

Table of Contents

U.S. Senate	Date: Thursday, October 17, 2019
Committee on Environment and Public Works	Washington, D.C.
STATEMENT OF:	PAGE:
THE HONORABLE MIKE BRAUN, A UNITED STATES SENATOR FROM THE STATE OF INDIANA	3
THE HONORABLE SHELDON WHITEHOUSE, A UNITED STATES SENATOR FROM THE STATE OF RHODE ISLAND	7
TODD WILKINSON, POLICY DIVISION VICE CHAIRMAN, NATIONAL CATTLEMEN'S BEEF ASSOCIATION	15
FRANK MACCHIAROLA, VICE PRESIDENT OF DOWNSTREAM AND INDUSTRY OPERATIONS, AMERICAN PETROLEUM INSTITUTE	20
MARTIN DURBIN, PRESIDENT, GLOBAL ENERGY INSTITUTE, U.S. CHAMBER OF COMMERCE	25
ANDREA DUTTON, VISITING ASSOCIATE PROFESSOR, DEPARTMENT OF GEOSCIENCE, UNIVERSITY OF WISCONSIN-MADISON, GAINESVILLE, FLORIDA	30
JOHN WILSON, VICE PRESIDENT AND DIRECTOR OF CORPORATE ENGAGEMENT, CALVERT RESEARCH AND MANAGEMENT	35

REDUCING EMISSIONS WHILE DRIVING ECONOMIC GROWTH: INDUSTRY-LED
INITIATIVES

Thursday, October 17, 2019

United States Senate

Committee on Environment and Public Works

Subcommittee on Clean Air and Nuclear Safety

Washington, D.C.

The committee met, pursuant to notice, at 10:03 a.m. in room 406, Dirksen Senate Office Building, the Honorable Mike Braun [chairman of the committee] presiding.

Present: Senators Braun, Whitehouse, Barrasso, Capito, Ernst, Carper.

STATEMENT OF THE HONORABLE MIKE BRAUN, A UNITED STATES SENATOR
FROM THE STATE OF INDIANA

Senator Braun. I call this hearing to order. Thanks to everyone for being here today.

We are meeting today to begin the important work of examining our changing climate and its effects on producers of American goods, services, and agriculture. Today, we will hear testimony from experts on the innovative private sector-led initiatives in the U.S. that reduce air emissions while promoting economic growth. We will begin with opening statements and then hear from our panel of witnesses.

I will start here. During the month of August, I traveled around the Hoosier State on my Summer Solutions tour. In the first little over nine weeks, I did visit all 92 counties and got a real good reading of where Hoosiers are on issues related to climate. Nearly every stop, we discussed the importance of sustainability and the need to protect our environment.

As I have learned through visiting with Hoosiers over the past two years, I have concluded the American people are paying attention to these important conversations. You wouldn't know it by watching the news, but we have all been thinking about and investing in this problem for a long time. Everyone, that is maybe except Washington, who has been too polarized for too long to deal with much of anything, particularly our changing

climate. Instead, American innovators and capital have been leading the way, our manufacturing, agriculture, and generation sectors have seen significant improvements from the voluntary adoption of new, lower-carbon corporate practices.

According to the Energy Information Administration, U.S. energy-related CO2 emissions decreased nine-tenths of a percent in 2017 alone. The American economy has been so impressive at reducing emissions that, in 2019, BP noted in its statistical review of world energy that the U.S. was the world leader for reducing carbon emissions, prompting the American Enterprise Institute to note that for the ninth time in this century, the U.S. has had the largest decline in emissions in the world. And we still need to do better.

In fact, in 2017, the U.S. Energy Information Administration found U.S. emission from energy sources hit their lowest level in 25 years, while during those same 25 years, U.S. GDP more than doubled, and real median household income rose by nearly 20 percent.

And yet, innovation continues. In September, Duke Energy, a company which serves 7.2 million customers, announced an ambitious new initiative, which would bring its carbon emissions to net zero by 2050. The world's largest retailer, Amazon, has announced its plan to achieve net zero by 2040. Last year, in an Indiana subsidiary of Nicor, a natural gas that serves almost

4 million customers, announced a Your Energy, Your Future plan. Under this initiative, Nicor plans to cut 90 percent of its greenhouse gas emissions.

What is perhaps most impressive about changes made by industry is that we have been able to accomplish significant emissions reduction while not sacrificing the Country's overall economic competitiveness. But we must constantly remain vigilant of the balance.

There is a real risk that in attempting to curb emissions, American families, workers and businesses will be hit with rising prices, fees and utility bills. It is our duty to balance these two interests. Rather than dictate choices, we should allow for the market to drive new ways to produce and consume energy and goods more efficiently.

However, our national debate is deviated from this balance, instead focusing on policies which would, without question, severely limit consumer choice in many areas, from the type of energy you should use to the kind of car or appliance you should buy, to how much meat you should eat. In the case of the Green New Deal, a complete central planning reorganization of our economy, I believe the effect would be significant, and not in the right direction.

It is one thing when you make these decisions for yourself. It is another one when Washington forces its decisions upon you.

Economic competitiveness would be the real cost of these proposals, when ironically, if we really are going to solve our environmental problems, we will need innovators to produce the technologies to get us there, the hallmark of what has built this Country. This is why today's focus on private sector investment has been so critical, what has been driving these decisions and what the results have been.

I look forward to each of your testimonies as we continue to consider these questions. And I draw the parallel of being on the Health Committee, where we are taking on the health care industry, who I have solely blamed for the pickle we are in with high health care costs, and have asked them to get with it, start fixing yourselves. When 80 Senators weigh in, you should be getting the message.

I have been impressed, in the energy sector, in what we are going to talk about today, the interest within the industry of being responsible in trying to help protect the environment.

Now I would like to recognize Ranking Member Senator Whitehouse for his opening statement. Senator?

[The prepared statement of Senator Braun follows:]

STATEMENT OF THE HONORABLE SHELDON WHITEHOUSE, A UNITED STATES
SENATOR FROM THE STATE OF RHODE ISLAND

Senator Whitehouse. Let me start by thanking Senator Braun for holding this. He is a terrific colleague to work with on these issues. I think there is a real chance for progress in the weeks and months ahead.

I will start my remarks by looking backwards to 1986, when a similar subcommittee of this committee had three days of hearings on climate change. After these hearings, six members of this committee, three Republicans and three Democrats, wrote to the executive director of the now defunct Office of Technology Assessment, and asked for a study of policy options to reduce carbon pollution. They all wrote together that they were deeply troubled by climate change and its implications for the human and natural worlds. Deeply troubled, and implications for the human and natural worlds being quotes from their letter, 33 years ago.

In the intervening decades, carbon pollution and global temperature increase and warming and acidification of the oceans and the experience of climate-related events like wildfires have all accelerated. The disastrous effects of climate change are now plain for anyone who is looking to see. Yet Congress has undertaken no serious legislation to address our climate crisis.

Why is that? Because hundreds of millions of dollars are

spent by the fossil fuel industry to block climate action. Much of this is spent through trade associations and front groups that are controlled by the fossil fuel industry. Two of these trade associations are present here today. The watchdog group, Influence Map, identified the U.S. Chamber as one of the two most obstructionist groups on climate policy. API is not far behind.

There are signs of change at the Chamber, and at the National Association of Manufacturers, the two tied for worst climate obstructers in America. And even at API. I want to express my appreciation to the Chamber for inviting me, of all people, to speak to a Chamber gathering in New York City during Climate Week, which I hope is a sign of good progress to be made in the future.

I appreciate very much also that the chairman and my colleague from West Virginia are working with me to provide federal dollars for developing new technologies to reduce industrial emissions. Our industrial emissions bill is a good one. The Chamber and NAM are supporting it.

But what companies are doing voluntarily to reduce their emissions won't come close to the reductions that we need. A 2018 study by American's Pledge totaled up the voluntary pledges from companies and State and local government emissions reduction commitments and found that they would only result in a

17 percent decline in carbon emissions by 2025, which is well short of even the rather weak-kneed Paris Agreement pledge of 28 percent. We actually need far larger reductions if we are to hold warming to 1.5 degrees Celsius and avoid the very worst of consequences.

Innovation is a beautiful thing. America specializes in it, but it doesn't happen in a vacuum. Without federal policies such as a price on carbon, there is little incentive for businesses to innovate. We have seen this principle proven out over and over, whether for criteria air pollutants under the Clean Air Act, or CFCs under the Montreal Protocol. Federal and international policies provided the framework for businesses to rely on and develop new technologies that reduced those emissions.

Investors also recognize this. More than 200 major investors with \$6.5 trillion in assets under management recently wrote to almost 50 blue chip companies that, "Corporate commitments to embrace energy efficiency and set greenhouse reduction goals are necessary and welcomed, but to facilitate the deployment of capital at a necessary pace and scale, a strong public policy framework is needed."

More than 500 investors with over \$35 trillion in assets under management recently called on policy makers to put a meaningful price on carbon emissions. The reason for this is,

of course, the well-documented warnings which I have forwarded to every single one of my Senate colleagues of a carbon asset bubble crash and a coastal property values crash. Progress on climate is increasingly seen as essential to successful business models in the banking, investment, and agricultural sectors.

To get that progress done, corporate America must ensure that the trade associations to which they belong are not major climate obstructionists. I hope the Chamber and API are getting the message.

If one message can come out of this hearing, it is that it is well past time for corporate America to break the fossil fuel industry's stranglehold on these trade associations, and instead, demand the climate action that is needed to protect our economy and their own business models.

Thank you very much, Mr. Chairman.

[The prepared statement of Senator Whitehouse follows:]

Senator Braun. Thank you, Senator.

I am pleased that we have a great panel here today. Our witnesses come from a wide variety of backgrounds, and I am looking forward to the different perspectives that will facilitate our discussion today.

Our first witness today is Todd Wilkinson, who is co-owner and operator of a commercial cow-calf operation in South Dakota. He is also co-owner of Redstone Feeders, a family-owned cattle feeding and finishing operation, and a founding member and current vice president of the South Dakota Cattleman's Foundation.

Mr. Wilkinson is here today in his capacity as policy division vice chairman of the National Cattlemen's Beef Association. Mr. Wilkinson has practiced law for more than 35 years, specializing in estate planning and agricultural law. He is a graduate of Augustana College and the University of South Dakota Law School.

Our next witness is Frank Macchiarola, the vice president of downstream and industry operations at the American Petroleum Institute, API. He joined API in January of 2016, where he leads association efforts on fuels, refining, marketing, and downstream safety, security, and technology. Prior to joining API, Mr. Macchiarola served as executive VP of government affairs at America's Natural Gas Alliance. From 2004 to 2013,

he worked here in several senior staff positions in the U.S. Senate, including staff director and counsel to the U.S. Senate Committee on Energy and Natural Resources, and minority staff director of the U.S. Senate Committee on Health.

Mr. Macchiarola earned his BA from the College of Holy Cross, and his J.D. from New York University School of Law.

Next in line will be Martin Durbin. Mr. Durbin is the president of the Global Energy Institute at the U.S. Chamber of Commerce. Previously, Mr. Durbin was the executive VP and chief strategy officer at the American Petroleum Institute, and the VP of federal relations at the American Chemistry Council.

Earlier in his career, he served as a staffer for Senator Alan Dixon, and for Congressman Rick Boucher. Mr. Durbin received his bachelor's in government and politics from the University of Maryland College Park.

Fourth will be Dr. Andrea Dutton. She is an associate professor at the University of Wisconsin-Madison where her research focuses on various impacts of climate change, in particular its impact on sea levels. Previously, she spent eight years as an assistant professor in the University of Florida's Department of Geological Sciences.

Prior to her professorship at the University of Florida, Dr. Dutton was a research fellow at the Australian National University, where she worked to understand historical warming

periods. Dr. Dutton holds a bachelor's degree in music from Amherst College, in addition to a master's and Ph.D. both in geology from the University of Michigan. She completed her post-doctoral work at the Australian National University.

Final witness today is John Wilson, the VP and Director of Corporate Engagement for Calvert Research and Management. His firm specializes in responsible and sustainable investing across global capital markets. Mr. Wilson leads the design and execution of Calvert's corporate engagement and shareholder activism strategy.

He began his career in the investment management industry in 1997. Before joining Calvert Research, he was the head of governance and research at Cornerstone Capital Group. He also served as the director of corporate governance at TIAA-CREF and was the director of socially responsible investing at Christian Brothers Investment Services.

John earned a B.A. in English from Georgetown University, an MBA in finance from Columbia University and an MIA in economic and political development from Columbia University School of International and Public Affairs.

I want to remind the witnesses that your full written testimony will be made part of the official hearing record. Please keep your statements to five minutes, so that we may have plenty of time for questions.

We look forward to hearing your testimony, beginning with Mr. Wilkinson. Please proceed.

STATEMENT OF TODD WILKINSON, POLICY DIVISION VICE CHAIRMAN,
NATIONAL CATTLEMEN'S BEEF ASSOCIATION

Mr. Wilkinson. Good morning and thank you, Chairman Braun and Ranking Member Whitehouse. My name is Todd Wilkinson. I am an owner of a cow-calf operation with my son and a part owner of a commercial feed yard with my brothers near to Smith, South Dakota. I am proud today to testify on behalf of the American cattle producers.

The United States has one of the lowest beef greenhouse gas emission intensities, 10 to 50 times lower than other countries around the world. That statistic is not accidental. American cattle producers work hard to implement new technologies and practices that reduce our environmental impact while simultaneously increasing our efficiency.

Farmers and ranchers face increasing pressure from consumers to be socially responsible while managing existing environmental responsibility and attempting to remain economically viable. According to the U.S. Environmental Protection Agency, direct emissions from cattle represent just 2 percent of all greenhouse gas emissions in this Country.

Climate change policies that unfairly target cattle producers fail to recognize the positive role of cattle. Rather than waiting for Congress to adopt misguided policies that threaten the viability of this key industry in the climate

fight, we hope to shift the conversation to continue to be the innovators.

Cattle graze on over 660 million acres in the United States. That is nearly a third of our Nation's continental land mass. This acreage not only feeds cattle, but also sequester carbon. The ruminant grazing enhances sequestration. Emissions from cattle are a part of the natural cycle of the methane.

Cattle consume grasses and then emit methane through belches as a part of the ruminant digestive process. In just 10 years, more than 90 percent of that methane oxidizes in the atmosphere and converts to CO₂. The CO₂ is then absorbed by grasses. Those grasses are eaten by cattle, and the process goes on and on.

Methane has no long-term impact on the climate when the emissions and the oxidation are in balance. While cattle are a nominal contributor to America's overall greenhouse gas emissions, our industry works to further increase our efficiency every day by implementing grazing management systems. Our operation developed a grazing management system through USDA's Natural Resource and Conservation Service, which guides our implementation of a rotational grazing system. Rotational grazing creates an opportunity for cattle to intensely graze pastures, thereby compounding carbon sequestration while naturally decreasing weed and invasive species growth.

If producers have learned anything, it is that there is no one size fits all, no silver bullet solution. Cattle producers across the Nation effectively implement voluntary conservation practices with technical assistance from USDA and land grant universities. The benefit of technical assistance is its personalized approach. Local NRCS employees work with agricultural producers to implement a suite of conservation practices best suited to fit each individual need.

Voluntary conservation practices supported by research and implemented by producers with technical assistance are the keys to increasing efficiency and resilience. The American cattle herd provides an incredible environmental benefit through unmatched ability to upcycle byproducts. Upcycling we define a concept of using discarded materials to create a higher value product.

In addition to the cattle's ability to turn grass into a nutrient dense protein, cattle also upcycle other byproducts when they move from pasture to the feed yard. Ninety percent of the cattle feed yard is human-inedible. At Redstone Feeders, we feed a byproduct of an ethanol called distiller's grain. By feeding distiller's grain to cattle, not only do we provide the animals with an essential set of nutrients, but simultaneously reduce the greenhouse gas emissions.

Distiller's grain is just one example. There are many

byproducts that are fed to cattle to enhance their diet in a safe and efficient manner, including potato peelings, bakery trimmings, even byproducts of chocolate.

NCBA was a founding member of the U.S. Roundtable for Sustainable Beef. The roundtable is a multi-stakeholder organization which aims to demonstrate and improve beef sustainability. The roundtable began with a discussion on how we, as members of the beef value chain, can directly and measurably impact sustainability. This approach is unique from previous sustainability efforts, because it is anchored by the institutional knowledge of America's cattle producers.

Farmers and ranchers are America's original conservationists. We provide a safe and affordable beef supply, and we work hard every day to ensure that we can pass our operations on to the next generation.

Thank you, and I look forward to your questions.

[The prepared statement of Mr. Wilkinson follows:]

Senator Braun. Thank you. Mr. Macchiarola.

STATEMENT OF FRANK MACCHIAROLA, VICE PRESIDENT OF DOWNSTREAM AND
INDUSTRY OPERATIONS, AMERICAN PETROLEUM INSTITUTE

Mr. Macchiarola. Thank you, Chairman Braun, Ranking Member Whitehouse, and Senator Capito. Thank you for the opportunity to testify this morning.

The subject of today's hearing raises important policy questions affecting our Nation's economic strength, energy security and environmental stewardship. How we address these topics will have meaningful implications for our Nation's future and our standing globally.

Over the past decade, the United States has experienced a dramatic transformation in our energy landscape. Ten years ago, energy analysts and policy makers spoke in terms of energy scarcity with the expectation that we would predominantly be importing natural gas from the Middle East, Russia, and West Africa to meet our growing energy demand. On the petroleum side, a similar picture was emerging, with projections of flat domestic production and growing dependence on foreign sources of oil.

As a result of oil and natural gas industry innovation, and the advancement of engineering technologies, such as hydraulic fracturing and horizontal drilling, we speak today in terms of energy abundance and our Nation's energy future is bright. Domestic oil production has risen from five million barrels per

day in 2009 to now more than 12 million barrels per day today. On the natural gas side, U.S. production of natural gas has increased by more than 50 percent over the last decade, with natural gas deliveries to electric power consumers doubling since 2004.

American oil and gas development and production from unconventional shale resources has fundamentally changed the energy landscape while creating economic growth and significant employment opportunities across the Country. And Congressional leadership to end the crude oil export ban has favorably reshaped our Nation's energy security posture.

The U.S. is poised to remain the world's leading producer of oil and natural gas, which will continue to help strengthen our economy and national security for years to come. Challenges remain, however. And the oil and natural gas industry is committed to meeting these head on. One such challenge includes addressing the risks associated with global climate change through collaborative efforts of private industry, government, and the public.

The oil and natural gas industry is focused on solutions to help reduce greenhouse gas emissions, while ensuring access to affordable and reliable energy that helps enhance our standard of living around the world. At the same time, the U.S. has become the leading producer of natural gas, CO2 emissions here

at home have declined to their lowest levels in a generation. From 2005 to 2017, the U.S. economy grew by 20 percent, while CO2 emissions fell by 14 percent overall.

In addition to reductions in emissions of CO2, the growth of natural gas in power generation over the last several years has led to significant reductions in nitrogen oxide, sulfur dioxide and particulate matter emissions, contributing to cleaner air for all Americans. Importantly, while we have experienced a dramatic increase in U.S. production of natural gas, emissions of methane from our industry have decreased over the past 20 years. The story here is the same. We have accomplished positive environmental outcomes by advancing technologies that ensure we are capturing both VOCs and methane.

Our industry has been at the forefront of innovation, developing technologies to reduce emissions from hydraulic fracturing completions, storage tanks, pneumatic controllers, and leaks. We have worked directly with the EPA since the early days of the Obama Administration in 2010 to ensure that EPA's regulations incorporate these and other effective emissions reductions requirements. And we continue to support these regulatory requirements.

Our industry has also established the Environmental Partnership, a program for continuous improvement in environmental performance with an initial focus on VOC and

methane emission reductions. There are currently 67 companies participating in the program, including 18 of the 20 top natural gas producers. Companies in the partnership agree to implement emission reduction programs for leaks, pneumatic controllers, and for liquids unloading operations.

On the downstream side of our industry, more than 98 percent of vehicles on the road use our fuels to conduct commerce, commute to work, go on vacation, and visit loved ones. Today this is done with cleaner fuels that allow automobile manufacturers to build engines that reduce emissions. This progress has helped drive significant reductions of major air pollutants, even as vehicle miles traveled have tripled.

A strong natural gas sector and a strong oil sector is essential to our Nation. Our industry supports 10.3 million jobs in nearly 8 percent of the U.S. economy. More importantly, the men and women who work in our industry are committed to providing reliable and affordable energy, and to protecting the environment. After all, they live in the communities in which they work. Through a balanced approach that promotes innovation and smart regulation, we can provide affordable, abundant energy that Americans rely upon. And we can do it with an emphasis on environmental protection and stewardship.

Thank you, and I look forward to your questions.

[The prepared statement of Mr. Macchiarola follows:]

Senator Braun. Thank you. Mr. Durbin.

STATEMENT OF MARTIN DURBIN, PRESIDENT, GLOBAL ENERGY INSTITUTE,
U.S. CHAMBER OF COMMERCE

Mr. Durbin. Thank you, Chairman Braun, Senator Whitehouse, Senator Capito. Thanks for the opportunity to testify today.

Let me start by saying the Chamber believes the climate is changing, and that humans are contributing to these changes. Inaction on climate is not an option, and there is much common ground on which all sides of this discussion should come together to address climate change with policies that are practical, flexible and durable. We also believe in a policy approach that considers costs, benefits, and the competitiveness of the U.S. economy.

In order to tackle the global climate challenge, we must commercialize and deploy clean energy technologies. It will be largely up to the business communities to develop, finance, build, and operate the solutions needed to power economic growth worldwide, mitigate greenhouse gas emissions, and build resilient, lower carbon infrastructure. In short, we will need more energy with fewer emissions. The good news is, we are up to the challenge.

Thousands of companies have already taken voluntary steps to reduce emissions and have pledged further reductions. Sustainability plans are now the norm for major corporations. Our Global Energy Institute has launched an Energy Innovates

initiative to showcase the innovators, projects and technologies that are shaping America's future energy landscape.

The specific examples are included in my written testimony, but we have highlighted technologies such as battery storage, advanced nuclear, power plants that utilize CO2 itself as an energy source, and energy efficient, smart neighborhoods. All of these technologies will be needed.

Such technologies are being developed and deployed first in the United States, but ultimately, are an opportunity for the U.S. to become the world's leading exporter of clean energy technology. This will not only be a business opportunity and an economic boon, but also a way for the U.S. to take a leadership role in reducing global emissions and to improve the quality of life in developing countries that lack access to the basics, like electricity and refrigeration.

These global realities illustrate the paramount importance of technological breakthroughs that will enable financially constrained developing countries to adopt the technologies necessary to slow and ultimately reverse emissions growth. The good news is that numerous technologies hold great promise to do just that, and that is why the Chamber has made the development and acceleration of these alternatives a top priority.

All told, the private sector was responsible for more than \$45 billion of energy-related research and development in 2017.

But we can't do it alone. There remains an important role for the Federal Government to play in technology development, including through the Department of Energy's National Laboratory System. However, statistics show that the U.S. investment in R&D is only average compared to other developed nations. The Chamber has long supported increasing R&D budgets with programs like ARPA-E, a great example of what can be accomplished.

We agree more must be done to meet the challenge of climate change. The Chamber has established a task force on climate actions which will help us gain a better understanding of the range of mechanisms, innovations, and internal processes that our members are employing to address climate change. This dialogue will make us smarter about how existing policies and future proposals affect our broad membership. What we learn will help inform our approach to legislation and other policy proposals to address this important issue for our members, the Nation and the world.

That said, we believe there are concrete actions Congress can take now which would help accelerate the innovation agenda necessary to address this challenge. We recently led a letter with 27 organizations from across the political spectrum, calling on Senate leadership to schedule Floor time for a series of legislative proposals which would reduce emissions. My written testimony highlights the specific bipartisan legislation

the Chamber supports, many of which were introduced or are co-sponsored by members of this committee.

As we said in that letter, more needs to be done. But there is no reason to delay passage of initiatives we know would help us reduce emissions right now. Doing so would send a signal that Congress is serious about this issue.

American businesses have a long history of rising to the world's challenges. Companies and entrepreneurs are bringing innovation, technology and ingenuity to the climate change challenge. We believe combatting climate change and growing the economy can and should go hand in hand. Our members are already hard at work in bringing solutions to the table.

Thank you for the opportunity to testify. I look forward to your questions.

[The prepared statement of Mr. Durbin follows:]

Senator Braun. Thank you. Dr. Dutton?

STATEMENT OF ANDREA DUTTON, VISITING ASSOCIATE PROFESSOR,
DEPARTMENT OF GEOSCIENCE, UNIVERSITY OF WISCONSIN-MADISON,
GAINESVILLE, FLORIDA

Ms. Dutton. Thank you, Chairman Braun, and Ranking Member Whitehouse, for inviting me to speak today.

I am a geochemist and field geologist who conducts research on past climate and sea level change. The main purpose of my research is the behavior of sea level and polar ice sheets during past warm periods to better inform us about future sea level rise.

My research accomplishments have been widely recognized, for example, as a Fellow of the Geological Society of America, as a Fulbright Scholar, and as a newly minted MacArthur Fellow.

I am here today to offer you my expert opinion as a geologist and climate scientist on the scale of the challenge that we face from industrial greenhouse gas emissions and resulting human-caused global warming. The devastating impacts of climate change will vary by region. Some will contend with worsened wildfires, while others will grapple with intensified inland flooding or rainfall, inundation from sea-level rise, or more intense and slower-moving hurricanes.

This list may evoke personal memories of extreme weather events from the past few years. That is because climate change is already here and it is going to get worse before it can get

better.

All regions of the U.S. will experience higher temperatures. Consider Florida, where I have lived for the past nine years. In 2000, Miami had 24 days with a heat index at or above 105 degrees Fahrenheit, the official danger level according to the National Weather Service. By 2030, Miami is projected to experience 126 danger days a year, that is about 1 in 3 days, where crippling heat will make it dangerous for people to be outdoors.

Are voluntary reductions in industrial emissions enough to avoid such futures? The answer is no. They don't even come close. Voluntary reductions are but proverbial drops in the bucket. Because of decades of relative inaction, the scale of the problem has grown and time to act is rapidly shrinking. Policy solutions must therefore be bold, moving us rapidly toward net-zero emissions, with the aid of stringent and integrated policy interventions, including putting a price on carbon.

Reductions do not happen in a vacuum, though. They are driven by policy, which in turn drives innovation to meet new targets.

As a geologist, with the perspective that deep time brings to this issue, I offer these four critical insights. Number one, we are conducting an uncontrolled and unprecedented

experiment here on Planet Earth. Our extensive knowledge of past climate change reveals that there is no other event in Earth history that approaches the combined rate and magnitude of change that we are causing, aside from cataclysmic events such as the massive asteroid impact that marked the end of the Cretaceous. While Earth survived the impacts, the dinosaurs did not, nor did about 75 percent of all marine species. Climate change is not so much about saving our planet, then, as it is about maintaining thriving ecosystems that support human civilization.

Number two, while there are natural, stabilizing processes that draw down carbon dioxide levels in the atmosphere, they are too slow, by several orders of magnitude, to keep up with the rate at which we are pumping them into the atmosphere. It would take many thousands of years to draw down the carbon dioxide that we have already emitted.

Number three, our actions today will impact the climate for millennia to come, a lesson drawn from studies of geological changes. The U.S. leads the world in cumulative carbon emissions. The faster we slash these emissions, the less dangerous the outcomes. Committing to additional fossil fuel infrastructure, conversely, locks in more dangerous impacts.

Number four, finally, the geologic record tells us that we can expect big impacts from what sound like small perturbations.

We are already witnessing the effects of climate change at just over 1 degree Celsius and every fraction of a degree matters. For comparison, Earth was no more than 4 degrees Celsius colder at the peak of the last ice age, when ice sheets more than a mile thick covered parts of North America and mammoths and mastodons roamed through present day Florida.

My own research tells us that increasing Earth's temperature by as little as 1 degree Celsius could commit us to at least 6 meters, that is 20 feet or more, of sea-level rise. If we don't enact policies to reduce greenhouse gas emissions as the best available science dictates, we are committing to a very expensive and dangerous future.

Talking to Floridians on the front lines of sea-level rise, I know they are deeply concerned about climate change and want to know what is being done. During the recent global climate strike led by our youth, millions took to the streets telling us in no uncertain terms that it is up to us to act now or we take their future from them. As a mother, as a scientist, and as a citizen of the United States, I hear their call. And I hope that you will too.

Thank you.

[The prepared statement of Ms. Dutton follows:]

Senator Braun. Thank you. Mr. Wilson.

STATEMENT OF JOHN WILSON, VICE PRESIDENT AND DIRECTOR OF
CORPORATE ENGAGEMENT, CALVERT RESEARCH AND MANAGEMENT

Mr. Wilson. Chairman Braun, Ranking Member Whitehouse, thank you for your invitation to speak before you today.

My name is John Wilson, and I am Vice President and Director of Corporate Engagement for Calvert Research and Management. Our firm sponsors one of the largest and most diversified families of responsibly invested mutual funds. We seek to generate favorable investment returns by allocating capital consistent with financially material environmental, social and governance issues and through structured engagement with our portfolio companies.

Climate change is an urgent issue for us as fiduciaries because investment returns depend on a robust and growing economy. The U.S. Government's Fourth National Climate Assessment makes clear that unchecked climate change could reduce economic activity in several U.S. sectors by hundreds of billions of dollars by the end of the century. We believe our investment portfolios will be exposed to these risks within the coming decades, well within a typical investment time horizon.

As one element of our overall investment analysis, we evaluate the exposure of companies we invest in to the risk of climate change. This assessment is consistent with well-grounded empirical evidence. A recent meta-analysis of 32

studies found a negative correlation between corporate carbon emissions and financial performance. Many mainstream investors and companies now support action on climate change. Three hundred and sixty investors with \$36 trillion under management have committed to engage the top greenhouse gas emitting companies in dialogue about how they can drive a transportation toward a clean energy economy and achieve the goals of the Paris Agreement.

On the corporate side, nearly 7,000 companies world-wide now report on greenhouse gas emissions and mitigation strategies to the Carbon Disclosure Project, the most comprehensive database of this information in the world. According to CDP, the 215 largest global companies alone report over \$1 trillion of capital at risk from climate impacts, many of which may be felt in the next five years.

Among the many industries making commitments to transform their business models, at least 17 U.S. utilities have pledged to cut emissions by at least 80 percent by 2050, to the Chairman's earlier point. And all major automotive companies are investing heavily in low or no-carbon transportation alternatives, and committing to expand their lineup of electric powered vehicles.

Despite the efforts being made on all sides, consensus is emerging among both investment professionals and corporate

executives that voluntary efforts will not be enough. Business incentives are misaligned because those responsible for the emission of greenhouse gases do not bear the costs of climate-related harms such as extreme weather events, drought, or sea level rise. Instead, those costs are borne by the entire market.

For this reason, a coalition of 515 institutional investors with \$35 trillion under management urged world governments to enact enabling policy to meet the goals of the Paris Agreement, in part by helping to accelerate sound business investments in climate mitigation. A clear policy signal, such as a carbon price, would allow investors to better quantify the economic implications of climate change on investment decisions.

For companies, it would help to overcome the pressures of short-termism, which sometimes hampers long-term innovation. We observe, for example, that a mix of subsidies and requirements has helped to incentivize research and development that has rapidly reduced the cost of wind and solar energy over the last several years.

Both corporations and investors can and should make important contributions to the public dialogue about climate change policy. We are concerned, however, that some companies have failed to align their public policy engagements with their long-term business strategies to invest in climate solutions.

In response, 200 investors with \$6.5 trillion under management forwarded a letter to company CEOs calling on them to harmonize their lobbying activities with the goals of the Paris Agreement.

This letter asks companies to develop governance procedures to ensure consistency between long-term business strategy and public policy engagement, including both direct engagement as well as lobbying by intermediaries, such as trade associations and social welfare organizations.

We are pleased that some of these third parties have recently expressed support for action on climate change, and encourage them to back up their words with substantive action consistent with the scale of the economic challenge that we face.

Most concerning to us as investors is the lack of U.S. leadership in climate policy. Rather than supporting investors and companies' efforts to make economically rational long-term investment decisions, the Federal Government is moving in the opposite direction, first by initiating steps to withdraw from the Paris Agreement, and most recently by seeking to block States' efforts to address the issue.

A failure of the U.S. to address climate change could impact U.S. competitiveness relative to countries that are supporting the next generation of technology and solutions. Investors and companies across the globe are collaborating with

the public sector to address the risks that greenhouse gases pose to portfolios and long-term business investment. The absence of U.S. government leadership from this partnership ensures that these technologies and solutions will arise elsewhere.

We urge the committee to support legislation that will allow us to rapidly scale investments in climate change mitigation, and I would like to thank the committee for allowing me the opportunity to share my perspectives on these important topics. Thank you.

[The prepared statement of Mr. Wilson follows:]

Senator Braun. Thank you.

I am going to start with the questions, and I would like to address the first one to Dr. Dutton. I really do believe that the dynamic we are facing is significant. I think Senator Whitehouse and I have talked about modeling that is out there, that is going to give believability to where you don't, it is going to be hard for any of us to react to something where the world is going to end in 12 to 15 years. We are already beyond the point of redemption, I am going to guess, if that happens.

I think to make this salable to the American public, we all know that sea levels will rise over time. I think you referred to six meters, over what period of time? When do you expect that?

Ms. Dutton. Great question. So my research, a lot of it has focused on looking at past warm periods, trying to understand how much the ice sheets melted and then how quickly that happened, which is what you are asking there.

Senator Braun. Yes.

Ms. Dutton. So that six meters, or 20 feet, will not happen in your lifetime or mine. But the problem is, we don't know the full answer to that question yet. And that is in part because we have never been around to witness dynamic retreat of Greenland and Antarctica of the type that is starting to happen now. So we don't know all of the physics involved in that ice

sheet retreat. And that is the largest uncertainty when we look at sea level projections into the future.

However, having said that, we are certain that sea level is rising. So that uncertainty about exactly how quick shouldn't really be the focus of the issue. Yesterday in the Miami Herald, they reported that the northern part of Key Largo has now been underwater, a neighborhood, for more than 40 days in a row. And they are in about a foot of water.

Right now, tides up and down the U.S. east coast from New York to Miami are running about a foot to a foot and a half higher than predicted. It is not just because of sea level rise, but additional impacts of swell and, when you get intense rainfall, there is no place for it to go.

So these effects will in fact happen sooner than most people think they will.

Senator Braun. What would be the next two or three biggest general impacts? We all know sea level, because we hear that all the time. Can you graphically give us what you think the next two or three biggest differences would be in terms of how it is going to impact everyday life?

Ms. Dutton. Right. Well, there are a myriad of ways. As you know, there is a domino effect as well.

But one thing I have been focusing on recently when I give public talks is just the heat, which came up in my testimony

today. So if you have experienced heat of 105 degrees, it is crippling. Even though I work most of the day indoors, and I go outside just to walk to my car, it feels miserable, right? You can't do much outside then.

So heat, there is a limit of the heat that we can tolerate as humans and still perform as we expect to. So heat is a big one.

Another one is the wildfires that we are now seeing play out across the western U.S. The area of those wildfires is growing, and a lot of it is attributable to climate change. And hurricanes are more intense, slower-moving hurricanes are going to be big contenders. Part of the reasons I highlight these wildfires and hurricanes, they require huge responses in terms of federal disaster management. And the rapid intensification that we have seen in some of these hurricanes, which is a trend that should increase with increasing temperatures, makes it very difficult from an emergency response perspective.

Senator Braun. One final question on the subject of what might happen. Does climate change in any fashion have an effect that would not be catastrophic? In other words, in places where, just to get it out there, I would like to hear, or is it just universally going to be destructive and bad?

Ms. Dutton. So you may argue that some people, it might benefit them. So maybe you can grow apples farther north or

something like that. The problem is, the rate at which the temperatures are changing and these zones are migrating northward are too fast for us to keep up in terms of infrastructure. We have developed and built things based on the climate of that region. To expect farmers to say, oh, well, instead of planting this, now I am just going to complete change and do something different, we just can't adapt that quickly. And that rate of change is really the biggest challenge.

Senator Braun. Thank you. I am going to go to Senator Whitehouse here in a moment.

But I think the thing I grapple with mostly is how we marshal the resources, especially in the context of a place that is not functioning here well currently, with trillion-dollar deficits, when you look at what the cost would be. So there is going to be a lot of practicality that is going to have to be applied, in how you start the correction.

That is why I think that the more accurately we can have models that we can trust would be kind of the selling tool to take this in a broader way, not only here, but to convince industry and emitters across the board that it is happening, and to make it realistic on the other side of how we marshal the resources to combat it.

Senator Whitehouse.

Senator Whitehouse. Thank you very much, Chairman, and

thank you again for this hearing.

Let me start by asking Mr. Durbin and Mr. Macchiarola whether your trade associations ordinarily develop policy positions based on the consensus position of your member companies.

Mr. Durbin. Yes, we strive for consensus with the members to reach a policy position.

Senator Whitehouse. Mr. Macchiarola?

Mr. Macchiarola. Yes, Senator, policy establishment at API is largely based on the consensus-based approach, as well as principled based approach, reflecting the views of the broad membership of the association.

Senator Whitehouse. So, Mr. Durbin, let me follow up a little bit more in detail about the Chamber. As I understand it, the Chamber has several dozen policy committees. And your member companies can pay extra to sit on those policy committees, is that correct?

Mr. Durbin. Well, the policy committees, there are various affiliates, including the Global Energy Institute that I lead, where members can pay to be a part of that group. But the broad policies of the U.S. Chamber are set by the board of directors of the broad U.S. Chamber.

Senator Whitehouse. Is there a policy committee on environment and energy?

Mr. Durbin. There are two separate committees that are open to the broad membership, again, every member, one on energy and agriculture, the other on environment and air. Just had a call with them yesterday. Yes, those committees do exist.

Senator Whitehouse. If there is a call that goes out to the members of those committees, do you contact every single member of the Chamber? Or is there some way in which companies have identified their interest in that committee and you have a list?

Mr. Durbin. Exactly. They opt in.

Senator Whitehouse. And do they compensate the Chamber in any way for the right to opt in?

Mr. Durbin. Not beyond their membership.

Senator Whitehouse. It is a function of their regular dues?

Mr. Durbin. Indeed.

Senator Whitehouse. Can you tell me which companies, this probably should be a question for the record, the two committees that you mentioned, can you tell me which companies sit on them?

Mr. Durbin. Sir, I will take that as a question for the record.

Senator Whitehouse. Great. I don't expect you to have that off the top of your head.

Do you know how much the companies on those two policy

committees contributed to the Chamber, let's say, in 2018, to the Chamber and its affiliates?

Mr. Durbin. I don't. I can look into that, and not every company pays the same amount.

Senator Whitehouse. We will make that a question for the record, also.

Do you know how much in total fossil fuel companies and allied organizations contributed to the Chamber in 2018?

Mr. Durbin. Again, I will get back to you on that.

Senator Whitehouse. Okay, we will make that a question for the record, too.

Do you know if the Chamber and its affiliates take money from non-corporate sources of funding, such as political advocacy groups?

Mr. Durbin. Not to my knowledge. And I promise I won't play this line too frequently today, but yesterday was, now there are six weeks. So I would be happy to get back to you, like so many of those, I would be happy to get back to you on a question for the record.

Senator Whitehouse. Okay, we will follow up. Do you know if Marathon Petroleum is a member of either of the two policies that you mentioned?

Mr. Durbin. I believe they participate.

Senator Whitehouse. In both?

Mr. Durbin. I don't know.

Senator Whitehouse. Okay. So a lot of this is going to end up as questions for the record, and I appreciate that you are newer there, and some of these are specific questions that you shouldn't be expected to know the answer to off the top of your head. So turning them into questions for the record is fine with me.

Do you know much ExxonMobil contributed to the Chamber and its affiliates in 2018?

Mr. Durbin. I do not. I will get that.

Senator Whitehouse. Can you tell me what Chamber member companies were consulted by the chamber about the Chamber's decision to sue EPA to block the Clean Power Plan?

Mr. Durbin. Again, I can get back to you on the process that was used to determine that.

Senator Whitehouse. I have the question with respect to the Chamber's decision to sue EPA to block the Clean Power Plan, the same question regarding the Chamber's decision to intervene in litigation to support the Trump so-called ACE rule, the replacement for the Clean Power Plan. And third, the Chamber's decision to fund a study critical of the Paris Agreement that has since been widely debunked. So that is a QFR, I guess, times three.

Mr. Durbin. Okay.

Senator Whitehouse. So my time has expired for this round of questioning, and I will yield back. My apologies for going over a few seconds.

Senator Braun. Thank you. It looks like we are going to have plenty of time to ask questions.

[Laughter.]

Senator Braun. One of the vexing issues of what we are dealing with is that there has been great progress made here in our own Country. I do remember vividly when the Cuyahoga River caught on fire. I couldn't believe that could even happen. I know that even a local river, the White River, borders the northern edge of our county. Never, 20, 25 years ago, would we have fished in it, let alone eat the fish. Now I routinely see eagles along it. And we do fish, and eat the fish.

So in places, we have made great strides. I really think it is important that I think we are leading the way, but we were the largest emitters. I guess the only good news is internationally, we have been eclipsed by China.

So I don't want to get, and I am really worried about how we get the rest of the world to see the light when coal facilities are still being built, and it doesn't seem like that same trajectory is necessarily occurring.

Mr. Wilkinson, I want to ask you, because I heard when it comes to something like beef production, did I hear correctly

that the methods used elsewhere would emit, what was the quantity more in terms of greenhouse gases?

Mr. Wilkinson. Ten to 50 percent, or 50 times more than us.

Senator Braun. That is what I thought I heard you say. That is unbelievable in terms of how the methodologies could be that different. I think where beef production in the U.S., you said, was 2 percent of emissions, is that within the Country, or is that across the world?

Mr. Wilkinson. No, that is within the Country.

Senator Braun. Okay. And then, what is it in terms of beef production across the world? Assuming if we are much better, where would it stack up in terms of what that particularly would be generating across the world? Do you know that?

Mr. Wilkinson. Depending upon the metrics that you use to measure that, it is anywhere from 3 to 5 percent across the world. We are statistically lower than that because, frankly, we are more efficient. The example I can give you with that is back in the 1970s, we had a third more cows. And yet we produce the same amount of beef today with a third less cows.

Senator Braun. Better feed conversion.

Mr. Wilkinson. Better feed conversion, better genetics. Our producers are, that is their life blood. They want to

improve all of those traits.

Senator Braun. And could you cite a couple of the methods? I was a turkey farmer for 32 years. I know all the advances that were made, better feed conversion. Of course, that lowers your footprint. What has happened in the cattle industry? I think that is one of the things that has been thrown out there in kind of a figurative way as being a part of the problem. I am glad you pointed out what that is percentage wise here and across the globe.

Talk about a couple or three things that have really made a difference over the last decade.

Mr. Wilkinson. Well, in my lifetime, the biggest one I can point to right off the top is rotational grazing, intensive grazing. When I started out in the industry, when my brother started out in the beef business, we didn't do rotational grazing. It seemed counter-intuitive, the fact that we would put our cow herd on a confined area and let them graze that area more intensely. We just let them generally run over the tract of land.

Now we specifically have those areas fenced off, and we rotate them in and out of those various paddocks. As a result of that, and again, it is logic, I guess, when you examine it after this many years, as a result of that, the cattle eat down the grass, the root system goes down deeper into the soil and

more carbon is sequestered.

Another one is distiller's grain. That is a great example of, it causes us to use less corn, and it is a byproduct. But it has improved the efficiency of the animals.

And I have to end up saying for the seed stock producers that we represent that the genetics of the animals, that the seed stock, if you looked at what was a champion bull in 1950 in the Angus breed, it is going to be about this high. I mean, that animal is now bigger in stature, it can put more pounds on more efficiently. So our seed stock producers are doing a wonderful job.

Senator Braun. It begs the question, and give me a quick answer here, why has not the rest of the world copied what we have done here, if you are assuming that we still need beef production? Why haven't those techniques been used across that other 3 percent that maybe totals 5? It seems like we could get emissions from beef production almost down to 3 percent in total if others would copy the methodology.

Mr. Wilkinson. Well, Senator, the first one I am going to have to point out is India. They have an affinity to not want to eat beef. So there is a bit of a problem there.

But if you look at Australia, Brazil, two of our biggest competitors, our geography gives us a competitive advantage over those areas. We are not having to deforest, cut down forests,

to increase our grazing capabilities. We have natural prairies and forests where we can graze at. We can take out the fire load out of our forests rather than cut them down.

Senator Braun. So it gives us a comparative advantage.

Mr. Wilkinson. Yes, it does give us some advantage.

Senator Braun. Senator Whitehouse.

Senator Whitehouse. Thank you again, Chairman.

Mr. Durbin, I will follow up with two questions on our previous line of questioning. Am I correct that there are different membership levels in the U.S. Chamber of Commerce, Signature Advantage Elite, and C100?

Mr. Durbin. There are different levels.

Senator Whitehouse. And am I correct that your website shows that the option to serve on these policy committees is for those who subscribe to the Elite and C100 higher membership levels?

Mr. Durbin. Again, let me get back to you on that question.

Senator Whitehouse. Okay. Let me put the web page into the record as an exhibit so it is clear what I have been talking about.

[The referenced information follows:]

Senator Whitehouse. Just today, the Chamber scorecarded the Senate resolution to disapprove the Trump ACE rule. My information is that the so-called ACE rule requires zero emissions from natural gas. And further, that from coal, while it encourages certain efficiency improvements, it offsets those with opportunities for increased generation and could actually increase emissions.

So again, you guys just put this out today, neither you nor I have had a chance to review it. But I would like to ask you, the Chamber, for the record, to respond to how it is that the Chamber is willing to support a rule designed to reduce carbon emissions that actually doesn't reduce carbon emissions, and appears to have been a product of the fossil fuel industry's work.

I don't want to sandbag you with that, because I didn't get it until just now myself. So we will leave that as a question for the record.

Mr. Macchiarola, let me ask you a little bit about API. In my experience, ordinarily, trade associations set their membership dues with some correlation to the member corporations' revenues or profits. Is that the way API operates?

Mr. Macchiarola. Thank you for your question, Senator. API generally sets its dues structure on the basis of production

on the upstream side, throughput on the downstream side.

Senator Whitehouse. So bigger companies should be expected to pay more.

Mr. Macchiarola. Larger producing companies within the United States would be expected to pay more, that is correct.

Senator Whitehouse. Okay. You, API, I mean, supported the Trump proposal to scrap the rules regarding methane emissions at oil and gas facilities. Is that correct?

Mr. Macchiarola. API supports the current methane rule in place in 2011 and 2016. We support the --

Senator Whitehouse. The August proposal by EPA, you publicly support it, correct?

Mr. Macchiarola. Correct.

Senator Whitehouse. At the same time, ExxonMobil and BP and Shell publicly criticized that proposal. Based on the way in which you have said you calculate your dues, I would expect that ExxonMobil and BP and Shell would be three of API's biggest contributors, correct?

Mr. Macchiarola. That is correct, Senator.

Senator Whitehouse. I am interested in how API took this position, just to use this as one example, contrary to the public positions of three of its largest members. Can I ask you just to frame this out, how much money ExxonMobil, BP, and Shell gave to API for 2018?

Mr. Macchiarola. Senator, with respect to the specific question regarding membership dues, I don't know the answer to that. So I will have to get back to you for the record.

Senator Whitehouse. Not a problem. That is not a problem at all.

Mr. Macchiarola. With respect to the consideration of support or opposition to a specific rulemaking, as you referred in your previous question, Senator, we are a consensus-based organization that takes into account the views of the broad spectrum of the membership, and work very hard to represent the industry and not one individual member, regardless of the size of the member.

Senator Whitehouse. Let me add to the QFR question you are taking back also Marathon Petroleum, in addition to the three companies I named, in terms of what their contributions were to API during or for 2018.

The reason I am asking these questions -- may I extend it another minute? The reason I am asking these questions is because Exxon and BP and Shell have taken a number of public positions that are contrary to positions that API then comes and pushes in Congress. The most significant of them is that Exxon, BP, and Shell all publicly say they support a price on carbon.

So my question to you is, can you share with us any sincere effort by ExxonMobil, BP, and Shell to support carbon pricing

within your organization or to have you reflect their views in opposing the methane rule? What I am trying to get at is the extent to which Exxon, BP, and Shell are just basically greenwashing themselves with public statements while leaving you to do the dirty work of opposing things they claim to support.

So I don't know what information you can give me along those lines, but that is where this line of questioning is trying to get. I see very big companies that presumably contribute very significantly to your organization that seem to be economic winners from things you do that they claim not to support. And that is the discrepancy that concerns me here.

Mr. Macchiarola. Senator, it doesn't -- so that is not unusual for trade associations, first off. And secondly, it doesn't fall on that side of the ledger every time. For example, I look at the issue of CAFE standards, we had member companies who have positions that would be more against your position on CAFE closer to the position of the Trump Administration. And our association actually did not take that position.

So again, to your earlier point, sir, we are a consensus-based, principle-based organization. We are not an organization that is dictated by one member's view. We wouldn't last as a trade association that long, because we don't represent one member, we represent the broad spectrum of the industry.

I appreciate the point, Senator.

Senator Whitehouse. I've gone well over my time, and I will just make a question for the record to see whatever documents you have that document that Exxon, BP, or Shell actually pursued their concerns within your organization as opposed to saying one thing to the public and using your organization to do the opposite. I will follow that up with the question for the record.

Mr. Macchiarola. Senator, to the extent those materials are not proprietary, I am happy to share anything I can to shed some light on a pretty robust policy discussion that again, wants to end up with an outcome that reflects the broad view of the industry, not the view of a specific member. But thank you.

Senator Whitehouse. Thank you, I appreciate it. Thank you, Chairman Braun. I apologize for going three minutes over.

Senator Braun. Senator Carper.

Senator Carper. I was happy to yield my three minutes.

Welcome, one and all, to this hearing. Ironically, this kind of hearing is a timely hearing, it comes on the heels of a weekend, a weekend that I spent in Aspen, at the Aspen Institute Seminar where we had Democrats and Republican House members and a couple of Senators. And we had folks from a couple auto companies and people from all different walks of life and businesses who have an interest in these issues.

In fact, the intersection, if you will, of how do we get cleaner air, cleaner water, address climate change, and create economic opportunity. I am one of those people who believe it is possible to do both. In fact, it is necessary for us to do both.

I am a retired Navy captain, a P-3 aircraft mission commander, Vietnam veteran. Tomorrow morning, in fact, I will be at the Naval Air Station in Jacksonville, Florida with my flight suit on, and go out and fly with a P-8, a new P-8 air crew, and go out and drop some torpedoes into the ocean. Hopefully not too close to Russian submarines, but we will see.

[Laughter.]

Senator Carper. Last weekend, there was a lot of news in Florida, because Miami is flooded again. Again. Not the first time. It won't be the last time. And it is just getting worse. We are not that far away from a place you heard about a lot last year, Ellicott City, Maryland. My wife was just there, went there with some of her friends, just to go on the heels of all the bad weather they had, just to demonstrate some solidarity and help do something for their economy and stay there for a couple of nights and eat in their restaurants.

As you know, they have had two 1,000-year floods in like 18 months. People say, what is a 1,000-year flood? It is something that happens every 1,000 years. They have had two of

them in 18 months. So something is happening. I live in the lowest-lying State in America, Delaware, we are sinking and the seas around us are rising. So this is real for us. And we want to make sure that we address it.

And as it turns out, it is not just enough to do rules and regulations. It is not just enough to rely on innovation. We need to do both. And I say probably once a day, we have to be able to walk and chew gum at the same time. It has probably been said here already. There is an opportunity to do both, and we need to do both.

My sister and I were just barely teenagers and we were driving back from Beckley, West Virginia, where we were born, back to Danville, Virginia, where we were growing up, and my mom was driving in our 1955 Chrysler Plymouth, which was like a tank of a car. We were up mountain roads, and it started raining, bad thunderstorms. She lost control of the car, bounced off a rock cliff on the right side, over to the left side, down the mountainside, over and over and over and over again. Kind of came to a rest, and we were all thrown out of the car, we had no seatbelts. They didn't make seatbelts in most cars, and the auto industry did not receive them warmly when they were pressed to do that.

I love the auto industry. I have worked for years to be supportive of the auto industry. I still go to the Detroit Auto

Show just about every year. We had auto people with us at this last weekend. And I have been working and talking over the last week with Michal Freedhoff, who is a chemist, a Ph.D. chemist, and a member of our EPW staff. Smart as a whip. And we have been talking to representatives from all the major auto industries, auto companies, and asking what we can do to be helpful for them.

They are looking for a certain predictability, I think most businesses look for a certain predictability, that is what they are looking for with respect to fuel efficiency standards. The Obama Administration left in place a rule, regulation that provided very rigorous standards between 2021 and 2025, I think about 5 percent increases a year. What the auto industry is asking, they are not asking to get rid of fuel efficiency standards, they are asking for some near-term flexibility. Maybe 3 percent instead of 5.

And they all wrote a letter to the President about a month or two ago and said, Mr. President, you think you are helping us out by saying we are basically going to align everything, like we did in the 1970s, when we raised fuel efficiency standards, remember CAFE? And we hit the target, 27 and a half miles and then just, we went to nothing more, and we stayed there for like 20 years. Maybe more than 20 years.

And the auto companies said, we don't want to do that, that

is not what we are asking for. They are going to build a lot of electric-powered vehicles, they are going to build hydrogen-powered vehicles. And what we are going to do in this committee and in the legislation that we have reported out to Surface Transportation, is help facilitate, enable them to be successful when they build those vehicles, by providing money for charging stations, electric vehicle fueling stations, hydrogen-powered vehicles. That is part of what we are going to be doing.

And seat belts, catalytic converters, air bags, as much as I love the auto industry, they weren't anxious to do any of those things. And now they advertise their products, how safe they are and all this stuff they used to oppose.

So I just want to, that will be an opening statement, I have an opening statement for the record, Mr. Chairman. But I had to just, that was an audible, as they say in football, that was an audible. So I do have a question or two, if I could, Mr. Chairman.

Senator Braun. Yes.

Senator Carper. Thanks so much. I apologize for being here so late. We had a prayer breakfast in Wilmington, Delaware this morning, and James Lankford from Oklahoma was our guest speaker. It was great.

This would be for Frank, who I think is somebody who's known Mary Frances Repko for a year or two. I am reminded that

every now and then I will hear somebody say in the meeting room, they will say, someone who is my opponent doesn't have to be my enemy.

Mr. Macchiarola. That is absolutely true, Senator.

[Laughter.]

Senator Carper. Might be true with you and MF, I hope so.

In your testimony, you described the investments in innovative air pollution reduction technologies that have been made by your industry. The question goes on to talk about lead, which everyone agrees harms children's brains. One of the six criteria air pollutants referenced in your testimony. The thing is though, getting the lead out of gasoline was not a voluntary measure, as you recall. It was a mandatory EPA rule that was, I think, initially opposed by, I think, by the organization that you represent here today.

I think somebody probably already mentioned this to you before I got here, but I would like to ask, Mr. Chairman, for unanimous consent to insert a copy of the API's testimony opposing EPA's rules to remove lead from gasoline into the record.

[The referenced information follows:]

Senator Carper. And my question would be, do you agree that this phase-out never would have happened if EPA had just left it, or may -- I will say this, it is a better way to ask this question. Would you agree that this phase-out might never have happened or it would have taken a whole lot longer if EPA had just left it up to the industry to get the lead out voluntarily? That is not a trick question, it is just a question from my heart.

Mr. Macchiarola. Yes, thank you for your question, Senator.

It is hard to predict what might have happened, but I certainly take your point that sometimes government action is required to make progress on the environment. We at API support that, we support a wide measure of rulemakings where the government steps in and takes action.

But we also have worked very hard as an industry to commit ourselves to reducing emissions through our own technological advancements and either not waiting for regulation or doing it on top of regulation. I think a perfect example of that is what I spoke of earlier, the environmental partnership, which is a program of large member companies and small companies who join together to share practices and to take action on reducing methane emissions. And the progress in just a short period of time, less than two years, has been remarkable.

The industry, while producing, increasing production since 2006 by more than 50 percent of natural gas, methane emissions have remained flat. That is a recent NOAA study on the industry.

So I do certainly agree with your point that oftentimes, government action is required to make this progress. But we as an industry are committed to reducing emissions through our own activities. Thank you.

Senator Carper. Thank you very, very much, Frank.

Could I just have a minute to ask something of --

Senator Braun. One quick one.

Senator Carper. Thank you -- of Dick Durbin's nephew. Nephew, right? I think.

Cagoule, I could barely spell cagoule a couple of years ago, now I use it a lot. But there used to be a time when we had this hole in the ozone, as you recall. And people tried to figure out what was causing that. It turns out it was chlorofluorinated carbons, and it was coolants out of refrigerators and stuff. So we stopped using those and phased those out and replaced them with HFCs. We find that that is good for the hole in the ozone but not so good for climate change.

So now a number of companies, Honeywell is one of them, Kumars is one of them, these others, American companies, have

developed a follow-on to the HFCs. They are good for the hole in the ozone and good for climate. And we need the Senate to be able to vote to ratify a treaty, it flows out of the Montreal Protocol. There are a bunch of us who want to do it, a bunch of Democrats and Republicans, led largely by our colleagues from Louisiana. Any quick comments on that? And I appreciate your support and the support of the Chamber on this.

Mr. Durbin. Thank you for the question, Senator. Again, I agree with your premise, too, that there are times that the regulation does help move things forward for us in the environmental arena. I do think that the example you presented there on the stratosphere for ozone is an opportunity for us to work together to continue that and make that progress.

Senator Carper. That would be great.

Mr. Chairman, that is a great opportunity for us to work on this stuff together. I hope that we will. We can do both. We need to do both. Thank you all.

Senator Braun. Thank you. It is amazing when time flies when you are on an interesting subject. So to respect everyone's time, I am going to ask a question here of Mr. Wilson and then let the Ranking Member finish up, then I will give a little concluding statement.

When it comes to the whole issue of how, first of all, I believe industry, corporations, are generally footdraggers when

it comes to health care, which I am involved with. I see this sector being a lot more ahead in the game, which, depending on what you think its speed is, might be disappointing. You ought to see how difficult it has been to get the health care industry, which is the largest sector of our economy, to get with it. Very disappointing.

I know that when it comes to the cost of capital and the return on capital, I am a finance guy, I understand how that works, without a pricing mechanism, how much progress do we have to where people are just extrapolating the returns on investment? And if they are not conscious of the climate, and they are not green in nature, is that a mechanism in and of itself that will have impact, hopefully geometrically better than what we have had up to this point?

Mr. Wilson. I want to make sure I understand your question. Are you asking whether it is possible to achieve sufficient reductions without a policy statement?

Senator Braun. I think your answer to that would be no. I am just asking what speed we might see, must for businesses making that calculation, that I am not going to invest here because it is not addressing the major climate issues, and therefore, it would be a return, a poor ROI.

Mr. Wilson. Right.

Senator Braun. Which is basically what you have been

pushing and interested in, since you have been trying to direct capital into a better return, because it is conscious of the issues out there.

Mr. Wilson. That is correct. There are a lot of business reasons why companies may take on climate change as an issue.

Senator Braun. Right.

Mr. Wilson. Number one, obviously, is efficiency. A lot of companies, there was a lot of low-hanging fruit on the table, companies did not have the systems in place to count energy efficiency savings, for example, as a return on investment for a long time. So when we engaged with companies, there was a lot of low-hanging fruit like that that they could take advantage of.

Another benefit of this is, companies are in a competition for talent. And talent these days, especially young people, are very engaged in this issue, I can tell you. I have two children, and they are not of working age yet, but already very engaged on this issue. The example you referenced earlier about Amazon, that began with a movement within the employee base of Amazon to push the company to take greater steps on climate change. So that would be another benefit.

The third, of course, is more consumer interest in these kinds of issues. So for everything from automotive, where there's a much more avid interest in fuel efficiency, to the

food industry, that we engage with a lot, and there is a lot of interest in not only healthier diets, but more sustainable diets as well, which includes, obviously, better meat product, but also moving away from meat to plant-based sources of food.

So there are different reasons why companies may take this as an issue that they have to really think about. However, what we find is that the low-hanging fruit is rapidly diminishing, and companies have gone a long way toward what they can do without a price signal. However, obviously, a better signal would accelerate all of the kinds of business cases that we already see and have already raised with companies.

Senator Braun. Thank you. Senator Whitehouse.

Senator Whitehouse. Thanks very much. I will just offer a concluding thought. First of all, let me thank Dr. Dutton for being here. Science has been warning us for a considerable period of time that this is coming at us. Science kind of provides the headlights for society, giving us a preview of what is coming down the road. For a long time, science has been predicting that the road was going to get pretty damned rough.

But a scientific prediction is a different thing than an actual human experience. And the fossil fuel industry's attacks on science and on its conclusions have kind of fought that science to a standstill, at least during the period when it was just warnings.

Now we have entered the phase where the road is actually really getting rough. And we are seeing this in previously unknown wildlife intensities, and expanding wildfire seasons. We are seeing it in the farming community with vary atypical flooding experiences and very atypical changes in how seasons work, so that crops don't grow the same way.

In my world, the oceans, Ocean State, Rhode Island, we are seeing it with fisheries moving about dramatically. Connecticut and Rhode Island have essentially lost their lobster fisheries, which used to be a pretty big deal. We are seeing it with incredibly obviously measurements of sea level rise, of ocean temperature. Really hard to argue with a thermometer. And of ocean acidification. Any middle school with an aquarium knows how to do a PH test. And PH tests are pretty hard to argue with, too.

So all of this experience is now piling up. In addition, from the economic side, we are starting to see warnings that weren't apparent just a few years ago. So the warnings out of the Bank of England and out of so many other sovereign banks about a carbon asset bubble crash have the full attention of banks, have the full attention of investors, have the full attention of a community that did not take this terribly seriously until recently.

The warnings about a coastal property values crash coming

from not particularly green places like Freddie Mac have the attention of all the business community members whose livelihoods depend on vibrant coastal communities, insurance, real estate, builders, all of that.

So I think what we are at now is a point where for the first time, there are very serious business interests for whom climate change is no longer just a matter of humoring shareholders and customers, but really goes to a potential dramatic hit to their business model. And if you read what Mark Carney at the Bank of England is warning about in terms of a carbon asset bubble crash, even API's corporate members have a lot to fear from a disorderly transition.

Companies that want to put their hands over their ears and say la, la, la, la, la, and not pay any attention through this stand a very good chance of hitting a wall and having a very hard landing. Whereas with some preparation and care, that could be something you could work your way through with some attentive and thoughtful policy changes.

There is a big difference between jumping out of a plane and jumping out of a plane with a parachute. The outcome is very different when you hit the ground.

So even API's members, I think, have an enormous stake in getting this right. And certainly, the chambers do, across a much broader array of industries that the Chamber represents.

So I look forward to continuing this discussion. I look forward to the answers to the questions for the record. In addition to asking to have the Chamber's page about these different levels of membership put into the record, I would also like to have the Chamber's letter of today scorecarding the Senate resolution put into the record.

Then I have three articles, since I raised this issue about the methane, three articles about the fossil fuel industry's performance with respect to methane leakage and flooring. One is a technical presentation, a scientific report called Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain.

The next is yesterday's New York Times story entitled Despite Their Promises, Giant Energy Companies Burn Away Vast Amounts of Natural Gas. And a final one is today's article from Unearthed, whose title is not readily apparent, here we go, Exxon and BP Among Worst for Flaring in U.S. Oil Fields, Despite Green Pledges.

With your permission, Mr. Chairman, I would ask those to be added to the record.

[The referenced information follows:]

Senator Whitehouse. And I thank all the members of the panel for being here today.

Senator Braun. By the way, those will be added to the record, and the record will be open for two weeks for any other submissions.

Very briefly, we are going to use this platform often. I think the other news you may or may not know, but we are going to introduce a climate caucus. I was the first Republican asked to be on it, and was proud to be the first one to say yes. There will be others.

I think this is the defining issue going forward. We just need to figure out how we do it in a way that we can pay for it, that everyone is engaged. And also, how we get the rest of the world involved in doing it.

I think with the conscientious effort and speed you are going to see from this Country, and I am sure that we both share that interest. This hopefully will be the first of many conversations. I want to thank all of you for coming in today to share your thoughts.

With that being said, this hearing is adjourned.

[Whereupon, at 11:34 a.m., the hearing was concluded.]