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U.S. Senate Date: Thursday, September 6, 2018

Committee on Environment  
and Public Works Washington, D.C.

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CLEANING UP THE OCEANS: HOW TO REDUCE THE IMPACT OF MAN-MADE  
TRASH ON THE ENVIRONMENT, WILDLIFE, AND HUMAN HEALTH

Wednesday, September 26, 2018

United States Senate

Committee on Environment and Public Works

Washington, D.C.

The committee met, pursuant to notice, at 10:05 a.m. in room 406, Dirksen Senate Office Building, the Honorable John Barrasso [chairman of the committee] presiding.

Present: Senators Barrasso, Carper, Inhofe, Boozman, Wicker, Fischer, Rounds, Ernst, Sullivan, Cardin, Whitehouse, Gillibrand, Booker, and Van Hollen.

STATEMENT OF THE HONORABLE JOHN BARRASSO, A UNITED STATES  
SENATOR FROM THE STATE OF WYOMING

Senator Barrasso. I call this hearing to order.

Today the Committee will examine the issues of man-made trash that is polluting the oceans, also known as marine debris.

While marine debris can range from metals, glass, rubber, paper, and textiles, the vast majority of marine debris is plastic.

Plastic plays an incredibly important role in our lives. As a doctor, I have seen firsthand how plastic can be indispensable in the field of medicine and healthcare. Similarly, plastic is crucial in virtually every aspect of modern society and economy, including the field of environmental protection. This doesn't mean, of course, that plastics should end up in our rivers, in our lakes, in our streams, and in our oceans.

It is estimated that around 8 million metric tons of plastic waste ends up in the world's oceans each year. While some of this plastic is dumped directly into the ocean, like discarded fishing nets, most of the plastic flows from rivers.

Experts believe that about 90 percent of all plastic pollution flows into the oceans from just ten rivers, eight of which are in Asia. It is estimated that Asia contributes to about 80 percent of all ocean plastic. Specifically, China,

Indonesia, the Philippines, Thailand, and Vietnam are responsible for more plastic pollution than the rest of the world combined.

By now, many Americans have heard of the Great Pacific Garbage Patch. This is an area in the Pacific Ocean where currents have concentrated plastic and other man-made trash. It now stands as the world's largest concentration of marine debris.

Similar debris concentrations exist elsewhere throughout the world. In fact, plastic has been found in almost all corners of the ocean.

Plastic takes at least 450 years to degrade completely; sometimes much longer than that. In the meantime, the debris will continue to entangle and kill marine wildlife, as well as threaten human health. If little is done to stem the accumulation of plastic in the ocean, experts believe that by 2050 there will be more plastic in the ocean than fish, as measured by weight.

Earlier this summer, National Geographic dedicated its June issue to this problem. It is a remarkable cover where it looks like it is an iceberg, but actually it is an upside-down plastic bag. And I don't know who is responsible for this, but Senator Whitehouse and I both had this on our desks in our offices and pointed to this as he and I were talking about another issue.

I think it is a remarkable effort by National Geographic to display in picture form something that we know is a major problem affecting --

Senator Whitehouse. [Comment made off microphone.]

[Laughter.]

Senator Barrasso. I defer to my colleague from Rhode Island.

Senator Whitehouse. Isn't this bipartisanship?

[Laughter.]

Senator Whitehouse. Here is a visual demonstration.

Senator Barrasso. Well, it says, "Some people see ocean plastic as a looming catastrophe worth mentioning in the same breath as climate change." I have it from the plastic standpoint. I am glad, Jonathan, that you, Dr. Baillie, National Geographic's Executive Vice President and Chief Scientist, are able to join us here today.

Environmentalists aren't alone in recognizing this problem. Plastic manufacturers also acknowledge we need to address this problem.

Earlier this summer, another one of our witnesses today, Cal Dooley, announced that he would extend his tenure atop the American Chemistry Council, as he said, to "fight the spread of mismanaged plastic waste and help lay the foundation for a sustained global industry effort to address it." Thank you.

Likewise, Coca-Cola, which is also represented here today and one of the world's biggest producers of plastic bottles, has taken steps to confront the problem. In January this year, Coca-Cola announced that it would "help collect and recycle a bottle or can for every one it sells by 2030."

Today the Committee will want to hear what more can be and should be done. Specifically, we want to know what private industry, what local and State governments, what the Federal Government, and what international institutions should help do to address the crisis.

I would like to point out that today's hearing follows one that Senator Sullivan held as Chairman of the Subcommittee on Fisheries, Water, and Wildlife in May of 2016. It also follows the efforts, as well, as those of Senator Whitehouse to pass the Save Our Seas Act, which I understand is under consideration as we speak.

I want to thank them for their leadership on this issue.

I am going to give each of you an opportunity to say what you would like, a few words, about that after I turn to Ranking Member Carper. This issue is very important to the Ranking Member, to whom I now turn for his opening comments.

[The prepared statement of Senator Barrasso follows:]

STATEMENT OF THE HONORABLE THOMAS R. CARPER, A UNITED STATES  
SENATOR FROM THE STATE OF DELAWARE

Senator Carper. Thanks so much, Mr. Chairman. Thank you very much for holding this hearing.

I really want to say to Sheldon and to Dan, thank you for your wonderful leadership. Thank you for demonstrating how we can work across the aisle on really important issues. I think we are going to make some real progress, including today. So, thank you both.

This is actually a timely issue for us in Delaware. Every year for 31 years we have done something called the Annual Delaware Coastal Cleanup. We start just north of Ocean City, Maryland all the way up to Pennsylvania, about 100 miles, and we pick up trash, all kinds of trash. This is a photograph that was taken at Fox Point State Park, not too far from actually Martha and I live in Wilmington.

We had a lot of kids who showed up. There were scouts and there were people who were just there for a good time and, frankly, for a good cause, and we netted about four tons of trash going up and down the Delaware coast on Saturday.

You might not believe the types of items we cleanup. No, you probably would believe it. From tennis balls, plastic water caps, lip balm containers, a metal baseball bat, and a whole lot more. Four tons is a massive amount of marine debris, and that

is just from one cleanup weekend along Delaware's 100-mile coast.

Those numbers pale in comparison to the amount of trash in our oceans. As the Chairman has already mentioned, the infamous Great Pacific Garbage Patch, the largest mass of marine debris floating in the ocean, is over 300 times the size of Delaware and nearly the size of Alaska.

If you were able to lift Alaska up off the face of the earth and put one end of it on the U.S.-Canadian border, the other end would stretch all the way to Mexico. Imagine that. There is a massive marine debris floating in the ocean that is that big.

As we all know, all this debris has serious impacts on our water quality, on our wildlife, on our food chain, and while the extent of its impacts are not fully known, we know that hundreds of species interact with plastics. Plastic consumption can harm wildlife and all states of life. Recent research suggests it can also decrease reproduction rates. We also know that tiny plastic particles called microplastics may be present in our drinking water and in the food that all of us consume.

Cleanup efforts like the Delaware Coastal Cleanup provide hands-on opportunities for citizens of all ages to learn about this global problem and to contribute to the solution. Not just talk about it, not just worry about it, but to do something

about it. However, most environmental experts agree that stopping debris from ending up in our waters in the first place is more of an urgent priority.

We thank all of our witnesses for coming today. We are going to hear about potential solutions from our esteemed panel this morning.

As Co-Chair and Co-Founder of the Bipartisan Senate Recycling Caucus, along with my Republican partner, Senator John Boozman, I want to mention recycling is one such solution.

Delaware is a little State. It doesn't have a whole lot of space for landfills, so we had to get serious not too long ago about recycling. As governor, I signed two executive orders to improve and promote recycling. The first established a citizens' workgroup on recycling to evaluate recycling in our State. The second established a goal of a 30 percent diversion rate for recyclables from Delaware's solid waste stream.

Delaware's recycling activities continue to grow with the implementation of the universal recycling law in 2010, which eventually led to curbside recycling collection for all single-family households and commercial businesses. These practices work for both our environment and for our economy.

I am proud of our State's work, but while Delaware has made some strides, good strides, other States struggle. I will just say it is a mixed bag. I think we were late to the game. Other

States were a little bit ahead of us. But we are making great strides now. Some other States and communities, frankly, aren't doing their share; they are not doing enough. Maybe we can inspire them.

In many places it is cheaper to dispose of recyclable materials in landfills. These items can then make their way into our waters, unfortunately. This problem worsened when China announced earlier this year that it would no longer accept plastic waste from other countries to convert into new plastic-containing products.

Why is that a big deal? Because China was previously taking 30 percent of U.S. plastic waste for recycling. We, as a nation, will need to invest in better waste management and recycling infrastructure to address challenges like this. We also need to find creative ways to finance these investments. Further, we may want to consider proposals to incentivize the use of recyclable plastics for manufacturing purposes.

All that said, the Federal Government cannot undertake this effort alone. In the last several years, corporations and industry partners have stepped up and really led the way. Good for you.

To our witnesses today testifying on behalf of these partners, we are truly grateful for your work and for the commitments that you have already made to recycling and help

prevent debris from entering our oceans.

Agreeing on solutions and figuring out how to implement them will not be easy, but I am encouraged by the strong bipartisan support and leadership of our two colleagues from Alaska and from Rhode Island. With their continued resolve and with the help of the rest of us, I believe we can put our heads together, put our hands together and make a real difference on this issue, and I look forward to doing so.

Thank you one and all.

[The prepared statement of Senator Carper follows:]

Senator Barrasso. Thank you, Senator Carper.

Senator Sullivan, anything you would like to say?

STATEMENT OF THE HONORABLE DAN SULLIVAN, A UNITED STATES SENATOR  
FROM THE STATE OF ALASKA

Senator Sullivan. Thank you, Mr. Chairman and Ranking Member Carper, for holding this very important hearing today. This is important for the Country, for the world, for Rhode Island, for New Jersey. It is certainly important for my State, Alaska, which has more coastline than the rest of the lower 48 States combined.

The prevalence of marine debris on our shores is a chronic issue. As noted, this marine debris results from a number of man-made sources, including derelict fishing gear, poor solid waste management practices, major storm events, and everyday litter.

But, as the Chairman mentioned, this is a preventable issue. Of the plastics that enter the oceans from land, more than half comes from just five developing countries. In Asia, ten river systems, eight in Asia and two in Africa, contribute almost 90 percent of land-based ocean plastics. To me, this presents a huge opportunity to curb this issue at its source globally.

I want to emphasize what has already been stated, but for the media covering this hearing, hold your breath. This is a fiercely bipartisan issue.

[Laughter.]

Senator Sullivan. It does happen here. Matter of fact, it happens quite a lot. Senator Whitehouse, I am going to talk about all the great work he has done. Senator Booker also has been a huge champion of this.

To just give you a little sense of the work that has been done, this past year, Senator Whitehouse and I have engaged early and often with the EPA, the Commerce Department, the U.S. Trade Representative's Office, the State Department, the American Delegation to the G7, other countries in the G7, countries in the G20; and what has resulted is a growing strong commitment to pursue marine debris prevention goals through future international trade agreements and development aid agreements.

This is an important step forward, actionable step to impact curbing this man-made plight on our oceans that we all agree is a big problem.

Last Congress, Senator Whitehouse and I, in this Committee, as Chair and Ranking Member of the Wildlife Subcommittee, held a hearing on the issue of marine debris. Much of which came out of that hearing is now in our Save Our Seas Act, the SOS Act, which I am happy to report we think is going to be hot-lined and passed today, we hope, in the Senate.

It has already passed once. The House liked it so much they added a bunch of other elements to it, and we are going to

try to repass it again here in the Senate today.

This bill would serve to strengthen the federal response capabilities to marine debris disasters, combat land-based marine debris resources, and encourage interagency coordination in stemming the tide of ocean plastics and, importantly, encourage the Trump Administration to pursue international agreements with regard to this challenge. And I think, talking to the senior members of the Administration, they are already there, so we are hopeful this is going to become law soon.

Senator Whitehouse and I are also talking about an SOS 2.0 bill, and I know Senator Booker is interested in that as well. It is my hope that this hearing will help provide ideas and momentum for the goals on what we think would be a good follow-up bill.

Finally, again in the spirit of bipartisanship, last night I had the honor of presenting the International Conservation Caucus Foundation, the ICCF, Teddy Roosevelt International Conservation Award to Senator Whitehouse at an annual gala event. Although to make sure it stays a little partisan, I was glad to note that this was an award named after one of America's great Republican presidents.

Thank you again, Mr. Chairman, for holding his hearing and giving me an opportunity to speak on this issue. We look forward to a very good, robust discussion today.

[The prepared statement of Senator Sullivan follows:]

Senator Barrasso. Thank you, Senator Sullivan.

Congratulations, Senator Whitehouse. The floor is yours.

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

Senator Whitehouse. Thank you, Chairman Barrasso. I will note that Senator Sullivan, my friend and colleague, was quite restrained last night in his comparisons of the relative size of his State and mine, which I thought was a kindness certainly appreciated by the Senator from Rhode Island.

Let me first thank you, Chairman, for holding this hearing. You and the Ranking Member have been very great to work with. I appreciate your focus on this. It is, I think, a really productive opportunity for us and I am grateful to you.

I want to also thank you and the former Chairman, Senator Inhofe, sitting beside you, because both of you have been able to overcome the disability of living in landlocked States in order to take a very positive interest in the marine debris problem.

I want to particularly thank Senator Inhofe, who became an original co-sponsor of the SOS bill that Dan and I worked on. I appreciate his support and leadership for it. Senator Inhofe is a powerful legislator, and when he puts his shoulder behind something, it tends to happen, so I give him a lot of credit for his support for our Save Our Seas bill.

Senator Sullivan has been an incredible partner in all of this, and I want to pay a lot of respect to him for his work.

We wouldn't have even had the original hearing had Senator Sullivan not been able to successfully negotiate with the Commerce Committee, particularly the Fisheries Subcommittee of the Commerce Committee, to allow this to go forward, because there are turf issues involved.

Fortunately, the chairman of the Fisheries Subcommittee of the Commerce Committee is also Dan Sullivan, so he was able to have that conversation with himself and reach an agreement to go forward in the Environment and Public Works Committee and have that hearing. It is from that hearing that the interest of Senator Inhofe and others was provoked, and from that hearing that the SOS bill went forward.

We do expect that it will pass the Senate by unanimous consent again today, with some of the additions that our friends who see a bill moving want to take an opportunity to add things to. That has been what has slowed it down. It has not been a lack of enthusiasm for the underlying bill; it has been other people saying, wow, something good is happening, let's see if I can get my thing on it.

So it has been a very, very positive experience and Dan's leadership has been phenomenal not only legislatively, but also with pushing really hard on the Administration to make this a policy priority in the Administration. He has been harassing the trade representative, the White House, the Department of

Commerce. He has been very, very energized, and I appreciate that very much.

I also want to express my appreciation to our former colleague in Congress, Cal Dooley, who is here for the American Chemistry Council, and I would like to put into the record the press release that the American Chemistry Council put out when it announced the extension of Mr. Dooley's tenure.

The reason I want to put it into the record is that in one small page it has four separate mentions of how important the American Chemistry Council thinks solving the marine debris problem is and very strong personal statements of commitment and determination by Mr. Dooley, so I think that puts us in a very good opening position.

Senator Barrasso. Without objection, submitted.

[The referenced information follows:]

Senator Whitehouse. We clearly need to do things to clean up our oceans and to clean up the rivers; there are a few of them that are flowing this into our oceans. We have a map here of some of the places around the world which are the top 10 sources, as you will see. They focus on the Pacific, which is one of the reasons that Senator Sullivan has been so strong on this and Senator Murkowski has pledged to work on this through our Oceans Caucus as well.

Senator Carper showed the beach cleanup in Delaware. We do beach cleanups in Rhode Island as well. We do our beach cleanups with trash bags. Senator Sullivan and Senator Murkowski have beach cleanups in Alaska where they have to use front-end loaders, dumpsters, barges because they are on a very, very burdened Pacific coast.

So, it is a few countries and it is a few rivers that are the main sources, and we can do a lot to try to clean that up through trade policy treaties and simple public shaming and friendly persuasion.

We also need to work, and this is where the American Chemistry Council will come in so strongly, on trying to find ways to actually have plastic biodegrade in the oceans. It breaks down into smaller and smaller bits, but it doesn't actually biodegrade into natural elements. It can do that often in a landfill because the composting heat will help it break

down, but in the ocean that doesn't happen; and we need to do research in order to find products that will allow that to happen without undercutting the fundamental value of plastic, which is that it lasts a bit.

We need to worry about entanglements and try to help our fishermen clean up the oceans as they are out there. We see too much marine life dying from ghost fishing gear that still sweeps the ocean and kills, but with no gain to anyone because nobody ever recovers it.

Finally, I think we need to understand the consequences for human health of plastic at the micro level beginning to get into the human diet in a way that the human species has never experienced before through our long history. We have eaten a lot of things through our long history, but it has all been stuff that fundamentally came back to certain natural elements. To have microscopic plastic now in our diet is something new that we need to undertake health research into.

So, I appreciate this going forward and I thank very much my friend, Senator Sullivan, for what a superb leader and partner he has been on this, and I look forward to working with him productively on SOS 2.0, along with all who are present here today. Thank you.

[The prepared statement of Senator Whitehouse follows:]

Senator Barrasso. Thank you very much, Senator Whitehouse, for your leadership.

Thank you, Senator Sullivan.

We now will hear from our witnesses. Today we are joined by four: Dr. Jonathan Baillie, Executive Vice President and Chief Scientist of the National Geographic Society; the Honorable Cal Dooley, President and Chief Executive Officer of the American Chemistry Council; Mr. Bruce Karas, who is Vice President of Environment & Sustainability at Coca-Cola North America; and Dr. Kara Lavender Law, who is Research Professor of Oceanography at the Sea Education Association.

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

I look forward to hearing the testimony and I would like to begin with Dr. Baillie.

STATEMENT OF JONATHAN BAILLIE, EXECUTIVE VICE PRESIDENT AND  
CHIEF SCIENTIST, NATIONAL GEOGRAPHIC SOCIETY

Mr. Baillie. Good morning. Thank you, Chairman Barrasso, Ranking Member Carper, and the distinguished members of the Committee. I would like to thank you for holding this timely hearing on cleaning up the world's oceans. I would also like to congratulate Senator Whitehouse on his award last night. Congratulations.

The Committee's leadership on this global crisis is critical, and I am grateful to have the opportunity to share my expertise as a representative of National Geographic.

I am going to talk about the scale of the crisis; then I am going to discuss the implications for wildlife, for people, and for the economy; and then I am going to close discussing what National Geographic is doing and what we can do better as a Nation.

The use of plastics is rapidly increasing throughout the world and is now a major threat to the environment, to marine species, human health, and the economy. As you can see on this map, over here and over here, the problem of plastics is global, is visible, and it is harmful. But it is also solvable.

Today there are 9.2 billion tons of plastics in this world, and annually we are producing about 500 million tons of plastics, 40 percent of which is just used once and then

discarded. There is estimated to be about 150 million tons of plastics just floating around our oceans and our marine environment, and no one knows really how long it takes for these plastics to biodegrade. Of course, it depends on the particular plastics, but estimates range between 450 years to never.

This leaves our world with an ever-increasing amount of plastic waste. It is a problem we can no longer ignore.

Research indicates that hundreds of marine species consume plastic or become entangled in it. The animals confuse plastic bags or small plastic fragments for food, and it is absolutely devastating to see a sea bird fly in and feed it chick plastic waste unknowingly.

Species face entanglement in plastic packaging such as six-pack rings, as well as ghost nets, fishing nets that have been cut loose or are simply lost.

And we know that plastics have already entered the food chain. Microplastics have been found in 114 aquatic species, more than half of which we actually consume. Organic pollutions also fasten on to these plastic particles. And then there are nanoplastics.

Now, this is concerning, as the full implications are unknown. We, however, do know that plastics are linked to everything from weight gain to brain development impairment in humans.

Now, ocean plastic waste is also a threat to our economy. The ocean supports over 28 million American jobs. One in six U.S. jobs is marine-related. And coastal areas account for 85 percent of the U.S. tourism revenue.

I could give you many more statistics, but it is clear that unchecked plastic pollution poses a major threat to this important component of the U.S. economy.

Now, National Geographic is stepping up. We are using our combined power of our cutting-edge science and exploration and our storytelling to draw attention to this critical issue and to help people understand all over the world what they can do.

In May of 2018, we launched Planet or Plastic?, which has already been referred to. This is a multiyear initiative that is focusing on the plastic crisis and how we can stop single-use plastics entering the oceans. We also give out many awards to explorers around the world, many of which are working on this particular issue, explorers like Heather Koldewey, who is working in the Philippines to help remove these ghost nets from the oceans and have them turned into carpet tiles. It is innovations such as this that we find very encouraging.

Can we please play the film?

[Video played.]

Mr. Baillie. That is just one of our amazing explorers. Heather said there is hope, but not without major change, and

that change has to start right here, right now, in the United States.

We are one of the most developed Nations in the world, and we have to ask ourselves why are we sending over half our plastic recyclables overseas instead of developing our own robust recycling capability? Why do we continue to use multilayer plastics like disposable coffee cups that can't be recycled? And why are we creating recycling standards that reduce confusion and address the fact that 91 percent of recyclable plastic is not being recycled?

Now, while federalism and regulations make addressing this issue challenging, we must shift how our Nation manages plastic design and recapture, a task that only the U.S. Federal Government is able to take on. To support this, National Geographic would like to offer to convene a summit in Washington, D.C. to bring together policymakers, to bring together industry leaders, and to bring together other stakeholders to have a critical discussion about how the U.S. can take a leadership position in this space.

Now, imagine a future where we don't address this solvable issue. Imagine a future with billions of tons of plastics floating around the oceans, the impacts on species, the impacts on people and the economy. This is unthinkable. It is time for us to address this head-on. It is time for bold decisions and

bold action. And it is time for the United States to take a leadership position to demonstrate best practice and to continue to drive innovation.

Thank you.

[The prepared statement of Mr. Baillie follows:]

Senator Barrasso. Thank you so much for your testimony and your leadership on this.

Mr. Dooley.

STATEMENT OF THE HONORABLE CAL DOOLEY, PRESIDENT AND CEO,  
AMERICAN CHEMISTRY COUNCIL

Mr. Dooley. Thank you, Mr. Chairman and members of the Committee. I am delighted to be joining you all.

ACC represents a diverse set of companies engaged in the U.S. business of chemistry, and the chemical industry is at the forefront of developing the innovations, the technologies, and the products that are essential to advancing global environmental sustainability.

If you look at the increased fuel efficiency in our vehicles, they are really a function of the plastics and the composites that are contributing their light-weighting.

When we look at the enhanced energy efficiency of our built environment, our homes, our offices, and our factories, it is the products of chemistry that are increasing their energy efficiency and reducing greenhouse gas emissions. Even when we look at the plastic packaging that is reducing the weight of consumer products, that is reducing emissions.

So, there is a lot of really positive contributions that the products of chemistry are making to enhance sustainability. Unfortunately, we have too many plastics that are entering into the environment where they clearly do not belong.

As many of you already noted, the first step to ending plastic waste in the environment starts with understanding the

sources. Twenty countries account for 83 percent of plastic waste entering into the ocean. The largest sources are rapidly developing economies, mainly in Asia, where basic plastic waste management infrastructure has not kept pace with the rise in demand for consumer goods.

Studies by The World Bank and McKinsey have identified that the most cost-effective investments to reduce plastic waste in the environment are the implementation of waste collection infrastructure and improved processing of collected waste in source countries.

ACC applauds the efforts of Senator Sullivan and Senator Whitehouse for leading efforts to secure the passage of the Save Our Seas Act. It is a good first step.

But ACC and our value chain partners are excited about the opportunity to provide private sector support that would complement a bigger, bolder, and more effective Save Our Seas Act 2.0.

There is a unique opportunity to build bipartisan Congressional and Administration support for increasing the U.S. global leadership in advancing policies that will significantly reduce man-made waste from entering into the environment.

We would encourage your consideration of policies that would include encouraging The World Bank and international development banks and USAID to prioritize waste collection and

management. According to the International Solid Waste Association, waste management accounts for only .3 percent of development aid assistance.

We also would encourage promotion of public-private partnerships and business-led efforts to fund waste management in the developing world. We encourage the Department of Defense and other agencies to fund waste management pilot projects at their facilities, particularly in the Asia Pacific region, to transform plastic waste into fuels, feedstocks, and infrastructure materials.

In addition to policies designed to reduce waste in the developing world, there are domestic policies that can enhance waste management systems in the U.S. and also contribute to the development and implementation of new technologies that can capture the value in plastic waste. Plastic waste has more captured energy than coal, and many of ACC's companies are investing in developing technologies that can unlock the captured energy, transforming non-recycled plastics into alternative fuels and feedstock materials for new manufacturing. But current regulations do not specifically recognize these emerging technologies as recycling, which is an impediment to capturing the value of plastic waste.

Some specific opportunities to address this issue include: providing guidance to States recognizing pyrolysis and

gasification facilities which take waste plastics and convert them back to chemicals or fuels as manufacturing and not hazardous waste facilities; revise EPA's guidelines for the assessment of environmental performance standards and equal labels for federal procurement to prefer products and services that utilize recovered plastics as recycled content; partner with the Department of Energy and Department of Transportation and other appropriate agencies to research opportunities that utilize plastic waste and innovative construction materials in transportation and water infrastructure projects nationwide; and, finally, designating fuel derived from plastic waste as a renewable fuel.

We have a great opportunity to create a global public-private initiative to eliminate man-made waste in the environment. ACC and our partners in the plastic value chain are committed to working with you and environmental organizations to identify the policies and the most cost-effective investments of public and private resources that will eliminate man-made waste from entering into the environment.

Thank you.

[The prepared statement of Mr. Dooley follows:]

Senator Barrasso. Thank you so much for your testimony,  
Mr. Dooley.

Mr. Karas.

STATEMENT OF BRUCE KARAS, PRESIDENT OF ENVIRONMENT AND  
SUSTAINABILITY, COCA-COLA NORTH AMERICA

Mr. Karas. Chairman Barrasso, Ranking Member Carper, and members of the Committee, thank you for the opportunity for inviting me before you to discuss the very issue of marine debris.

Our world has a waste problem. According to the Ocean Conservancy, scientists estimate that more than 8 million metric tons of plastic is entering our ocean every year. From our perspective, it is unacceptable that packaging ends up in the wrong place, in our oceans and waterways or littering the communities where we work and live.

As a total beverage company, we bring people drinks that make life's everyday moments more enjoying, create a shared opportunity for people and communities we call home. While growth is important, we cannot grow at any cost. We believe in doing business the right way, not just the easy way. For us, that means continuously working to reduce our environmental impact by collecting and recycling our packaging footprint, providing access to clean drinking water, supporting women's economic empowerment, and strengthening local communities.

We are a global company operating in more than 200 countries and territories, but through our bottling partners we also have deep, local connections and relationships that offer a

unique ability to make a meaningful difference. The key areas where we strive to lead are clean, sustainable water for communities and women's economic empowerment.

A third area we launched just this year is our new packaging vision, World Without Waste. The goal is to rethink how bottles and cans are designed and made, as well as how they are recycled and repurposed. The centerpiece is a bold, ambitious goal to help collect and recycle the equivalent of every bottle or can we sell globally by 2030. The Coca-Cola system intends to back World Without Waste with a multiyear investment that augments ongoing work to make our packaging 100 percent recyclable by 2025.

When it comes to PET, we believe that every package has value and a life beyond its initial use, and should be collected and recycled into either a new package or another beneficial use. We aim to be part of collaborative solutions that prevent waste from getting to the ocean in the first place.

Regardless of where it comes from, we want our packages to have more than one life. To date, all 17 of our geographic business units have developed local plans to address our three strategic pillars: design, collect, and partner.

Design means we aspire to create packaging that is at least 50 percent recycled material by 2030; continue working to make all consumer packaging 100 percent recyclable by 2025.

Collect means to collect and recycle the equivalent of 100 percent of the primary packaging we sell by 2030. Partner means we will work together to support a healthy debris-free environment at both the land and the sea.

In the context of design, our research and development team is working with chemical recycling technologies towards future piloting or partnerships. Additionally, our procurement team is working with our suppliers to advance progress on and increase availability of recycled PET, known as rPET.

In Mexico, our bottled water brand seal is now available in 100 percent rPET bottle as a result of strong collection and conversion infrastructure that our system has partnered in over the past decade. We are also looking at 100 percent rPET bottle in the Hong Kong market later this year. We will pilot the use of rPET in several other Asia Pacific markets in 2019. The increased use of rPET is crucial to accelerate a transition to a true circular economy for plastics.

In the innovation space, we have expanded our package-less delivery model for beverages with both our freestyle touchscreen operated dispenser and our innovative Dasani pure fill.

In the context of collect, marine plastic is driven in larger part by limited collection and waste management infrastructure in many emerging markets. That is why our second strategic pillar centers on improving packaging collection.

We are working around the world to have an up-to-date understanding of collection recycling data and approaches. Where systems do not exist is where we are focusing. Cities with a very active informal sector, like unofficial, small-scale businesses, have high rates of collection. There are correspondingly lower rates of collection for recycling in more developed cities where there is less incentive for small-scale collectors.

We will use the data we collect to partner with government, industry, civil society, and local communities to tailor, co-create, and roll out the type of collection recycling models that have been successful in developing markets in other parts of the world and scalable models that will improve collection rates.

Last is partner. We recognize that although we are part of a problem, we cannot solve the packaging waste problem alone. It is for that reason we have established, joined, and expanded cross-sectoral partnerships around the world. We intend to do all of this not just in a cross-sector way, but in a scalable way that drives systemic change.

We are working with groups from the international level to the very local level, from the Ocean Conservancy Trash for Seas Alliance, the Ellen MacArthur Foundation, to the Closed Loop Fund and local chambers of commerce.

Thank you for your time. I look forward to answering your questions.

[The prepared statement of Mr. Karas follows:]

Senator Barrasso. Thank you very much, Mr. Karas.

Dr. Law.

STATEMENT OF KARA LAVENDER LAW, RESEARCH PROFESSOR OF  
OCEANOGRAPHY, SEA EDUCATION ASSOCIATION

Ms. Law. Good morning. Thank you, Chairman Barrasso, Ranking Member Carper, and members of the Committee for the invitation to testify at this important hearing on man-made debris in the marine environment. My name is Dr. Kara Lavender Law, and I am a Research Professor of Oceanography at Sea Education Association, or SEA.

Since 1971, SEA has taken undergraduate students to sea on tall sailing ships to study the open ocean firsthand as navigators, sailors, shipmates, and scientists. More than 8,000 SEA semester students, some of whom are in the room today, have contributed to our 30-plus year data set on floating plastics in the ocean, assembled by towing plankton nets from our sailing research ships twice a day, every day, and hand-counting their contents.

Trained in ocean physics, I first learned about ocean plastics in 2003, when I joined SEA, where the distribution of floating plastic debris was common knowledge based upon decades of student research. In contrast to misconceptions about immense floating islands of recognizable items of plastic trash, often referred to as garbage patches, SEA scientists knew that the most numerous type of plastic debris are microplastics, particles smaller than your pinky fingernail that are not

readily visible even from the deck of a ship. I have a sample here.

Since 2010, I have carried out scientific research on ocean plastics to better understand their sources, abundance, distribution, and transformation in the marine environment not only to advance scientific understanding, but also to inform solutions to this global problem.

Of all the man-made debris in the marine environment, we focus on plastics because of their ubiquity, persistence, and the risks they pose to wildlife and, potentially, human health. To date, widespread encounters of more than 800 species of marine wildlife with plastic debris have been well documented, and scientific evidence clearly demonstrates physical harm that can lead to death of individuals from entanglement or ingestion of large debris.

Laboratory studies have also provided evidence of harm from animal uptake of microplastics and their associated chemicals. However, because experiments are carefully controlled to test single outcomes, it is impossible to generalize results across species of debris types, or from the laboratory to populations in nature. Further research into the ecological impacts of contamination by microplastics is sorely needed.

However, we must not wait for all scientific questions to be comprehensively and definitively answered before taking

action to eliminate plastic debris from our oceans. In the short-term, the most important action is to stop uncontained plastic waste from entering the ocean from land.

It is estimated that of the 5 to 13 million metric tons of plastic trash entering the ocean annually, nearly half originates from four countries in Southeast Asia, where inadequate infrastructure cannot keep pace with the rapidly increasing waste generation.

However, here in the United States, the amount of plastic waste generated per capita outranks that in each of those four Southeast Asian countries, and the amount of plastic waste generated each day in the coastal United States is the highest of any country in the world.

In the U.S. we are fortunate to also have a robust waste management system. But even the relatively small amount of waste that is accidentally lost or intentionally littered adds up to a large amount available to enter the ocean. Global investment in waste management, especially where no formal system currently exists, but even where it does, is the first line of defense in keeping trash out of the ocean.

Cleaning up litter on land, especially in rivers and on coastlines, will continue to be an important "last chance" strategy to capture waste before it enters the ocean. Cleaning up debris in the sea itself is more challenging and resource-

intensive, but can be effective when targeting large items in nearshore areas or collecting floating trash before it can move offshore and break apart into millions of microplastics.

Waste collection and cleanups are imperative in the short-term, but long-term sustainable solutions to ocean plastics pollution must address the increasing amounts of plastics in use. We must act to eliminate unnecessary usage and waste; increase demand for recovering and recycling, perhaps through product design that ensures material value at the end of product life; and identify suitable material alternatives where possible.

In summary, to reduce the impact of man-made trash on the oceans, wildlife, and human health, it is imperative that we prevent debris, especially that made of plastics, from entering the ocean. There is an immediate and critical need to assist countries that have inadequate waste management systems and there is much more to do in our own communities here in the U.S. as well.

No matter where in the world we choose to work, a necessary first step is to clearly identify and measure the local sources of ocean debris, as well as the drivers behind each source, which could be a lack of infrastructure, a consequence of product design or use, or factors influencing human behavior. With this information in hand, we can best focus our time,

attention, and resources to design appropriate interventions that will reduce input from each source. These actions should always be appropriate to place. There is no silver bullet or one-size-fits-all solution.

Ocean plastics pollution is an environmental problem that is global in scope, in impact, and in responsibility. We all have a stake in a clean and healthy ocean. Whether in towns, cities, or States in the United States, or through international partnerships, we must work together towards short-term and long-term solutions.

Thank you for the opportunity to testify. I look forward to the day when our oceans are clean because of the work we have accomplished together.

[The prepared statement of Ms. Law follows:]

Senator Barrasso. Well, thank you all for your testimony. Very thoughtful, very insightful.

We are going to start with some questioning. I am going to ask each of you, and maybe we want to start with Dr. Law and then work down the panel. You talked about training in ocean physics, undergraduate degree in math. Obviously, very thoughtful on these topics.

There are a couple of articles that were in The Economist that ran two weeks ago on this specific topic, in the science and technology section. One was entitled "On the Plastic Highway." Road makers are using waste to create harder wearing surfaces, the idea of using some of the recyclables not just for some of the things that you mentioned, Dr. Baillie, but actually for hardened surfaces on the roads.

The second title, which made me think to start with you, was a teenager in California. This article is called "Sweeping the Ocean: A Teenager's Plan to Troll for Plastic in the North Pacific Becomes Reality," and you are familiar with what he is doing out there.

I would like each of you to describe what you think are some of the most promising areas of innovation that are taking place right now. And if it is okay, we can start with you, Dr. Law.

Ms. Law. Sure. Thank you for the question. I actually

think that some of the most promising innovations and interventions are actually quite simple. So, thinking about communities in the United States, in Portland, Maine, where I live, there has been an initiative to replace open garbage cans with lidded garbage cans. So, this is a way that we simply prevent waste from blowing out on a windy day.

In Baltimore there is a river trash catching device called Mr. Trash Wheel that captures litter that is floating down the river before it can enter the ocean.

These are relatively simple interventions. Mr. Trash Wheel runs on solar and hydropower, and actually has a great personality if you follow his Twitter feed. So, raising awareness, as well.

Senator Barrasso. You are paying close attention to the personality.

Senator Whitehouse. Mr. Trash Wheel. Okay.

Senator Barrasso. Let the record reflect.

Ms. Law. So, I think these innovations are critical because those are acting to trap the trash before it enters the environment and ultimately the ocean.

I think it is laudable that we are thinking big about trying to clean up the open ocean, but I have some concerns about trying to go out in the middle of the ocean to collect particles, most of which are as small as those found in this

little vial. So, I do applaud all kinds of innovation and hope people will continue thinking big about how to solve this problem.

Senator Barrasso. Mr. Karas?

Mr. Karas. It is a great question. I think in the area of innovation, one of the things to consider is really thinking about innovation in process, how we do things. At least where we sit, as a company that makes beverages, it is very challenging for us to even get PET plastic back into our packages. So, we have partnered with groups like the Closed Loop Fund, which is focused on innovative solutions and they have done some great things in different geographies, basically applying technology to enhance the collection and recycling of materials.

I think we have looked at things like the water wheel. We have looked at partnering with aquariums on different innovations like that. The key is how can you get close to the source of generation, and the innovation would be how do you recycle better.

We can do carts in the street, and we work with the Recycling Partnership. We have a coastal communities grant that we had with the Recycling Partnership, exactly as you talked about in Portland. So, we are learning, as a company, what are some of those next steps that we can take that would be

innovations that would improve collection, recycling.

But I would say what we see where we sit today is the recycling infrastructure is very challenging for us to negotiate even in the U.S. It is a combination of privately owned companies, small municipalities, and each one is a little bit separated. What we would like to see longer term is really thinking through what is the waste infrastructure 2.0. What does it need to be to properly collect materials? And then you enable end markets to really function properly.

Senator Barrasso. Mr. Dooley?

Mr. Dooley. Thank you, Mr. Chairman. What I guess I would start off is that there is not one silver bullet that will solve this issue. But one of the things I think is very, very important is how do you establish policies that will result in adding value to the waste stream. And by that I mean how can you see an incentive for the investment in technologies that can ensure that waste plastic is more easily recyclable or the captured energy is more recoverable.

How do you ensure, too, that there could be added value by finding new uses and applications of that plastic waste stream, as you mentioned, in terms of enhancing the infrastructure, the asphalt, and adding, even actually enhancing performance attributes there.

That is where I think there are some simple things that

Congress could do that would not treat the plastic waste and the recovery of it as a hazardous waste, because that is stemming the flow of investment dollars and the development of new technologies that could advance the value of that waste stream and recapture some of the value.

A lot of our companies are making investments in pyrolysis. Actually, one company is about ready to launch, where they can take a mixed plastic waste stream that they can break down, run it through pyrolysis, basically, and break it down into a new feedstock that can be recycled into the plastic manufacturing and conversion stream.

Senator Barrasso. I will get to you in a second, Mr. Baillie, to answer that same question.

I think, Mr. Dooley, in your comments you earlier talked about a public-private partnership. There has to be a profit motive for this, and some of these new advances may lead right to that, it sounds like.

Mr. Dooley. Absolutely. If you increase the value of it, you are going to have individuals be more willing to play a role in recovering, picking it up. You could have more incentives for the investment in water wheels in the developing world if there was a greater value to it. National Geographic is doing a lot of work looking at these scalable technologies as well, which we are very supportive of the work they are doing there.

Senator Barrasso. Well, then, to National Geographic. Mr. Baillie.

Mr. Baillie. Thank you. We have been thinking a lot about innovation and we have actually developed an impact investing fund with Sky. We have also developed a number of global challenges which we will be launching to promote innovation.

In our community, we have some interesting projects which are being developed. The one I highlighted there with Heather Koldewey is very interesting, where you take nets from the ocean, which are basically floating around and capturing and killing a broad range of species. The local community benefits, but then we also get a recycled product in the end, so it is an interesting win-win-win scenario.

We also have other explorers that are working on technology to take plastics locally and then convert that into building materials that people can actually use.

In addition to that, we have another woman we are working with who is taking plastics that can't be recycled and looking at how that can be converted into fuel.

So, there are lots of exciting things on the horizon, but I would agree with my colleagues that the greatest innovation is more about process and it is more about incentives. Here in Washington, D.C., the five-cent charge on bags made a world of difference, so why don't we have that across the entire United

States? Norway has 90 percent of its bottles being recycled with a simple incentive program around that.

We are behind, actually, China and Europe in recycling, so let's look to the others. We are about 9 percent of our plastics being recycled. Let's look to the others and see these basic measures that we can put in place first, and then make sure that that innovation catches up with us as we move forward.

Senator Barrasso. Thank you.

Senator Van Hollen.

Senator Van Hollen. Thank you, Mr. Chairman, for holding this hearing.

It is great to see all of you.

I want to commend my colleagues, Senators Sullivan and Whitehouse, for the SOS Act. I heard you, Mr. Chairman, say we might pass that by unanimous consent today. I am proud to be a co-sponsor.

Great to see Cal Dooley. We served together in the House.

So, as I see it and listening to the testimony, we have to do a couple things. Number one, we try and reduce upfront the amount of plastic packaging; number two, we need to significantly increase our recycling and improve our waste management, and not just here at home, but as has been discussed, you have major sources overseas.

Dr. Law, thank you for giving a shout out to Mr. Trash

Wheel. Baltimore is home to the National Aquarium, and the Aquarium works hard to try to educate people throughout the Country and around the world about the importance of protecting our environment and ocean environment.

I should say that since we gave a shout out to Mr. Trash Wheel in the Baltimore Harbor, Canton, Maryland has Professor Trash Wheel. These are actually really important innovations to try and prevent trash that does get into our waterways and rivers from going out into the Chesapeake Bay and, of course, ultimately into the ocean. So, we want to prevent it from getting into rivers in the first place, but, when they get there, it is easier to catch it there than when it disburses.

My question really relates to some of the testimony we have heard this morning on how plastics, as it breaks down, can get into the food chain.

There was a story in Science Alert that just came out a few days ago, September 22nd, saying that plastic pollution is now spreading from ocean food chains to land mammals via mosquitos. I don't know if you saw that article.

Dr. Baillie, you say in your written testimony here, "Research has demonstrated that many of the fish and shellfish humans eat are consuming microplastics. It has also tied plastics to issues ranging from weight gain to brain development impairment."

So, if our two doctors here today could comment on the issue of plastics breaking down into microplastics and getting into the food chain, the animal food chain, and then what risk is there currently to the human food chain?

Ms. Law. Thank you for the question. So, scientific studies have indeed found contamination by microplastics in a wide variety of species who have ingested them, and when you look at the size of these particles, you can see how we can be entering the bottom of the food chain.

When we look at the percentage of individual animals that have microplastics when they are captured, the percentage may be around 20 or 30 percent, but this can add up if we eat a lot of seafood. Of course, it depends on the animal. We eat invertebrates whole, so if there is plastic in the invertebrate, we will be eating that. If it is a fish, likely, the plastics are in the gut, and we don't typically eat the guts of those animals.

I think there is reason to be concerned, of course, because the amount of plastics that we are producing that are leaking into the ocean are going up over time, so the amounts we may ingest can go up over time as well. But there is so much remaining to be learned about what actually happens when an animal eats plastic or when a human eats plastic, including how long is it spending in the body. Are chemicals transferring

from those particles to the organism? Do those chemicals bioaccumulate? And we simply don't have those answers yet.

One thing to consider, there was one study looking at plastics ingestion in invertebrates, I believe, mussels or shellfish, and, as a side part of the study, they put out a Petri dish at a typical dinner table, and the number of plastic particles that landed in that Petri dish, sort of equivalent to on your dinner place, was much higher than what was in the seafood itself.

So, I think we need to think beyond just seafood. Think about our drinking water, our bottled water, sea salt, all these other studies that are finding microplastics far beyond just the fish and shellfish.

Mr. Baillie. I would agree with all of that. With the number of plastics increasing in the oceans, we are going to see more and more of this. There is plastics breaking down into their tiny fragments, but then there are nanoplastics as well; and the science is at a very early stage in terms of understanding the implications, but we do know with these plastics that the organic pollutants do bind with them in the ocean, which will probably make things even worse.

But even if it turned out that there wasn't major implications for our health, which I don't think will be the case, I don't think future generations will be grateful for

having plastics as a large part of their diet.

Senator Van Hollen. I agree. I just wanted to get the most recent state of the science on this, as I said.

Mr. Chairman, if I could ask unanimous consent to put in the record the article that appeared recently, because my understanding is, as you said, in fish, plastics seem to concentrate in the gut. But if you have mosquitos, then passing this on to land mammals, then there are questions about the food chain there. But there are all sorts of reasons to try and want to reduce this huge volume of trash. Obviously, this is one of them.

Thank you.

Senator Barrasso. Without objection, it is entered into the record.

[The referenced information follows:]

Senator Barrasso. Senator Ernst.

Senator Ernst. Thank you, Mr. Chair. I appreciate the discussion today. I think a number of us are in and out, but it does tend to be a very bipartisan issue, so I want to thank you all very much for being here.

Mr. Dooley, a lot of the testimony that we have heard today has been about how to better manage the plastic waste that ends up in our oceans. However, I also think it is important to touch on the work being done to make plastic more eco-friendly. I think a number of us have discussed this before.

The Iowa Corn Promotion Board was one of the first groups to fund research on polylactic acid, PLA, which is compostable and made from corn; and PLA is the most widely used bioplastic and is used to make straws, cups, plates, cutlery, and other items. After composting, PLA doesn't contain any hazardous byproducts that we see from other plastics and doesn't release toxic chemicals into the environment.

Though advancements will need to be made for PLA to become more widely used, do you see that PLA or other bio-based plastics could be part of the solution to the problem that we are facing right now?

Mr. Dooley. Yes. Thank you. Like I said before, there is not going to be one silver bullet, and what you have identified is where there is going to be an opportunity, and our companies

are investing a lot of money in research and development of some of the biodegradable plastic alternatives that are out there.

We have to, though, be also concerned in terms of making sure that we do a comprehensive evaluation in terms of how that can be managed through the waste stream as well, because some of these compostable plastics can also contaminate the recycling, the more traditional and other plastic waste streams as well. So it has a role in the marketplace and it is where we see a lot of investment going into.

There is also an increasing demand, as Bruce said in terms of Coca-Cola, with an increased demand that they are making a commitment to 50 percent recycled content. That, again, is going to add value to that plastic waste stream. The industry, the resin producers and the plastic producers, have to do a better job in investing the technology that facilitates the recovery of this material so that it can go more easily into that recycled content. So that is also going to be a component.

But we have to be careful that we don't go down a path that goes all to biodegradable that then when a consumer or a homeowner mixes it into the recycling bin and then it creates another sorting opportunity and, if not sorted appropriately, then it contaminates the recycled material that some of the consumer product companies need.

Senator Ernst. And we obviously know that there is a

multi-pronged approach to really wrangling with this issue, so certainly I think that composting type products should be part of that discussion.

But then would you all agree maybe then that we need to be looking at additional research and development opportunities for all of these? I think opportunities really is there. With Iowa and the resources that we have, many of our other States as well, through the various commodities that we have, we can produce a number of those types of materials, and that might be one part of the solution, and I do hope that we will take an opportunity to look at that.

Any other comments on those biodegradables?

Mr. Baillie. I would just add, and maybe to build on what Cal had mentioned, is I think as we design things for use and they are plastic, you have to design with the end in mind. I think one of the reasons why we are where we are today is many plastics are designed to -- a bag is designed to carry materials, but the thought isn't given to the end market, and I think that is a key piece of development in the process, is understanding what we are building and does it actually have value later.

If it has value, it is going to come back and create that circular economy that we want. But if it is very difficult to recycle, we don't have technologies, as Cal mentioned, to

actually solve for, then that is when we run into problems. So really focusing on making sure we design with the end use in mind when we make things.

Senator Ernest. Absolutely. I think that is very smart. So looking at, perhaps, straws, there is the big debate about plastic straws right now, how many plastic straws are actually recycled. I don't know that many of those are, so that could be a potential stream or opportunity for something that is biodegradable and something that would be composted in a landfill, perhaps. So I think that is a very smart approach, is understanding what is recoverable later on and what is actually put into our landfill system.

Did you have a comment as well, Dr. Lavender Law?

Ms. Law. Yes. Thank you for bringing up straws, because I think that is a really good example of if we don't need a straw, not creating the waste in the first place is actually a higher level strategy so that we don't even have to worry about managing it.

But from the perspective of the oceans, I just wanted to comment on the biodegradable plastics as well. Specifically, the PLA is designed to biodegrade in an industrial composting facility.

Senator Ernst. Composting, correct.

Ms. Law. So, if you are in a municipality that doesn't

have access to one of those facilities, your PLA is trash, and the ocean doesn't really care if it is PLA or polyethylene or polypropylene. So that is something just to keep in mind when we talk. We talk broadly about these materials, but really we need to think carefully about which specific material we are talking about.

Senator Ernst. Right. Exactly. I will make another plug for it, though. With the PLAs, we still do have to look at other research and development, and understanding where perhaps this particular stream of PLA may not be appropriate for oceans, but certainly if there is additional research that can be done that does support another biodegradable product that is ocean-friendly, we certainly should be looking at all those opportunities.

So, thank you. Oh, excuse me, yes, Dr. Baillie.

Mr. Baillie. Just on the straws, Americans are using 500 million straws every day, and there are alternatives. You can use a straw like this and keep it with you at all times. But with a lot of these plastic items that we simply don't need, there is an opportunity to take leadership and just say we are going to ban certain items. You have the French, which have made a commitment to banning plastic cups and plates by 2020. You have many countries that have banned the use of plastic bags. We have about a trillion plastic bags per year being

produced. While I gave my testimony, I think about 10 million plastic bags were used, with an average lifespan of about 15 minutes.

So, there are many kinds of interventions that we can make immediately if we are truly serious about addressing the small waste issues like straws.

Senator Ernst. Well, I appreciate it.

Thank you very much, Mr. Chair.

Senator Barrasso. Thank you, Senator Ernst.

Senator Whitehouse.

Senator Whitehouse. Thank you, Chairman, and thank you again to you for this hearing and to the witnesses for appearing here.

In my opening comments I mentioned a couple of topic areas. One is cleaning up in the oceans, and particularly cleaning up in the rivers that feed the oceans, where much of this plastic comes downriver; trying to find ways to pick the plastic out of the flow points before it hits the ocean. Once it is out there floating around in the great Pacific Garbage Patch, it is really hard, really inefficient, really expensive to deal with it. To try to get it upstream is more significant.

I think to prevent that we need to have a strong focus on requiring countries with whom we have trade relationships to meet elementary standards of upland waste disposal

responsibility. We have never been very good at enforcing pollution control standards overseas as a part of trying to balance our trade, so there has been a lot of cheating, where an American company has to keep its junk out of the river and the competitor doesn't, so the price of the competitor's product can go down, but we all pay the price when it ends up in the ocean.

And I think there are technical ways to go about doing that. Even in Newport Harbor we have a little basically a sunk dumpster with a solar pump that keeps pumping the water out so that there is constant inflow and there is enough inflow the plastic flows in, it gets trapped in the dumpster and you can clear it out.

Rivers have similar catchment technologies. But until there is a revenue basis for doing that, it is hard to get it done, so that is something I think that we can work on.

Biodegradability we have talked about, so I don't need to add to that.

Again, on entanglement, if a fisherman loses a long-line rig, for instance, first of all, it may be hard to find, but it is not really hard to put pingers on things these days. Supporting people in trying to make fishing gear more traceable once it is lost could be a good strategy. Having a bounty so that if you are out fishing and you come across somebody's gear, you take the trouble to bring it in and bring it home and take

it out of the ocean.

Fisherman work incredibly hard and it is a very uncertain world out there. It is even more uncertain with oceans warming and populations of fish moving around, so to expect fishermen to stop what they are doing and become the people who are responsible for cleaning the oceans themselves I don't think is really fair unless all of us have found a way to help make that a productive use of their time.

And then I think the human health research is the other point. We really, I think, need to know pretty quickly what risks this poses so we can know with what degree of urgency and alacrity we need to take on the problem.

So, I would just like to ask each of you to comment on those four topic areas for our 2.0, and if there is anything further you think I have completely missed, please throw it in.

We will start with Dr. Baillie. This will be my only question, so if we could just run it out, that would be fine.

Mr. Baillie. Sure. So, on the initial map that I showed, it showed the major river systems where plastic pollutants are getting into the oceans and, of course, you commented on the top 20 being in Asia and being a significant problem.

At National Geographic we are committed to doing an exploration looking at some of the major rivers around the world and understanding where the plastics are actually coming from

and looking at the social issues and the political issues, but also looking at innovation that we can help promote so that that process can be addressed.

When it comes to fishing gear, you saw the short video in terms of using the nets. It would be wonderful if we could look at creating more of a market for those nets, as many of them are made of nylon, which is actually quite a valuable material that can be reused for things like the carpet tile right here. So, I think it is about exploring some of those innovative approaches, but also putting more pressure on the fishermen to actually keep track of those nets when they are out there.

I very much like your idea of the tracking device. Again, at National Geographic, we are developing a whole bunch of sensor systems, so this is just the type of thing we could explore, sensors to try and keep greater tracking.

Mr. Dooley. Thank you. You know, I think that what we are interested in and we are trying again to really establish a private sector initiative that would represent constituents throughout the value chain. Part of our interest is how do we do a better job of identifying those initiatives and those investments that are going to be the most cost-effective in making a meaningful impact on reducing plastic waste in the environment.

We think the public agencies, the U.S. Government, has an

opportunity to help and facilitate that as well.

I think when we look at, again, the Asia region, which is the primary source for certainly the Pacific driver, we have the opportunity to focus on cities. Ocean Conservancy has just launched an initiative called Cities, and cities on rivers, because, as you said, the rivers are the source that enters into the ocean. If we focus on developing a comprehensive waste management assistance program for cities on rivers in the Asia region, I think you would be able to see significant private sector resources that would complement public sector investments as well.

You can even get that a little more granular because you also, in order to have a sustainable waste management system, you have to add more value to that waste stream; and that is where I think the U.S. Government also has an opportunity to make investments in pilot programs in that region. We have a number of military bases there that could make an investment in a pilot program that could be able to demonstrate and capture the value in the waste stream not only from their own operations, but perhaps even extend it to the communities.

You can even see it with fishing nets. If you had a pyrolysis unit that could develop syn fuel or diesel fuel from a plastic waste stream, as well as fishing nets, it could be a source of income for the local community that was playing a

major role in trying to be a collection center or providing the collection of unused fishing nets.

So we think that there is just a wonderful opportunity for the U.S. to show leadership that would complement and encourage private sector involvement in meaningful initiatives that really focus on making waste management more effective.

Senator Whitehouse. My time has long expired, so I should probably invite the other two witnesses to make their responses for the record, if you would do that.

It is up to the discretion of the Chair, but I think we probably need to be thinking about bounties, as well, because I doubt there is enough of a resource there to make it self-sustaining without some help.

Senator Barrasso. Senator Inhofe.

Senator Inhofe. Thank you, Mr. Chairman.

Senator Whitehouse, you opened your great comments about the fact that we don't have the control over some of the foreign countries that we would otherwise have. I want to give another side to that because in some of these countries they actually have ideas that we haven't gotten. One of my close friends on the continent of Africa is Paul Kagame, who is head of Rwanda. He made a decision to really clean up his country. And I have to tell you guys that of all 54 countries, and I have been to all of them, in Africa, you go in there, that is the clean,

pristine country, Rwanda.

Don't get me wrong on this, I am not suggesting this, Mr. Karas, but the first thing he did was outlaw plastic bags. Then he went on. Now when you go from the airport to the headquarters, you just see a pristine country. I think we ought to really sit down and look and see some of the things that he has done successfully and emulate those.

I am kind of surprised not many people talked about the meeting that took place just last week. Maybe it is because it is so soon afterwards, but it was in Nova Scotia, where the G7 people, and our participant there, of course, was Andrew Wheeler, who worked for me for 14 years, who was very active on this Committee. He attended that. It was a meeting where they discussed the very thing that we are discussing here.

The objective, and I am going to read this and then I am going to be asking to put the outline in the record, is to "incentive the development of innovative social and technological solutions for a more sustainable management of plastics throughout their life cycle in order to increase resource efficiency and to reduce marine plastic pollution, including by finding innovative ways to enhance waste management of plastics that may become marine litter."

They have excellent suggestions, and I ask, at this point in the record, you include this. With no objection. Thank you.

[The referenced information follows:]

Senator Inhofe. I would ask you, Mr. Dooley, I think you are familiar with this. Nothing much has been said about this, but I would like to know what thoughts you have about the recommendations that have come from the G7 talks that took place. Actually, that meeting took place in Nova Scotia right up until last Saturday, I think they concluded it, so your thoughts about what has happened there and how that coordinates with the recommendations that we are making with this excellent panel that we have.

Mr. Dooley. Well, ACC was very pleased that Administrator Wheeler attended that meeting and also committed, along with the balance of the environmental ministers there, to really support moving forward on how could they collectively create greater incentives for the development of innovations that would contribute to the elimination of plastic waste.

It really was building upon one of the commitments that Trudeau made at the G7 principals meeting, where he committed to doing \$100 million innovation grant that was really trying to provide public sector investment that would be matched oftentimes by private sector commitments that was focused on trying to eliminate plastic waste in the environment. That was further developed under the challenge program that was talked about at the Halifax meeting of the G7.

We think those are opportunities to really leverage the

private sector funding and to ensure, again, that we have a collaborative effort to identify what are going to be the most cost-effective investments of both taxpayers' dollars, as well as private sector funds. We are very supportive.

Senator Inhofe. That is good. I think we need to become more familiar with that. A lot of heavyweights were involved in those decisions and that discussion in Nova Scotia.

Mr. Karas, I think we may share one philosophy that I kind of picked out of your opening statement, and that is it has been my experience over the years -- and I have been on this Committee since, I don't know, a lot of years -- that some of the solutions to problems are best handled by the private sector.

I can remember when we had a lot of the Superfund problems. I was actually chairing this Committee at that time. What happened, and I won't mention the oil company, it was an oil company, though, that was working at that time in Louisiana, and they did have a spill, and it was a pretty serious one. So they went in and evaluated what it would take to clean that up and what it would cost to clean that up.

I am going from memory now, but I think it was something like it would take 13 months if this oil company were allowed to do it at the cost of \$7 million. EPA rejected it at that time. We were kicking and screaming about that, but they did. They

took this on and it ended up taking not 13 months, but 4 years; and not \$7 million, but \$15 million.

I guess what I would ask you, your thoughts on the things that can be done through private sectors that cannot be done through the public and what your experience has been.

Mr. Karas. Thank you, Senator. I think the way I would answer that question would be in really looking at this space. We are good at making beverages and marketing beverages and selling; that is our core business, we make beverages. And what we find when we get into a space like waste is we have to rely, in my comments I talked about the critical importance of partnerships, we have to rely on others.

What we have learned in the course of we had a water stewardship goal to replenish the volume of water that we put in our products by 2020. We met that early. We met that because one of the reasons was public-private partnerships. We have a public-private partnership with USDA, U.S. Forest Service. For us, it gives us resources that we thought we would never have, knowledge and information that we wouldn't have access to, and, really, we learned a lot and advanced quickly.

So I think our learning in these spaces has been it is absolutely mandatory for us to really reach out and engage with trade groups like ACC, with technical people that are knowledgeable, to really come to a great solution collectively.

I think that is what ultimately wins the day.

Even when we do partnerships through our foundation, we have something called a Golden Triangle partnership, and what we learned when we link business, civil society, and the government together to look at a problem, we usually get to a really good place, a place that we wouldn't have gotten to by ourselves.

Senator Inhofe. Thank you very much.

Thank you, Mr. Chairman.

Senator Barrasso. Senator Carper.

Senator Carper. I am told by my colleagues and our staff that you all are doing a good job. As you know, we serve on a bunch of different committees and, unfortunately, all my committees are meeting right now, so I am trying to be three or four places at once. I am not doing really well at it, but now I am with you and look forward to asking a couple questions.

First, I want to ask unanimous consent, Mr. Chairman, to enter a letter from MERR and supplemental materials be entered into the record from the Marine Education, Research & Rehabilitation Institute in Delaware, as well as some other supplemental materials.

Senator Barrasso. Without objection.

[The referenced information follows:]

Senator Carper. Thanks very much.

Dr. Law, if I could just aim my first question at you. I am told by my staff that you spent a lot of time at sea. They said more than probably anybody in the room. I was in the Navy for 23 years, mostly in airplanes; some time on seas, but I would be happy to give that honor to you today.

They tell me you spend a lot of time at sea observing firsthand the impact of marine debris on the environment, but also especially on wildlife. Do you want to share with us some specific examples of some things you have seen with respect to marine debris' harm to wildlife, including marine mammals, sea turtles and birds?

In addition to minimizing the amount of debris that ends up in our oceans, what else should we be doing to mitigate these impacts?

First some examples.

Ms. Law. Sorry?

Senator Carper. First some examples.

Ms. Law. Some examples, yes.

Senator Carper. And then some ideas on what we ought to be doing to mitigate these impacts.

Ms. Law. Sure. So, most of my sailing experience has been in the open ocean, much of it in what are called the subtropical gyres, which are areas of the "garbage patches." These are

areas of the ocean that are actually quite nutrient poor and not  
--

Senator Carper. Most people probably try to avoid those.

Ms. Law. Sorry?

Senator Carper. Most people try to avoid those.

Ms. Law. Most people try to avoid those, that is right; there are not a lot of wind. They are not places many people spend a lot of time, but we do spend time doing our science there.

I think the most important observation I have had is that many of the descriptions we hear about this problem are not what you observe out at sea on the boat. I don't see very large objects going by, but when you do it is very surprising to see a shoe or a bucket or a teapot or a toothbrush drifting by thousands of miles from land.

When you look over the side, you see these little bits of plastic. And in terms of interaction with wildlife, what I have observe personally is sea birds who are feeding at the sea surface where these little bits of plastic are floating. So while you can't actually see it hanging out of their mouths, you know that the birds are eating these plastics.

Similarly, we have captured in our nets, at one point we captured a five-gallon bucket that did have a fish swimming under it. That fish, we brought aboard and it had 42 pieces of

microplastic in its gut. We also tow a fishing line. We brought a mahi-mahi onboard and it had a piece of plastic --

Senator Carper. Was the fish dead or alive?

Ms. Law. Just a line with a hook.

Senator Carper. Okay.

Ms. Law. We brought a mahi-mahi on board for dinner and it had a piece of plastic this big in its stomach. So we were faced right then, do we want to eat this fish or not? We did. It was delicious.

Senator Carper. Did you? Okay.

Ms. Law. But I have not seen marine mammals entangled myself, so I don't have that personal experience.

I really think I come back to we have to keep this out of the ocean to solve it. The rescue efforts, when people spend lots of time and resources to help these animals when they are entangled are critical, and when we have access that is very important, but we just have to stop it from entering.

Senator Carper. All right.

I like to focus on root causes. I just came from a Homeland Security business meeting; we are marking up about 20 different bills. One of the things we focus on in Homeland Security is border security, including border security with the border with Mexico. We spend a lot of time, effort, and energy trying to keep people from getting into our country from places

like Honduras, Guatemala, El Salvador. The root cause of all that, though, is the lives that they live in those three countries are miserable; and we are complicit in their misery given our dependency and addition to all kinds of drugs, narcotics.

But part of the root cause in solving that problem, all these people trying to get into our Country from our southern borders, is to help make sure that their lives are less miserable in those three countries; they have some hope of opportunity. That is the root cause.

Is there a root cause in this case? Is there a similar root cause we ought to be focused on, rather than just focusing on the symptoms of the problem? I have a great photograph of Coast Day in Delaware this last weekend, but we are addressing the symptoms of problems. There is always trash that washes up on the east coast, including in Delaware, so we focus on the symptom of the problem.

If we looked for the root cause, where should we be looking? Because we are really good at spending a lot of time and energy and resources on symptoms of problems, not always on the root cause.

Mr. Dooley. Senator, the way that I would respond to that, if you look at where the major source of the problem, it is in the developing economies; and in those developing economies they

have a host of public needs. Some of it is nutrition, some of it is education, some of it is healthcare, and some of it also is waste management systems. When they prioritize them, oftentimes the waste management investments come down very low on the list, and that is why, oftentimes, they lag behind in developing the waste management systems. As their economy develops, it becomes the source of a lot of the waste plastic and other waste that is getting into the environment.

That is where I think we have an opportunity in the industrialized world in the private sector to allocate resources to help prioritize waste management, and part of that help in prioritizing investments in waste management is providing public and private sector support. We think if you do that in the developing world, we can make a tangible difference in reducing the amount of plastic waste in the environment.

Senator Carper. Good. Thank you.

Mr. Karas, please.

Mr. Karas. Just an add-in. I think we maybe touched on it around the fringes in the conversation here, but infrastructure is absolutely important. But the layer over that, and we have learned this as we have done projects, it is the level of I guess you would call public education and awareness. How do people value that material? Obviously, if it is all in the ocean, it is a throwaway, and we are not thinking about it.

Even in the developed world it takes time to change sort of the hearts and minds, and that has to accompany all the work that we are doing. So, it maybe starts with PSAs, but maybe ingraining into younger generations what should you do with materials when they are in your hand.

I would suspect that if you asked most of the public about recycling, recycling is the act of putting something in a specific container, and not thinking about the circular economy and where it needs to go in the long-run. So, I think some of that cultural piece is important to mix in with that.

Senator Carper. All right, thanks.

Senator Barrasso. Senator Whitehouse, now that Senator Inhofe has completed, did you want to get a continuation of the line of questioning?

Senator Whitehouse. Sure, if Mr. Karas and Dr. Law. I don't know if you recall the question; it had to do with the various recommendations about trying to stem the flow into the seas, particularly in the big rivers; about trying to invest in biodegradability; about trying to make it a better revenue proposition for fishermen to keep and recover lost fishing gear; and the last one was research on the human health effects of ingesting microplastics. Are those areas we should be working on and are there other areas you would recommend? That was the question.

Mr. Karas. Senator, I think those are all good areas that you highlighted there. I think what we have learned in the Asia Pacific region as our business units work is we are having to form some of these cooperative partnerships. We are doing it in Indonesia and the Philippines, starting some of that in Vietnam to really start to look at where do you start. I think that is sometimes the challenge. Here we can look at our infrastructure that exists. Maybe it is not well connected, but it is like where do you start, what is ground zero, and we have to do that collaboratively.

So, what we are seeing is brands are engaging with different NGOs and governments to say, okay, how do we move the needle in that. I think those will help in the long-run, but it takes time to build those out.

Senator Whitehouse. And in this case it takes incentives.

Mr. Karas. Correct. Correct. But I would add that in terms of incentives, and maybe it is something that Cal has already touched upon, I think we have to really think closely about the end markets and the value of the materials.

What often is lacking, you could sort out polypropylene, but there may not be a market there; and if that doesn't happen, if the economics aren't there, it just isn't going to work. But if we can work to build the proper end markets, it really starts to close the loop. To me, when a business has an incentive to

get that material and put it into something else, that is going to be a powerful driver in that space.

Senator Whitehouse. You will agree that there is a discrepancy between the recovered value of waste plastic and the value to humanity of not having an ocean in which there is more plastic than fish.

Mr. Karas. I would agree. I would agree.

I guess in terms of waterways, one of the interesting experiences we have had here, I talked about partnerships earlier, a group called Living Lands and Waters works our own Mississippi River system. Actually, six barges collecting materials, anything from cars, tires, drums, and plastic.

We have had the opportunity to be able to really create a circular economy with those kinds of activities, actually bring material out of the Mississippi. We had an example, last year sorted 9,000 pounds of PET hand-sorted by our own bottler there, and it was turned into bottles for a product 30 days later. That is a circular economy, but we had to force it.

So, ultimately, I think it is how do we really have a vertically integrated waste management system that really allows it to pull through where there is economic viability to that activity. If you have to prop it up because it doesn't have economic viability, it is going to collapse sooner or later, or you are always going to be feeding it funding. So, to get the

2.0 system it really requires some thinking and thoughtful examination of where we want to go.

Senator Whitehouse. Dr. Law?

Ms. Law. Thank you. I do agree with all of your priorities, especially the impacts on human health, and I think we need to expand that conversation more broadly into impacts of plastics and freshwater and soils and agriculture, and things like that.

Other opportunities, though, that I would like to raise are the idea that we can try to make less waste; and this is falling on the previous question as well, starting to think about a cultural shift away from disposable, away from I use it, I put it in the garbage can, and it goes somewhere that is no longer my problem. So, encouraging reuse programs.

One really simple intervention we can all do is put in refillable water stations into our public spaces to encourage people to carry a reusable bottle, as opposed to using something a single time. So I would just like to point out not just information campaigns, sort of your traditional education campaigns, but thinking about targeted interventions in spaces that are locally defined about quite simple interventions that will cause us to just simply make less trash that we then have to deal with.

Senator Whitehouse. Mr. Chairman, shall I tell a brief

sailor story that Dr. Law's testimony called to my recollection?

Senator Barrasso. Please.

Senator Whitehouse. Newport, Rhode Island is probably the sailing capital of the world; we claim that, anyway. Delaware may have a disagreement, but I am sure we have Wyoming beat.

[Laughter.]

Senator Whitehouse. A lot of sailboat racing goes through Newport, including what is now called the Volvo Ocean Race, which is perhaps the most dangerous and demanding sporting event on the planet; and it is around the world, very fast race, very high-tech boats going very fast. Racing boats have, for generations, had to learn a man overboard drill.

You don't go offshore racing without having drilled and drilled on the man overboard situation; who is the spotter, how quickly do you turn the boat. You know, the whole routine is just drilled until you can, as soon as somebody yells overboard, everybody knows exactly what they are supposed to do.

For the first time these racing boats have to have a new and different drill, and that is a keel clearing drill. They sail through the South Atlantic on their course and they sail near the place that is farthest from land anywhere on the surface of the earth; and even out there they are still doing these keel clearing drills. When the boats came into Newport from Brazil on their leg that ended with us, you could see the

boats in Newport Harbor as they came in within sight of each other.

They had sailed all the way from Brazil and these races are still so close that they end up within minutes of each other, within sight of each other as they finish, so you really, really need to make sure that your vessel is operating at peak performance. And they have enough computers to know when it is off performance, so they then have to deploy -- they know what is wrong, they keep clearing drill; and somebody has to go over the side real quick, with goggles and a knife and whatever else they need, to get the junk, the plastic junk, usually, that the keel has swept like a single comb tooth out of the ocean and get their boat operating back at speed again.

So, it is an interesting physical comparison to the longstanding, ancient, well established man overboard drill. It is only now, only in the last few years that ocean racers now have to come up with a whole new drill that they have to practice, keel clearing, even in the farthest corners of the South Atlantic.

Senator Barrasso. Thank you, Senator Whitehouse.

Senator Carper.

Senator Carper. Mr. Karas, I don't know a whole lot about Coca-Cola's World Without Waste campaign, but I am told that the goals are ambitious. I am told that it will really make a

difference to improving international recycling practices and reduce waste in our oceans, and that is encouraging. What are the biggest challenges that your company faces in implementing these goals domestically and what can Congress do to support your efforts in this Country?

Mr. Karas. I think domestically the biggest challenge that we are trying to work through now, and I mentioned this in some of my earlier comments, at times I am dealing with sort of the waste infrastructure 1.0. I may have five different entities, public and/or private. One might be hauling, one might be operating the material recovery facility or the MRF. My end market might be somewhere off in the distance, and it is very disconnected.

So, for us to be able to deliver 50 percent recycled content, I have to do it in a way that I have an adequate supply, adequate a good quality material, so I think the challenge is I am looking to see what the next 2.0 waste management system will be in the long-term.

We have a combination of different efforts that we are doing to really work on vertically integrating that system, so, from a business perspective, if you are one and the same entity, I just toured a MRF, material recovery facility, earlier this week. They are integrated with making cardboard boxes, so they pull the cardboard out of the materials coming into this site,

drive across the parking lot and they are making brand new cardboard boxes. When they do it that way, it works; it has value. I think that is sort of the area that we are seeing as the biggest challenge, is how do we really get that system to work.

I think the second piece is we have probably, it is something I mentioned earlier, about the culture right here in this Country. I really believe that people don't understand the concept of the circular economy and we have very much a culture that is throwaway, so we are working on that space as well.

Senator Carper. Any question you have not been asked that you would like to be asked?

Mr. Baillie. I just wanted an opportunity to respond to the systemic question that you asked.

Senator Carper. Oh, good.

Mr. Baillie. I think there is nothing inherently bad about plastics, but in 1950 we were producing 2.3 million tons.

Senator Carper. How much?

Mr. Baillie. Two point three.

Senator Carper. In what year?

Mr. Baillie. In 1950. And now it is 500 million tons. So that is a massive increase. And we haven't moved to that closed loop economy, so we are producing these plastics without a full cycle of what will happen to them going forward, and there is

just too much of it.

But when you talk about the source, it is really working with the industries and saying how can we produce plastics that can definitely be recycled. When you have multiple plastics, say, in a toothbrush -- there are three types of plastics, often -- it makes it much more difficult to recycle. So how can we create conditions where it is easy to recycle things? And things like coffee cups, we have plastics being mixed and layered with wood and with aluminum. Again, it makes it extremely difficult to recycle that. How do we simplify that process?

If we can do that and then we develop more standardized approach across the United States in terms of recycling, we can bring recycling to scale. The things you do in D.C. are different than you might do in States across America. We have to standardize this process so we can work at scale and we can innovate at scale.

Then we talked about innovation. I mentioned the Impact Investment Fund we are promoting, but there are much larger funds out there, and I think there is a real opportunity for Government to work with the private sector to develop these large funds to actually drive innovation.

Then, finally, incentives. We talked about the five cents on a plastic bag, which makes a world of difference, or the five

cents to collect a bottle, which makes a world of difference. We have to explore and deliver on these standards.

Then, I think that the United States can then play a much stronger global role. We are now only recycling 9 percent of our plastics. Some of these other countries that we are talking about that are putting more waste into the world are actually recycling more than we are. So, we should set a target of going from at least our 9 percent to what Europe is doing, which is around 30 percent, to ensure that we can then move into a leadership position in this space and lead with our innovation as well.

Senator Carper. Congressman Dooley.

Mr. Dooley. If I may respond. I would say that the fact that we have seen an increased use of plastics, that has been a significant contributor to enhancing global sustainability. A few years ago, UNEP, the United States Environmental Program, at the request of one of their members, did a study in terms of trying to identify the environmental costs of plastics. They hired a firm called True Cost that went out and did this study, and they came back and they said, okay, it is about \$90 billion a year.

From a policymaker's perspective, I said, what would you respond to a study that said that? You could be led down to say, well, then we ought to eliminate the use of plastics. What

we did at ACC, we said, you know, you need to do a more comprehensive assessment.

We went back to True Cost, we said, not only should you do an assessment of the environmental cost of plastics, but what would be the environmental costs of the alternatives. They did that and they came back to us and they said, it is a good news, bad news story. It is not 90 billion, it is 139 billion for the environmental cost of plastics. But the good news is, from a plastic manufacturer, is that the environmental cost of using alternatives to plastics was four times as large.

So I think we have to be careful here when we are trying to develop policies that are going to ultimately enhance global sustainability, that we should do so in a manner that is really based on doing comprehensive assessments of the life cycle impact of the various materials. When you take that approach based on the more comprehensive study, it sends a signal to us as manufacturers that we have to do a better job of ensuring that the plastics that are increasingly being used are more easily recycled, that their energy and their chemicals can be more easily recoverable so that we can minimize their impact in terms of the environment, but still capitalizing on the positive environmental benefits from their use.

Senator Carper. Fair enough. Thank you. Thank you, Cal.

Could I have one more question, Mr. Chairman?

I am trying to remember the name of the new program they have over in China. I think it is called the Green Fence policy. It is a ban on importing plastic waste. As you know, China was our market for these materials and for a long time they previously accepted about 30 percent maybe a third of our plastic waste. In our Country, local municipalities are having more trouble now breaking even when collecting and recycling this waste.

Anybody have an idea what are some of the best ways for the U.S. to address this new challenge? Any thoughts?

Mr. Dooley. Again, I think that there are some real opportunities to use this as an inflection point where we could see opportunities to increase the value of this accumulating plastic waste. In my opening remarks, we identified some policies that we currently have in place in the United States that are impeding the flow of investment capital in developing the innovations that can transform that mixed waste or plastic waste stream accumulated into energy as well as into going through a pyrolysis where you can turn it into feedstocks.

Now, if you want to try to get a permit for a pyrolysis unit to do waste plastic, sometimes it is subject to being permitted as a hazardous waste facility versus what could be a recycling center. If you make that small change, you could, again, create a greater incentive for the flow of that

investment capital to develop those new innovations.

The same thing, if you could develop diesel or a syn fuel from a plastic waste stream, it doesn't qualify for the alternative fuels treatment or renewable fuels. Making simple changes like that are going to encourage a lot of investment from a lot of startup companies, as well as a lot of large companies, to make investments that can add value and capture the energy and the value in that plastic waste stream.

Senator Carper. Were you this smart when you were a Congressman?

[Laughter.]

Mr. Dooley. I was smart enough to leave.

[Laughter.]

Senator Carper. I will say in closing, for myself, this is a really important issue and I again want to thank Senator Whitehouse and Senator Sullivan for their great leadership on this, and our Chairman for holding this hearing and for Senator Inhofe's strong interest in this issue as well. This is one I care about enormously. I am sorry there is so much other stuff going on that hasn't allowed me to be here.

One of my favorite witnesses, the guy who is the controller general of the Country, the head of GAO, General Accountability Office. His name is Gene Dodaro. I don't know if you have ever met him, but he comes and testified fairly regularly on

different committees. Sometimes he will be sitting right where you are, Mr. Karas, and he speaks opening statement, no notes. Answers every question, no notes. Finally, I noticed one day that when he would speak there was a woman sitting right behind him and her lips were moving when he spoke.

I have been watching you and your responses, and there is a lady in a red dress right behind you, and I noticed that her lips were moving when you speak. She looks very familiar and I just want to say to Missy, welcome to our hearing; it is great to see you. You have another career ahead of you if you can take this show on the road.

Thank you very much.

Senator Barrasso. Thank you, Senator Carper.

Thank you all. This was very productive.

Senator Whitehouse, thank you for your leadership. Thank Senator Sullivan as well.

If there are no more questions today from the panel, members might submit written questions for up to two weeks, so the record will stay open for that period of time.

But I really do want to thank all of you for being here, as well as what you are doing on this vital, vital issue. Thank you to National Geographic for your leadership and for putting visually something that I think really caught the attention of the Country and the world.

With that, this hearing is adjourned.

[Whereupon, at 11:52 a.m. the committee was adjourned.]