restricting new pipelines that are needed for manufacturing increasingly, this is effecting manufacturing several ways:

- Costs for currently installed manufacturing using this type of energy is going up. As more users increasingly compete to use the same pipelines.
- Areas of the country that need new natural gas infrastructure for new manufacturing facilities are less likely to get new manufacturing sited in their region.
- Areas of the country with existing extensive natural gas infrastructure, or have accelerated intra-state-only needed regulatory approvals for that infrastructure, have an advantage for siting new manufacturing facilities.

2. **Can industries such as steel and manufacturing adequately replace their energy needs with wind or solar?**

   Many industrial processes are hard to operate solely with electricity as their energy input. Many need far higher heat input than can be generated by electricity.

   Currently many of those can only use natural gas or coal for their processes. There are prospects that hydrogen could be a replacement, currently that is not an energy source that has wide availability. In addition, the cost of hydrogen vs natural gas is materially higher. Additional innovation in hydrogen production, transportation and storage will be needed to have it be a viable replacement resources.

The Honorable Russ Fulcher

While geothermal covers a small part of our population today, it offers baseload reliability at utility-level scale according to the Energy Information Administration (the EIA). For example, Idaho's Raft River facility can sell up to 10 MW of this clean, reliable energy source. Yet, permitting for new geothermal projects can take 7-10 years.

1. **My bill, the Enhancing Geothermal Production on Federal Lands Act, would allow for geothermal development where there are already existing oil and gas leases. Can you speak to how changes**

like this that remove duplicative red tape can help America return to energy dominance?

The geology issues that need to be reviewed for oil & gas drill are very similar. Directing agencies reviewing geothermal applications to use already available information, reviews and conclusions from previous oil & gas approvals would be good policy.

2. **I understand that transmission development is one of the key factors that could limit deployment of geothermal technologies across areas of the West, like Idaho. This is largely due to geothermal being located far from load / population centers and the sheer amount of federal land the transmission lines would have to cross in order to meet demand. What barriers exist to developing transmission to help clean, baseload technologies like geothermal to provide reliable power to the grid?**

   In general geothermal transmission access issues are similar to the issues all other types of powers plant have to endure today. The levels of review under NEPA and other siting legislation significantly impede approval processes, and result in many power facilities never being built.

   I would recommend that as you look at potential reforms to the Federal Power Act, that you look at mandating accelerated reviews for baseload power such as geothermal.

Hydroelectric constitutes roughly half of my state's total in-state generation. And, it speaks to the importance of Idaho's dams.

1. **Can you discuss any transmission challenges that may occur with getting this highly reliable and clean energy to population centers, given these dams are often nested between large sections of federal land?**

For the most part, hydroelectric facilities in your state and around the nation were built many decades ago, and as a result the transmission to off-take that power was also adequately built quite a long time ago. However, in many areas of the west, additional wind and solar plants have connected to the grid that have historically been primarily used for those hydroelectric facilities, putting power transmission capacity pressures on those lines. As a result, in those areas, those transmissions lines are under more pressure than in the past. It is therefore incumbent on FERC and ISO's to concurrently authorize expansion of transmission as needed when renewables are added, so as the hydroelectric power does not become restricted. If there are restrictions to added transmission capacity on that federal, state, municipal or private land, that should be taken into account before wind or solar are permitted in that location.

<u>**The Honorable Mariannette Miller-Meeks, M.D.**</u>

Like any engineered system, wind facilities in Iowa and across the country experience some deterioration over the course of their lifetime. For U.S. wind fleets, this degradation involves a step-change in performance after a decade of operation, according to a 2020 study. Unique to the United States, the study shows a significant drop in performance by 3.6% after 10 years. This level of degradation reduces a wind facility's output, increasing the cost of the electricity it produces.

The federal government has supported efforts to reduce turbine degradation. From 2016 to 2022, the ARPA-E program at DOE supported a project led by the University of Virginia to design the world's largest offshore turbine that allows blades to deflect in the wind, much like a palm tree, to withstand hurricane-wind speeds, reducing rotor mass and fatigue.

1. **Are you familiar with the issue of wind turbine degradation; how big of an issue is it; and are you aware of other opportunities or research to maximize wind turbine performance over time?**

   I am familiar that some of the larger wind turbine operators have developed a significant turbine sensing network to real-time identify wearing of their turbines all over the U.S. And they have contributed all that real time data over time to a master artificial intelligence turbine operations and maintenance program that is quite powerful. Those systems have significant value in predicting degradation, and developing maintenance plans far more predictive than direction from the turbine manufactures. That wind turbine degradation data and AI planning has materially improved performance of wind turbines.

As you know, a controlled nuclear fusion reaction at Lawrence Livermore National Laboratory produced more energy than it consumed in December 2022. The milestone, known as "fusion ignition," is unprecedented, according to DOE. Iowa's last nuclear plant shut down in 2020, but from a national standpoint, nuclear fusion would be revolutionary for the United States.

2. **Can you contextualize the recent nuclear fusion breakthrough and how long you believe it will take for the technology to be commercially viable?**

The fusion net-energy generation accomplishment at LLNL was a significant science advancement, and has significant value for the DOE Defense Program stockpile stewardship mission. But facility operational characteristics and net-energy efficiency is still quite distant for a power plant to made with that specific facility design. In addition, the accomplishment shows that the specific design, Inertial Confinement, has prospects.

It does importantly provide visibility on the fusion plasma dynamics for power plants. Currently there are more commercial efforts for fusion power plants in magnetic confinement, and other designs. And this LLNL accomplishment shows that innovation in the fusion sector is making strides, and worth additional support.

As you may know, in 2021, Iowa was the second-largest wind power producer in the country and wind turbines generated 58% of Iowa's electricity, the highest wind power share for any state.
My colleagues and I are clear that we cannot flip the switch overnight to renewable energy, but I believe we can make investments and address policy gaps to support renewable energy technologies as part of the "all of the above" energy mix.

3. **Can you please speak to some of areas Congress needs to engage to help support base load fuels and "complementary technologies" as we continue to integrate renewables into the national energy mix?**

In regards to what Congress needs to look at to support base load fuels: The Independent System Operators ("ISO") have not implemented rules to maintain base load generation as intermittent renewables have been added to the systems. Congress should look to reform the Federal Power Act to direct all systems, including the intra-state ERCOT system, to better support base load generation, especially as intermittent renewables are added. There are various ideas on how to word that requirement. One idea is mandating the ISOs to better model the instability that renewables are adding to the grid, and properly estimate the increasing needs of dispatchable generation as a result. And to formalize contracting or compensation systems for that dispatchable power to that it gets built.

In regard to support of "complimentary technologies", in addition to the above, it is clear that in many places of the country, base load power plants name plate capacity are being retired faster than intermittent power plants are being added. And as a result, there has been a rapid increase in risks and prices in the wholesale power markets. Near term support for available dispatchable power plants at scale for most of the U.S. can only come from natural gas fueled power plants. And given the scale of retirements of coal and nuclear around the U.S., the amount of natural gas plants needed is material, and immediately needed.

Longer term, additional dispatchable might be provided from better battery chemistries than we have today, hydrogen for use in simple cycle or combined cycle turbines, or fusion.

Committee on Energy and Commerce
Tuesday, January 23, 2023, hearing entitled "American Energy Expansion: Strengthening Economic, Environmental, and National Security"

Additional Questions for the Record for Robert McNally
Submitted March 7, 2023

The Honorable Richard Hudson

How can the grid's reliability and security be improved in the short-term and long-term?

I suggest three broad policy strategies to enhance grid security and reliability.

1. Enact permitting reform to enable timely and substantial investments in generation, transmission, and efficiency improvements. Permitting reform is required for all forms of energy resource development, including hydrocarbon, geothermal, and renewable sources. While energy investment decisions are based on various market and industrial factors outside the direct control of Congress, removing unnecessary and debilitating permitting delays is necessary. Permitting reform is especially important for transmission capacity projects due to their long lead times compared to generation projects.

    - NEPA review process alone takes an average of 4.5 years to complete and adds an estimated $4.2 million to project costs.[1] One astute analysis noted "[t]he NEPA process is tailor-made for NIMBYism."[2]

    - A recent Brookings study of renewable permitting delays aptly described the unacceptable situation the US currently faces for both renewable and thermal energy projects: "All told, the dizzying array of permits and other regulatory obstacles to renewable energy projects can create extremely long delays. Reports of 10-year or longer timelines for transmission lines are not uncommon."[3]

    - Reform should include imposing legally enforceable deadlines on federal infrastructure reviews, amending NEPA to disallow steps taken by President Biden's January 2023 CEQ Notice of Interim Guidance, such as including indirect emissions, imposing a social cost of carbon, and omission of cost-benefit analyses. Congress should also reduce litigation risk for project developers, create a unified, centralized permitting process, reduce the scope for state and

[1] https://www.c3solutions.org/policy-paper/nepa-modernization-101/
[2] https://cei.org/wp-content/uploads/2022/09/Mario_Loyola_-_Unleashing_America_s_Energy_Abundance.pdf
[3] https://www.brookings.edu/research/how-does-permitting-for-clean-energy-infrastructure-work/

local regulatory delay and obstruction, and establish programmatic and general permits for major categories of infrastructure projects.[4]

2. Avoid unnecessarily burdensome, excessive, and duplicative regulations and policies that delay or prevent investment in new, efficient generation and transmission capacity.

    - Avoiding mistakes requires the Energy Information Administration to provide Congress with timely and unbiased analyses of the cost-benefit impacts of mandating extreme energy outcomes. For example, the EIA still needs to provide Congress with an analysis of the energy security and economic implications of recent presidential executive orders and legislative climate proposals, including

        - President Biden's executive order calling for the federal government to reduce its emissions by 65% by 2030 and reach net-zero emissions by 2050, and

        - A bill (CLEAN Future Act) introduced by Democrats, mirroring the President's campaign proposal, to ban the use of fossil fuels—which currently account for 60% of U.S. electricity generation—in U.S. power plants by 2035.

    - Transmission capacity expansion is essential for grid reliability. A recent draft DOE analysis concluded that the US likely needs 47,300 GW-miles of new transmission by 2035, a 57% increase compared to today. Significant new transmission capacity is required by 2030 in the Plains, Midwest, and Texas regions. By 2040, sizeable new capacity will be needed for the Mountain West, Mid-Atlantic, and Southeast.[5]

    - Meanwhile, as a February 2023 report, "*Energy Transition in PJM: Resource Retirements, Replacements & Risks*," noted, four trends create increasing reliability risks.

        - Strong electricity demand growth;

        - Thermal (gas, coal primarily) generation retirements due to government and private sector policies, as well as economic factors;

        - Insufficient new generation resources to replace retirements due to industry forces, including siting and supply chain challenges; and

[4] https://cei.org/wp-content/uploads/2022/09/Mario_Loyola_-_Unleashing_America_s_Energy_Abundance.pdf
[5] Howland, Ethan. (2023, March 6). DOE finds 'pressing' transmission needs, with inter-regional links offering the biggest benefits. *Industry Drive, reported in Bloomberg News*.

        - The preponderance of yet still insufficient amount of intermittent (wind, solar) and limited-duration resources at the expense of always-on, long-duration thermal resources.

    - To address these risks, Congress should scrap the current climate strategy and embark on a new one that would depoliticize science, consider the cost-benefit analyses of all strategies, and result in legislative changes at home and leadership abroad. For more background, please see this April 2022 report from the Forum for American Leadership entitled "*Blueprint for a Sound and Serious Climate Policy*."

3. Deter cyber attacks on critical energy infrastructure. Amid reports that our electricity and oil systems are absorbing growing numbers of attacks, Congress must deter cyber attackers. The following May 2021 Forum for American Leadership report entitled "*Eight Necessary Steps to Defend U.S. Critical Energy Infrastructure from Cyber Attacks*" provides more detail.

The Honorable Russ Fulcher

While geothermal covers a small part of our population today, it offers baseload reliability at utility-level scale according to the Energy Information Administration (the EIA). For example, Idaho's Raft River facility can sell up to 10 MW of this clean, reliable energy source. Yet, permitting for new geothermal projects can take 7-10 years.

1. My bill, the Enhancing Geothermal Production on Federal Lands Act, would allow for geothermal development where there are already existing oil and gas leases. Can you speak to how changes like this that remove duplicative red tape can help America return to energy dominance?

Energy investment decisions are based on many market and industrial factors out of Congress's control. But permitting reform is a necessary, but not sufficient, condition for the timely expansion of transmission capacity, which is essential for Idaho's geothermal development and other forms of energy production.

2. I understand that transmission development is one of the key factors that could limit the deployment of geothermal technologies across areas of the West, like Idaho. This is largely due to geothermal being located far from load/population centers and the sheer amount of federal land the transmission lines would have to cross in order to meet demand. What barriers exist to developing transmission to help clean, baseload technologies like geothermal to provide reliable power to the grid?

While I am not an expert in Idaho's geothermal and hydroelectric electricity sectors, unnecessary regulatory delays in transmission siting, permitting, and construction impede connecting electric power generation with demand centers. Therefore, permitting reform is essential, as noted above and in my testimony.

Hydroelectric constitutes roughly half of my state's total in-state generation. And, it speaks to the importance of Idaho's dams.

1. Can you discuss any transmission challenges that may occur with getting this highly reliable and clean energy to population centers, given these dams are often nested between large sections of federal land?

While siting electricity lines is inherently uncertain and involves complex economic, social, and land-use factors, the federal government can contribute to more successful outcomes by limiting its interventions to large, high-powered interstate transmission lines and repealing, reducing, and avoiding intrusions into the process.