NEAL R. GROSS & CO., INC.

RPTS WALTER

HIF064180

REDUCE, REUSE, RECYCLE, REFORM:

ADDRESSING AMERICA'S PLASTIC WASTE CRISIS

WEDNESDAY, MARCH 4, 2020

House of Representatives,

Subcommittee on Environment and

Climate Change,

Committee on Energy and Commerce,

Washington, D.C.

The subcommittee met, pursuant to call, at 10:30 a.m., in room 2322, Rayburn House Office Building, Hon. Paul Tonko [chairman of the subcommittee] presiding.

Members present: Representatives Tonko, Peters, McEachin, Blunt Rochester, Soto, Matsui, McNerney, Ruiz, Dingell, Pallone (ex officio), Shimkus, McKinley, Johnson,

Long, Flores, Carter, Duncan, and Walden (ex officio).

Also Present: Representatives Cardenas and Bucshon.

Staff present: Jacqueline Cohen, Chief Environment Counsel; Adam Fischer, Policy Analyst; Anthony Gutierrez, Professional Staff Member; Caitlin Haberman, Professional Staff Member; Rick Kessler, Senior Advisor and Staff Directory, Energy and Environment; Brendan Larkin, Policy Coordinator; Nikki Roy, Policy Coordinator; William Clutterbuck, Minority Staff Assistant; Jerry Couri, Minority Deputy Chief Counsel, Environment and Climate Change; Tyler Greenberg, Minority Staff Assistant; Peter Kielty, Minority General Counsel; Mary Martin, Minority Chief Counsel, Energy and Environment and Climate Change; Brandon Mooney, Minority Deputy Chief Counsel, Energy; and Peter Spencer, Minority Senior Professional Staff Member, Environment and Climate Change.

Mr. Tonko. [Presiding.] The Subcommittee on Environment and Climate Change will now come to order.

I recognize myself for 5 minutes for the purposes of an opening statement, as we welcome our panel of witnesses.

Today's hearing is an opportunity for us to begin to examine our nation's waste challenges as well as some potential solutions. Reducing waste and encouraging recycling can play an important role as we seek to make our nation more sustainable and transition to economywide net zero greenhouse gas emissions. I think I am safe in saying that every Member and every witness likes recycling, and the broader public likes recycling, too, but many people have concerns that materials in their curbside bins often do not end up being recycled. We know that many recyclable products end up in landfills, and plastic waste, in particular, is ending up in our environment and our oceans.

So, this is a very serious issue, and I am happy to see many Members wanting to get engaged. In the past few months, there have been numerous pieces of legislation introduced which I expect we will hear about today. These bills cover marine debris, recycling infrastructure, consumer education, and plastic waste.

Undoubtedly, this interest has been driven by China's decision in 2018 to impose restrictions on imported waste. For decades, we relied on China as a dumping ground, especially for our low quality and contaminated waste. The closure of this market has had major impacts on the United States recycling system, causing municipalities to scale back once profitable programs, many of which are now actually costing local government money.

While China's National Sword Policy has surely caused an upheaval, I think we would be mistaken if we simply blamed China for no longer wanting our waste. This episode has exposed longstanding issues in our system. We have been sweeping deficiencies in domestic markets, education, and infrastructure under the rug so long as China was willing to accept our waste. I hope we can see this as an opportunity to reevaluate our domestic efforts and try to understand how the federal government can play a constructive role in improving recycling outcomes.

But we risk falling into a trap if we begin to believe that recycling can be the solution to our nation's waste issues. It is not a silver bullet. It is worth reminding everyone that we teach children the importance of reduce,

reuse, and recycle.

There is a reason recycling is third in that slogan. We need to put a much greater emphasis on reducing, first and foremost. There are meaning reduction opportunities for all materials, but especially plastics, where there are growing numbers of alternatives for many single-use products. Many state and local governments are now tackling this issue head-on. So, it is an appropriate time to consider the role of reduction as part of the strategy to address plastic pollution.

We also need to consider how to reduce contamination of waste stream. American contamination levels are at 25 percent, meaning that one out of every four items placed in a recycling bin should be thrown into trash. This is particularly challenging for paper products, which often do have viable domestic markets if collection and sorting processes work properly, but can be easily contaminated.

Today, we will hear about a wide range of potential solutions: improving consumer education, encouraging standardized packaging, designing products to be more easily recycled, and incentivizing recycled content in manufactured products, which can have significant energy reduction and

climate benefits.

I look forward to our witnesses advising us on a path forward because, knowing the environmental and climate impacts of plastic waste, as well as the newfound economic pressures on local governments' recycling programs, now is the time for us to come together and embrace some of these common-sense solutions for our nation's waste issues.

I thank our witnesses for being here and look forward to the discussion at today's hearing.

With that, I will yield to the ranking member on the Subcommittee on Environment and Climate Change, Representative Shimkus, for 5 minutes.

Mr. Shimkus. Thank you, Chairman Tonko, for this opportunity to speak about today's hearing on recycling and waste management, including plastics.

I want to personally welcome Billy Johnson here -- he is a good friend and ally for many, many years -- and, of course, the American Chemistry Council, who helped so much on TSCA. So, we have developed great relationships with those.

For the last 12 years, Chairman Pallone and I have also served as co-chairs of the House Recycling Caucus. It has been a great opportunity to learn more about the benefits of

recycling as well as the challenges faced by the larger recycling industry. And then, you learn about the great diversity in the recycling world.

Recycling is an issue that I believe makes great sense for both the environmental and economical perspective. We have heard a lot about the demise of recycling in America after China ended imports of recyclables from the U.S. The recycling industry, however, remains extremely important to the U.S. economy.

Additionally, recycling conserves our natural resources and permits obsolete, previously-used surplus and byproduct materials to be processed into specific commodities that are used to manufacture new products. In 2018 alone, more than 120 million metric tons of scrap material was processed in the United States for reuse, generating $109.78 billion in economic activity and directly employing 164,000 Americans.

Is recycling perfect? Absolutely not. Are some recycling sectors better positioned than others? Of course they are. Are global markets and individual commodity prices determinative on whether certain items are recycled and the quality of those products? Of course. Is there room for improved education, infrastructure, and research? Certainly,

there is. These are all worthy subjects that I hope we can get to today.

Unfortunately, I am worried about a few undercurrents that appeared in the testimony. There are ideas there that I cannot support and would encourage others not to support as well.

The first is getting the federal government involved in dictating the terms of how local governments should collect and manage discarded solid waste. The Solid Waste Disposal Act has a well-established delineation of authorities between the federal government and the states. The federal government takes the lead on hazardous waste management, and states and local governments are primary in the solid waste arena. I do not support dismantling that wall between the two and injecting the federal government to setting curbside collection requirements and recycling standards for discarded items that are not hazardous.

The second bothersome item for me in some of the written testimony was the desire to place new federal costs on manufacturing of non-hazardous items and federal mandates on material content and design of those items. This kind of policy strangles innovation and initiative on the business

end and, ultimately, shifts costs to consumers in the form of higher taxes or increases in consumer goods and prices.

The last bothersome thing I found in the testimony was the view that we need to reduce manufacturing in the United States, whether from virgin materials or entirely out of recycled ones. This sentiment included agriculture, timber, and mining -- important industries in flyover country, where I currently reside, and rural areas across the country. These types of industries are essential in keeping us a strong nation with a high standard of living.

We all want a clean environment, but we cannot fund it in a competitive global marketplace if Americans' ingenuity consciously recedes into a place where our manufacturing sector has a GDP of a third-world country. At a minimum, items break down and you need to replace them.

On the subject of plastics, there is a good deal that we need to learn about the plastics issue and what is happening today and in the future. I hope we will explore solutions to both marine debris and mitigating greenhouse gases release from landfills or a manufacturing plant. I know some people think it would be easier to ban plastic, but I do not believe that is a good policy to ban materials just because you don't

like them. We should explore whether banning plastic would actually exacerbate the problems Congress thinks it is solving with a ban, as well as what other risk tradeoffs occur from taking such an action.

That said, I join Chairman Tonko in welcoming our witnesses here today, and I thank them for their time and their expertise.

With that, Mr. Chairman, I yield back my time.

Mr. Tonko. The gentleman yields back. The chair now recognizes Chairman Pallone, chair of the full committee, for 5 minutes for his opening statement, please.

The Chairman. Thank you, Chairman Tonko.

Recycling has long been an essential tool in our environmental protection toolbox. Unfortunately, it is clear from the plastic pollution in our oceans that our recycling system is simply not working. Plastic pollution is contaminating our air, our land, and our water, and contributing to the climate crisis.

I was going to mention that Mr. Shimkus and I are co-chairs of the House Recycling Caucus, but he already mentioned it. And he doesn't seem to be too happy this morning. I don't know why, but usually he smiles more.

[Laughter.]

But I did want to sound a more somber note if I can say to Bill Johnson that I do miss Mark Reiter. He at ISRI was always the main person who would remind me about all the things we needed to do with recycling and the future of recycling. So, I do miss him today, Bill, but it is good to see you here, Bill.

Recycling can play an important role in addressing climate change and reducing pollution in our communities while also boosting local economies, but we will only realize those benefits if we modernize what is becoming an outdated system. At the same time, we can't forget that recycle is the third "R" in "Reduce, reuse, recycle." As we examine ways to address the plastic waste crisis, we must consider what happens to materials both before and after they reach the consumer, and that means reducing the amount of waste we generate in the first place, while also creating the right incentives to reuse recyclable material.

And we now understand the important role composting can play in reducing waste going to landfills and contaminants in our recycling system. This is particularly important if we substitute compostable products for single-use plastics and

other difficult-to-recycle items.

Now for decades, we know the U.S. shipped most of its recyclables, including 70 percent of its plastic, to China for processing, and this was profitable for American recyclers and hid any environmental cost from the American public. But the truth was that up to 30 percent of that material exported was contaminated, making it unrecyclable. In 2018, China banned the import of most plastic waste and mixed paper material as part of an effort to curtail pollution, and this policy shift has changed the U.S. recycling market and is forcing us to recognize that much of what we thought we were recycling was actually being discarded.

Some municipalities have been forced to scale back their recycling programs while others are canceling curbside collection altogether. With no viable alternatives, many communities have been left with no choice but to direct their waste to landfills, and many are looking beyond recycling to efforts to reduce waste to solve the problem. Others are considering outright adopting bans on plastic bags, straws, and other single-use plastics. And some cities are employing incineration to turn waste to energy, and this offers climate

benefits compared to landfilling, but does not offer the same level of environmental benefits as recycling or source reduction.

For certain materials, the recycling system is working relatively well. Aluminum, for example, 90 percent of that is, I guess, recyclable. And of all the aluminum ever produced in North America, 75 percent remains in use today.

But that is not the same for plastics. Over the last 60 years, about 8 billion tons of plastic have been produced globally and about 75 percent has become waste. And it is often cheaper to make new plastics from fossil fuels than to recycle it. And because plastic takes more than 400 years to degrade, most of this waste is either languishing in landfills or found in the environment as litter. One study estimates that there will be more plastic than fish in the ocean by 2050.

And this pollution contributes significantly to climate change. Last year, global greenhouse gas emissions from plastic production, transport, and disposal was equal to the emissions from 189 coal-fired power plants. And that footprint is projected to more than triple by 2050, consuming up to 13 percent of the planet's remaining carbon budget.

So, solving the climate crisis will require strong action to address emissions from production and disposal of plastic. This committee has been hard at work developing legislative solutions to address the climate crisis. In January, we released the Clean Future Act, which will put the U.S. on a path to net zero greenhouse gas emissions by 2050. When we released that draft, we noted several areas needing further work, including recycling issues.

So, I am pleased that we are holding this hearing today to continue that work, and I look forward to hearing the witnesses' perspectives on how we can modernize our recycling system and our economy, particularly to solve the plastic waste crisis.

So, thank you, Mr. Chairman. This is a very important hearing.

Mr. Tonko. Thank you. The gentleman yields back. The chair now recognizes Representative Walden, the ranking member of the full committee, for 5 minutes for his opening statement, please.

Mr. Walden. Good morning, Mr. Chairman.

Mr. Tonko. Good morning.

Mr. Walden. And thanks to our witnesses today, and we

appreciate the hearing on recycling, waste management, plastics, and how these play a role in our society and the environment, something I think we all care deeply about, especially with all the stories about plastic floating around out in the ocean and the sources of that waste.

I think it is a really interesting topic and it does give us a chance to jump in more deeply into an issue that has gained a lot of traction, especially since China fully implemented its National Sword Policy which bans the importing of plastics and other recyclables, and in so doing, it will force us to consider many other issues that could raise significant and long-term policy impacts on the quality of life in the U.S.

Mr. Chairman, I want us to do work that points us to targeted solutions. I want us to do work that will bring meaningful results. I am concerned, though, that this hearing, between its title, explanatory press statement, and the limited number of witnesses, is trying to pack an awful lot of issues into one thing. And the subcommittee may not be able to adequately cover or make progress on any individual subject.

It is particularly true if this non-specific hearing is

meant to satisfy some regular order requirement for any pieces of legislation because these are really important issues, and we need to be able to dive deeply on each one of them to get it right.

First, the existing legal structure in the Solid Waste Disposal Act has, for the last four and a half decades, had the federal government setting policy for hazardous waste, but left curbside collection of ordinary trash and recyclables up to states and local governments. Some of our witnesses are suggesting a federal takeover -- at least that is my term -- of some of these responsibilities or precluding use entirely of sources of waste management such as incineration. Now those kinds of moves could strand billions of dollars in existing municipal investment and create waste collection management disruptions and confusion. If this is the direction the committee wants to go, we need to hear from the EPA; we need to hear from states -- I know our counties are in town right now -- and local governments because they will all be impacted. So, hopefully, we would hear from all of those elements.

Second, recycling rates, regardless of the item being recycled, are driven by quality feedstocks, high commodity

prices, efficient collection, infrastructure resources, and effective public education. Now some sectors, like paper recyclers, have done a good job making investments to build out the infrastructure and pursue high-quality paper economically. Others are suffering because either the price of their commodities is low or they don't have a good collection infrastructure, or both.

As for plastics, there are really two big issues, global marine debris and domestic management of plastics. We know EPA is actively working on its Trash-Free Waters Program to help capture or prevent marine litter from reaching the ocean, something that the EPA Administrator Andrew Wheeler spoke about during last week's subcommittee hearing.

In addition, the private sector I know is making major investments in attacking this problem. I think we could find a lot of collaboration on that matter. The domestic management has interesting permutations to it, from single-use plastics to low recycling rates. Plastic also shares the lack of domestic collection infrastructure that led to Asian importation policy against U.S. exports of these items.

I wish we could have heard from the various sectors today to completely explain all these situations for us, so

we could better understand plastics and the forces in Asia driving their waste laws.

Third, plastic usage also brings up questions about climate change risks and the use of fossil fuels to make plastic. Before people look to remove plastic from the economy on the criteria alone, I think it would be good to have a discussion of what alternatives look like, and not only what their carbon footprint is, but also whether these items make our society safer or more secure. Moreover, we need to look at whether the tradeoff in lifestyle emissions is worse, rather than better, as it relates to climate and the environment.

So, Mr. Chairman, we do have a serious challenge we are trying to tackle today. The answer is innovation, preparation, conservation, adaptation. And I welcome our witnesses and look forward to hearing from them.

As a final footnote, we do have another subcommittee going on downstairs. So, some of us have to bounce back and forth, but we do have your statements. We appreciate your input.

It is really an important issue. Oregon, my home state, led in these areas. My father in 1971 supported the bottle

bill in Oregon. I think Oregon and maybe one other state were the first. So, it means a lot to Oregonians and me personally. We look forward to working together.

Thank you, Mr. Chairman. I yield back.

Mr. Tonko. The gentleman yields back.

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

I now will introduce the witnesses for today's hearing. Again, welcome to each and every one of you.

We begin with Dr. Jenna Jambeck, professor at the College of Engineering at the University of Georgia.

Seated next to her is Mr. Enrique Zaldivar, general manager of the Los Angeles Sanitation and Environment Bureau, the city of Los Angeles.

Next is Ms. Lynn Hoffman, co-president of Eureka Recycling.

Next to her, Ms. Denise Patel, U.S. program director of the Global Alliance for Incinerator Alternatives.

Next, we have Mr. Keith Christman, managing director of plastic markets, American Chemistry Council.

And finally, Mr. William Johnson, chief lobbyist of the

Institute of Scrap Recycling Industries, Incorporated.

Welcome again to each.

Before we begin, I would like to explain the lighting system. In front of you are a series of lights. The light will initially be green. The light will turn yellow when you have one minute remaining. Please begin to wrap up your testimony at that point. The light will turn red when your time has expired.

So, I now recognize Dr. Jambeck for 5 minutes to provide an opening statement, please.

STATEMENTS OF JENNA JAMBECK, PROFESSOR, COLLEGE OF ENGINEERING, UNIVERSITY OF GEORGIA; ENRIQUE C. ZALDIVAR, GENERAL MANAGER, LOS ANGELES SANITATION AND ENVIRONMENT BUREAU, CITY OF LOS ANGELES; LYNN HOFFMAN, CO-PRESIDENT, EUREKA RECYCLING; DENISE PATEL, U.S. PROGRAM DIRECTOR, GLOBAL ALLIANCE FOR INCINERATOR ALTERNATIVES; KEITH CHRISTMAN, MANAGING DIRECTOR, PLASTIC MARKETS, AMERICAN CHEMISTRY COUNCIL, AND WILLIAM JOHNSON, CHIEF LOBBYIST, INSTITUTE OF SCRAP RECYCLING INDUSTRIES, INCORPORATED

STATEMENT OF JENNA JAMBECK

Ms. Jambeck. Thank you. I would like to thank Chairman Pallone, Chairman Tonko, Ranking Members Shimkus and Walden, and the rest of the Environment and Climate Change Subcommittee, for the opportunity to testify today.

My name is Jenna Jambeck. I am a professor of environmental engineering at the University of Georgia and a National Geographic Fellow. I have been conducting research on solid waste for over 24 years with projects on marine debris and plastic for 19.

I have submitted a longer written testimony today. My testimony is my opinion based upon my background and

experience.

Just two weeks ago, I was picking through trash taken from public trash cans and hotel rooms, sorting waste just like you and I throw away every day, into 18 different categories. There is nothing else quite like it -- pizza crust, hotdogs, rice, and yogurt all mixed together with packaging of all shapes and sizes, mostly plastic.

We are working collaboratively with a U.S. community conducting our Circularity Assessment Protocol, so that they can be empowered with data for decisionmaking. The activity of literally digging through and classifying waste really causes you to reflect on what we use, consume, and the waste we generate when we throw something away. It also viscerally brings home the message that the best thing you can do environmentally is not produce waste in the first place. No matter if material is reused or recycled, it all takes effort, energy, and often transportation. So, not having to manage waste at all is best.

I say this for us to keep in mind as we discuss how we manage our waste today -- the logistics, the practicalities, the human dimension, and expenses associated with it -- that not producing it in the first place should be our primary

goal. But the reality is that, even as we move towards circular materials management, which is a critical step towards a circular economy, we will still have waste to manage. And right now, the U.S. leads the world with waste generation.

Globally, 2 billion metric tons of waste is generated. In the U.S., the per-person waste generation is two to six times the waste generation of many countries around the world. While we are the third most populous country, we only have 4 percent of the population, but we generate 16 percent of the world's waste stream; currently, about 329 million metric tons of waste annually.

Plastic in the waste stream has continued to grow by mass from .4 percent to 13 percent now, and the sheer variety of plastic items that can be made, which is often why we utilize the material, creates a multitude of challenges in terms of waste management.

Everyone should keep recycling as best they can, and it gives us all kinds of benefits in terms of carbon, jobs, and the economy. But the reality is, we cannot be saved by recycling as it is now. Our recycling rates have never risen above about a third of our waste stream, and we are currently

at about 25 percent. We have been exporting half of that overseas, which has impacted lower-income countries and, also, was impacted by the ban from China. And we still landfill over half our waste.

The recycle rate is driven by high-value items, with plastics being the least recycled material at about 8 percent. I made a list of the most recycled items reported by the EPA, and I looked at them to see what they had in common. They are either regulated, like lead acid batteries, which are nearly 100 percent recyclable, or sometimes source-separated valuable, and ironically, pretty heavy -- so, cardboard and metals.

Contrary to carbon discussions and light-weighting packaging for transportation, it is the materials that are most dense that have the most value. This is just one example of a tradeoff when examining making changes to our current system.

Life cycle assessments analyze data from cradle to grave in a holistic, quantitative manner and may include things like waste, use, energy, carbon footprint, and other emissions data, but there are some impacts that a product may have at its end of life that are not included. The cost of

management of things like blowing plastic bags in a landfill, downtime at a materials recovery facility, or plastic bags choking turtles and filling the stomachs of whales, those don't fit conveniently into an LCA and illustrate more tradeoffs.

But I am optimistic that together we can collaboratively come up with ideas for change, and here are some to start:

Better data collection. We need standard definitions, methods, and tracking of materials, especially plastic. This seems critical to me to be able to make informed decisions.

Reduce our waste generation. It is not just about personal choice, although this does play a role, but we need to facilitate innovation in businesses to get products to people without producing waste.

The circular economy means changing value propositions, services, and creative use of technology; promoting high-value materials and product designs that are easy to capture and recycle. This could mean some materials and products get banned, fees, deposit/return schemes, or otherwise standardized or regulated packaging. The bottom line is our material and product designers taken end-of-life management into account and, if needed, extend or produce the

responsibility which can be used to promote collaboration and provide resources for infrastructure.

Consider source-separating organic and other materials. Source-separating food waste can reduce greenhouse gas emissions to landfills, and source separation may be needed for cleaner commodities, or at least to remove contaminants from the waste and recycle stream.

Community-based data. Engage our citizens. They need to be empowered with information about their materials flow and waste for decisionmaking. After all, communities are on the front lines of this issue and don't often have a voice.

Input also needs to come from the people that manage our waste daily. And I am glad to see at least two facilities represented here today.

We absolutely need leadership from companies and government. If companies and governments are more thoughtful about products, materials, and waste, citizens will be, too.

Thank you.

[The prepared statement of Ms. Jambeck follows:]

********** INSERT 1 **********

Mr. Tonko. Thank you, Dr. Jambeck.

The chair now recognizes Mr. Zaldivar for 5 minutes, please.

STATEMENT OF ENRIQUE C. ZALDIVAR

Mr. Zaldivar. Thank you, Chairman Pallone, Chairman Tonko, Ranking Member Walden, Ranking Member Shimkus, honorable members of the committee.

My name is Enrique Zaldivar. I am the director and general manager of the Sanitation and Environment Agency for the city of Los Angeles. I report to Mayor Garcetti. I have served in this capacity for over 12 years and have worked in the department for over 30 years.

Thank you for the opportunity to offer testimony on the state of recycling in the city of Los Angeles, as your committee looks at broader aspects of the nation's solid waste management systems. The scope of my testimony is limited to the state of the recycling markets for commodities collected in the city's residential curbside blue bin program, be it aluminum, steel, glass, plastic, or paper/fiber materials.

LA's curbside program is one of the most mature and one of the largest programs in the nation. In operation since the early '90s, LA's recycling system has fully been established and fused into the everyday lives of Angelenos.

The culture of separating and recycling for the greater good of conserving and recovering resources is fully ingrained in the mindsets of Angelenos.

Much as Angelenos do their part on the front end, the processing and marketing systems of the commodities were working equally well on the back end for over three decades, as we have come to rely, perhaps complacently, on China as our single-source destination market. It is well-known that China began restricting the type of recyclable commodities starting in 2013, culminating in a virtual ban of all U.S. recyclables in 2019 under the China Sword Policy.

LA's curbside program collects over 200,000 tons of recyclables per year. Up until 2013, we raised over $4 million a year in net positive revenue from the sale of recyclables. Then, the recycling markets crashed. Last year in 2019, the program cost a net negative $8 million. And this year, we estimate it to close at $12 million net negative.

Using the loss in revenue alone as an indicator, it compellingly points to a state of crisis in the recycling markets. But there is something even greater at risk -- the gains we have made as Angelenos, as Californians, and as

Americans in making recycling and resource recovery the centerpiece of our environmental ethos.

On behalf of Mayor Garcetti and the City Council, I want to be clear that Los Angeles and Angelenos remain unequivocally committed to keeping recycling front and center of our solid waste management system. In fact, Mayor Garcetti's zero waste goal for LA to go landfill-free by 2050 is our roadmap to waste reduction and resource recovery.

Our immediate challenge is to restore stability to our blue bin program, resuscitate and recover the markets for recyclables, and to develop reliable and sustainable markets domestically and within North America; that is, within the U.S., Mexico, and Canada. We cannot any longer rely on overseas markets.

Such an effort requires the full participation of the federal government in collaboration with state and local governments and in partnership with the private sector and environmental organizations, which is why we are so appreciative of your committee in demonstrating the necessary leadership to make this issue of national interest.

I want to thank Congressman Cardenas and Congressman Bucshon for their bipartisan leadership in introducing H.R.

5115, the RECOVER Act, which is an example of the kinds of bills Congress will need to pass in order to support the recycling industry in the United States.

And because the fundamental aspirations of any and all recycling systems anywhere in our nation is to ensure that the recovered resources get reintroduced into the normal channels of commerce, it is critical that the supply industry reach the logistics of commerce and trade to recognize and embrace the importance of recycling.

We recommend that your committee consider an assignment of a recovery fee on products introduced into the marketplace across the country. We also recommend that products brought into the market have recyclability fully considered, if not required, before introduction into the marketplace.

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

[The prepared statement of Mr. Zaldivar follows:]

********** INSERT 2 **********

Mr. Tonko. Thank you, Mr. Zaldivar.

Next, we will go to Ms. Hoffman. You are recognized for 5 minutes, please, with your opening statement.

STATEMENT OF LYNN HOFFMAN

Ms. Hoffman. Thank you, Chairmen Pallone, Tonko, Ranking Members Shimkus and Walden, and members of the committee.

Eureka Recycling is a nonprofit, social enterprise recycler based in Minneapolis, Minnesota, with a mission to demonstrate that waste is completely preventable. We employ 109 amazing people with living-wage jobs who collect, sort, and market 110,000 tons of curbside recycling every year. We have an annual operating budget of $14 million and the two largest residential recycling contracts in the State for the cities of Minneapolis and St. Paul. We are on the front lines of waste reduction, holding a strong belief in our bold vision for a world without waste, while we wrestle with the day-to-day challenges facing recycling today.

The impacts of the National Sword Policy have presented real challenges for us and the communities that we serve over the past two years. We lost almost 50 percent of our revenue, and the cities went from receiving tens of thousands of dollars per month in revenue-share to paying tens of thousands of dollars in additional to cover just the base-

level processing costs.

While very challenging, this time also offers opportunity to rebuild a recycling system that actually delivers on its potential to address climate change, mitigate the inequitable impacts of waste, support healthy regional economies, and good green jobs.

In my written testimony, I share six lessons that we have learned through our experience, three of which I will touch on today, in hopes they will inform the subcommittee's ongoing work in this area.

Lesson 1 is about prioritizing investments. Our domestic recycling infrastructure urgently needs investment. However, we need the right criteria to prioritize where we are spending those much-needed dollars. We need to start with low-hanging fruit, targeting materials that are currently authentically recyclable, in demand, and being lost by the millions of tons to landfills and incinerators.

For example, No. 1, PET bottles like water and soda bottles, highly recyclable and, in theory, in great demand from brands who are making new public comments to use more recycled PET in their packaging. Yet, right now, only 1 in 10 PET bottles are recycled in the U.S., and prices for

recycling PET on the market remain far too low because we are competing with cheap, heavily-subsidized virgin ethylene derived from fracking and other extraction. Policies like recycle content mandates and thoughtfully-designed container deposit legislation are proven solutions to these challenges.

Now, compare PET bottles to other plastics that have less or no value, no end markets, and major challenges to collect and sort, such as No. 6, polystyrene, or No. 3, PVC. Rather than spend the billions of dollars needed upfront to create entirely new systems to recycle these items, a less costly and more effective approach would involve bans and fees to encourage the reduction, redesign, and phaseout of the most problematic materials.

Lesson 2 is who pays. Beyond just prioritizing investments, we need to consider where or who the money is coming from. At Eureka, we just invested $2 million worth of equipment in order for our facility to keep up with the changing composition of packaging that we get, especially the ever-increasing amount of plastic.

Like all the other recycling facilities in the country, we are needing to make investments like these with increasing frequency, making it more expensive to provide the services

our communities require. The burden is falling entirely on the individual taxpayer. As it stands today, producers have no skin in the game when it comes to the end of life of the products and packaging that they create. To remedy this imbalance, we need strong, extended producer responsibility legislation that requires all stakeholders to pay their fair share.

Lesson 3 is that recycling is just part of the solution. Perhaps the most important lesson is we cannot recycle our way out of our consumption and climate crisis. Recycling is one important and viable solution for some products and packaging. However, as Chairmen Tonko and Pallone spoke to, the majority of things we discard, and even recycle, will be best addressed through upstream strategies like reuse and reduction.

According to the World Resources Institute, for every can of garbage at the curb, there are 87 cans worth of waste generated upstream before that product even gets to consumers. The more we buy and discard, and even recycle, the more consumption emissions we generate and the faster climate change accelerates.

With the explosion of emerging technologies, it is also

important to be cautious of false solutions that are sold under the banner of circularity. If a technology ultimately destroys the resource it is processing, such as creating a fuel that will be burned, it is not recycling.

Finally, we are encouraged by the momentum and the interest we are seeing from policymakers in waste reduction. Eureka has contributed to the development and we support the Zero Waste Act and the Break Free From Plastic Pollution Act. These bills and the RECYCLE Act are important pieces of the puzzle, and we stand ready to work with all Members on the diverse array of additional solutions we need.

We are part of a growing community of zero waste advocates and organizations that have been addressing these issues for decades, as well as members of the Alliance of Mission-Based Recyclers who have important knowledge to share and leadership to provide at this critical time.

Thank you very much for your time and consideration.

[The prepared statement of Ms. Hoffman follows:]

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

Mr. Tonko. Thank you, Ms. Hoffman.

And next, we will move to Ms. Patel. You are recognized for an opening statement for 5 minutes, please.

STATEMENT OF DENISE PATEL

Ms. Patel. Thank you, Chairmen Tonko and Pallone, and Representatives Shimkus and Walden, and members of the Subcommittee on Climate and Environment. It is an honor to be here today.

I am the U.S. program director at the Global Alliance for Incinerator Alternatives, a network of organizations working to build zero waste solutions. Our members are primarily grassroots and frontline organizations living near incinerators, waste pickers and workers, and allies in the environmental and social justice movement.

The United States is facing both a climate crisis and a waste crisis. In 2018, greenhouse gas emissions from waste were the sixth greatest source of stationary emissions in the U.S., after petrochemical-related activities, and it is only getting worse.

The combination of cheap new plastic from shale gas and a lack of end markets for recycling has led to more plastic waste going to landfill and incineration. Incinerators emit more greenhouse gas emissions than coal-fired power plants per unit of energy generated. That figure increases when

more plastic is burned.

Incinerators also emit more harmful copollutants than fossil fuel power plants. These copollutants include particulate matter, dioxins, lead, and mercury that are known to cause asthma, cardiovascular disease, developmental disorders in children, and cancers. Seventy-nine percent of municipal solid waste incinerators are located in environmental justice communities which are already disproportionately impacted by pollution. Many are also in desperate need of upgrades and repairs to prevent harmful emissions that are often passed on to local governments, even as they face financial challenges, for waste collection and recycling operations. The toxic ash produced from incineration must, then, be landfilled, adding to the environmental health burden of environmental justice communities, exposing them to more pollution as the ash leaches into local water supplies or drifts into homes with the wind. These same communities are also hardest hit by the impacts of climate change, whether severe storms, deadly heat waves, spikes in food prices, or allergy- and pollution-induced asthma attacks and are less able to deal with these impacts.

Meanwhile, plastic and plastic additives are present in our bodies and have reached the most remote parts of the earth. Yet, faced with an accelerating climate, plastic, and health crisis, fossil fuel and plastic companies plan to quadruple production over the next 30 years, and the remedies they are offering are woefully inadequate. If the business-as-usual approach continues unmitigated, cumulative greenhouse gas emissions from growth in plastic production and incineration alone through 2050 will consume up to 13 percent of the total remaining global carbon budget we have to keep global temperature rise below 1.5 degrees Celsius.

Only 9.1 percent of the plastic produced since 1915 has ever been recycled. More than 15 percent has been incinerated. History shows that we cannot recycle or incinerate our way out of this crisis. We also cannot rely on complicated, expensive, and unproven methods like chemical recycling and plastic to fuel, as the industry suggests. The little information that we do know shows chemical recycling technology is not yet proven to work and is energy-intensive, and produces more greenhouse gas emissions and toxic waste. The recent attention to plastic pollution in the ocean shines a light on the systemic problems of how waste is created and

managed in the United States, but there are real human dimensions to this problem.

Our key recommendations are embodied in the Break Free From Plastic Pollution Act and the Zero Waste Act. In addition to those, I would like to highlight that we would call for a ban on incineration and minimize landfilling to the greatest extent possible, due to their contribution to the climate crisis and disproportionate impact to environmental justice communities. For those same reasons, incineration should never be classified as a clean and renewable energy source.

We agree that single-use plastics and plastics that cannot be mechanically recycled should be banned. We believe that we should reduce plastic production and level the playing field upstream and downstream by halting permits for new and expanding plastic production facilities and ending subsidies to fossil fuel extraction. And we believe that we should incentivize innovation in new reuse and refill businesses and systems across the country, while mandating manufacturers to use high levels of recycled content in new products and packaging.

The reality is that we simply cannot prevent

catastrophic climate change without also addressing the crisis of the waste. We see these two issues as completely in sync. Waste is a byproduct of a system designed for overproduction and overconsumption that is historically dumped on the poor and marginalized, particularly communities of color across America. It is a failed system.

Any new law, policy, regulation, or investment should prioritize the needs and desires of and invest in those communities that have been most impacted by it. And to correct the system, solutions must also aim for zero waste and reject false solutions. Simply put, emissions from waste cannot exist if we don't produce the waste in the first place.

I thank you for your time and the opportunity to speak with you today, and I look forward to the discussion.

[The prepared statement of Ms. Patel follows:]

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

Mr. Tonko. Thank you, Ms. Patel.

Next, we recognize Mr. Christman for an opening statement for 5 minutes, please.

STATEMENT OF KEITH CHRISTMAN

Mr. Christman. Chairman Tonko, Ranking Member Shimkus, thank you for the opportunity to be here today to address this subcommittee on plastic recycling and recovery opportunities.

ACC and our members are deeply committed to ending plastic waste and other waste in the environment and creating a more circular economy for plastics. The benefits of plastics are diminished when it ends up in the environment.

We believe these challenges, while significant, are ultimately solvable. The stakes are high. Plastics are critical to modern society. From lightweight car parts that save energy to insulating our offices and homes, to delivering essential health care, to preserve food and preventing food waste, plastics play an essential role in our society.

Let me start with helping to end plastic waste in the environment. Last year, global companies in the plastics value chain from manufacturer to disposal, including many ACC members, announced the creation of the Alliance to End Plastic Waste. This global, nonprofit organization is

committing $1.5 billion over five years to help end plastic waste in the environment.

Unquestionably, China's ban on imports of plastic and other recyclables has caused significant short-term disruption to our recycling systems, but this disruption has also created a new opportunity to create a circular economy for plastics and other materials. ACC and our members have committed to help create this circular economy. For example, we have committed to reusing, recycling, and recovering all plastic packaging by 2040 and making all plastic packaging recycling by 2030 in the United States. This will take policy, innovations, and investment.

We are now seeing that investment. Since China's Sword Policy was implemented, we have seen more than $4.2 billion in new investments in mechanical and advanced plastic recycling, with potential to convert 6 billion pounds of plastic into new products every year. These technologies offer significant economic and environmental potential. DOE has estimated that one of these advanced recycling technologies, for example, would reduce fossil energy use by 96 percent and fresh water use by up to 58 percent.

Demonstrating the market viability of these projects,

there are now 40 advanced recycling facilities already operational and with more planned. For example, Nexus Fuels in Atlanta is transforming post-use plastics into liquids that are being used by Shell to make a new range of chemicals. In addition, Agilyx and Americas Syrenics in Tigard, Oregon, are currently converting thousands of tons of post-use polystyrene back to styrene for new plastics. And Brightmark Energy expects their new $260 million advanced recycling facility in Ashley, Indiana, to be operational by the end of 2020. It will convert 100,000 tons of plastics into products. ACC projects that the U.S. could support 260 advanced recycling facilities, generating nearly 39,000 jobs and $9.9 billion in economic output.

In addition to our efforts to help end plastic waste in the environment, we believe policy is important. ACC and our members support the bipartisan Save our Seas Act, both 1 and 2.0, as well as the RECOVER Act, the RECYCLE Act, and the PLASTICS Act.

We would particularly like to thank full committee members Tony Cardenas and Larry Bucshon for introducing the RECOVER Act. The RECOVER Act establishes a recycling infrastructure program within EPA.

The RECYCLE Act will improve recycling education. Studies show that about 25 percent of recyclable materials are lost due to lack of knowledge.

While ACC strongly supports efforts in plastic waste and the environment, and improved circularity, ACC must oppose proposals that would ban many plastic products or impose a moratorium on new plastic facilities. These proposals would increase environmental impacts by switching to alternatives. For example, the environmental accounting firm True Cost recently found the environmental cost of alternatives to plastics across 16 consumer goods sectors was four times greater than the environmental cost of plastic.

In conclusion, the American Chemistry Council is working to end plastic waste in the environment and to create a circular economy for plastics.

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

[The prepared statement of Mr. Christman follows:]

********** INSERT 5 **********

Mr. Tonko. Thank you, Mr. Christman.

We next recognize Mr. Johnson for an opening statement for 5 minutes, please.

STATEMENT OF WILLIAM H. JOHNSON

Mr. Johnson. Thank you very much, Mr. Tonko, and good morning to you and to Mr. Shimkus. It is an honor to be here before you to discuss the important role of recycling in our society.

Recycling in the United States is an important economic engine, job creator, and environmental steward. The recycling industry directly employs more than 164,000 Americans while generating $110 billion in economic activity. These numbers tell a story of a strong U.S. recycling industry, but not one without challenges in key segments. To understand these challenges, it is important to first understand what makes for successful recycling.

First, successful recycling requires market demand. If there is no end market to utilize the recyclable materials that are collected, they will not be recycled and used again in manufacturing. And collection without market consumption is not recycling.

Second, successful recycling requires minimal contamination as recyclables are products sold by specification grade with their corresponding value and

marketability directly related to quality.

Recycling in the U.S. involves far more than what is placed in the blue bin. The recycling infrastructure in the U.S. touches almost every part of our economy from retail stores, office complexes, residential neighborhoods, schools, factories, and even military bases.

The vast majority of the recyclable material that flows through the recycling infrastructure does so without any problems and is transformed by recyclers into clean, high quality, commodity grade materials used globally in manufacturing.

Specifically, what makes the residential stream so different is that, while it is subject to the same demand-driven end markets, it is saddled with an ever-changing mix of materials on the supply side, and that material flows through into the stream, whether there is a market for it or not. This sets the residential recycling infrastructure apart from commercial and industrial recycling in the U.S., and that is why it demands a unique approach.

Because of the challenges being experienced in the residential recycling infrastructure, we are seeing a growing loss of confidence in recycling on the part of the general

public, which is of great concern to all of us in the recycling industry.

First, recycling does work, although it is not without challenges. Our country's recycling infrastructure processes more than 138 million tons of recyclables annually. However, residential recycling only is about 30 percent of that. The other 70 percent comes from recycling of commercial and industrial materials that tends to be cleaner.

Second, there is no one singular solution to the challenges we are experiencing in the residential recycling infrastructure. The residential recycling chain and associated infrastructure in the U.S. is a complex system which is driven by market demand, but saddled with a supply chain that is generally not linked to current market conditions.

There are four major pressure points that we see in the current residential recycling infrastructure.

The first point is right before the material enters the recycling stream, when the decision is made whether to put an item in the bin, and that is where education can play a very important role.

The second pressure point is between the municipality

and the MRFs, or the materials recovery facilities, where there is a need for contracting policies and procedures that provide flexibility for market fluctuations.

The third pressure point is processing where, despite investments that are already being made, there is a need for additional upgrading of equipment and facilities.

The fourth pressure point is at the point following processing when the recyclables enter the end market. This is where market development is needed.

At ISRI, we believe that all stakeholders must come together to develop a common understanding of the weaknesses affecting the residential stream, and then, work together to develop a menu of solutions that need to be put into place.

Thank you for this opportunity to illustrate the complexities of the recycling systems.

[The prepared statement of Mr. Johnson follows:]

********** INSERT 6 **********

Mr. Tonko. Thank you, Mr. Johnson. And again, thanks to each and every witness for your opening statements.

We will now move to member questions, and I will start by recognizing myself for 5 minutes.

Dr. Jambeck, I was interested in the charts in your testimony showing recycling rates for different types of products. Granted, there are different environmental risks and volumes of materials, but it seems that we have figured lead acid battery recycling. Can you help us understand the major factors in recycling rates? What makes some products so high compared to others?

Ms. Jambeck. Sure. That is a great question.

So, what I did was make this chart specifically of items that were very highly recycled and, then, sort of make some notes. Lead acid batteries are very regulated, and they are required to be brought back and recycled, and places are required to have the facilities to do that. In other cases, these are high-value materials and, as I said, they are often heavy. They have substance, right? So, metals and cardboard. Cardboard is often source separated. So, a lot of companies get cardboard in and it remains very clean, and then, it has a higher commodity. Steel and aluminum are very

easy to separate at an MRF with magnets or eddy current separators. So, the technology is there.

As we get to kind of lower rates, we can kind of see plastic itself gets very hard to separate. It gets mixed with paper. Paper itself can get contaminated by other items. But the two highest items I wanted to point out in plastic are HDPE, which is clear milk jugs and it specifically said "clear" because, of course, that has a higher value because it can be colored and reused, and PET, which was mentioned here as well, again, sort of a heavy substance.

So, I think when we look at this, and when we think about design of materials, it is actually the substance that can have more value and makes it recyclable.

Mr. Tonko. Now we know the state and local roles in recycling, but what types of policies could the federal government consider to help improve these rates?

Ms. Jambeck. I think that if something doesn't have inherent value, as we sort of talked about here, then a very thoughtful container deposit/return scheme that was brought up even by Ranking Member Walden here for Oregon. So, those kinds of schemes give values to items, so that they will come

back into the system.

Mr. Tonko. And what is the right balance between sticking to incentivized better markets for some of the lower-value materials versus incentivizing manufacturers to consider using different materials from the outset?

Ms. Jambeck. That is a great question that I think involves looking at tradeoffs a bit holistically. But, certainly, there are materials and products that require redesign, I think, to actually enter the system, and some of them that may not be worthwhile at all with a circular system.

Mr. Tonko. Thank you.

Mr. Johnson, your testimony suggests that design for recycling could continue to be an important part of the solution. Do you believe manufacturers are giving this concept greater consideration today?

Mr. Johnson. Yes, I do. In fact, we give an award every year for companies that design their products to be recycled and considering reducing toxic materials in them; and also, considering the ways that those products will end up being recycled, being broken down, and how that happens. So, yes, they do, and we have awarded our award for over 20

years to a variety of companies from electronics to chair manufacturers, and on and on.

Mr. Tonko. How much more can be done to improve recyclability in the early stages of product and packaging design?

Mr. Johnson. Oh, I think quite a bit. And I know that the companies are working on it. Their customers are demanding it right now. And so, I think that is going to speed their motivation up quite a bit.

Mr. Tonko. Mr. Zaldivar and Ms. Hoffman, can you give us a sense of how the economics of local recycling programs have changed since China's National Sword Policy went into effect?

Mr. Zaldivar. Certainly for Los Angeles, Chairman, we have gone negative. It has become a cost, all burdened by the ratepayers. Clearly, the value of the recycling commodities as a whole has gone negative. And so, there is just no financial incentive now for seeking revenue from the recyclables, which is why my call for urgency to recover the markets.

Mr. Tonko. Thank you.

Ms. Hoffman?

Ms. Hoffman. I can give a few specific examples maybe about commodities. In particular, cardboard has decreased for us from 2018 being at $91 a ton to now about $45. Aluminum has decreased from about $1600 a ton to about $1,000 in that same time period. Our entire basket value, meaning the average kind of scoop you would take out of the pile, that value has gone down from $72-73 to about $48 in that time period.

Mr. Tonko. Thank you very much.

I will now recognize Representative Shimkus for 5 minutes, please.

Mr. Shimkus. Thank you, Mr. Chairman.

I see Scott has his metal water bottle prominently displayed. We have a plastic pitcher here, and we have a non-recyclable cup, and I am using these two.

I am pro-plastic. Okay? Plastic is a material consisting of any of a wide range of synthetic or semi-synthetic organic compounds that are malleable and can be molded into solid objects. That is the definition of it, and it has made our lives better in this process. So, any move to ban plastics in our society would meet with, I think, a lot of objection throughout our society.

And let's talk about this China National Sword Program. Mr. Johnson, why did China institute this policy?

Mr. Johnson. There is a couple of reasons. The first one was a reputational issue with China, that they felt that they were getting trash and lower-quality material. They were also trying to eliminate corruption in their country by restricting this material. And lastly, they are developing their own domestic recycling infrastructure there. So, there is really sort of three major reasons why they did that.

We look at it as a wake-up call to the United States and to our residential recycling programs to improve our quality of the material that we are getting in here. And that is going to be, again, educating the public about what to put into the bin and what not to put into the bin. That might even be more important as to what not to put into the bin and to get a higher quality material, which will raise the price and also having more recycled content in new products.

Mr. Shimkus. So, I think most of the panelists have said, obviously, China's National Sword Program has been a wake-up call for all of us to try to do a better job, get better material, source it better.

Mr. Johnson and Mr. Christman, there is legislation

introduced in the House and Senate that would authorize grants to states, local governments, and Indian tribes, nonprofits, and public-private partnerships to educate and inform consumers about residential and community recycling programs. I would assume you would agree that that is a good idea. Mr. Christman?

Mr. Christman. Yes, we support that.

Mr. Shimkus. Mr. Johnson?

Mr. Johnson. Yes. In general, yes.

Mr. Shimkus. And most Americans think of recycling in terms of blue curbside bins, as has been mentioned here before. And while individual consumer actions are noble, the reality is most recycled material comes from commercial and industrial stakeholders. Can you briefly speak to the quantity of recyclable material we are talking about in terms of curbside versus commercial. Let's start with Mr. Johnson with the association.

Mr. Johnson. Certainly. Well, it is about 138 million metric tons of materials processed in the United States, and as I said, it is about 30 percent of that is from the residential stream; 70 percent comes from the commercial and industrial recycling.

Mr. Shimkus. Mr. Christman, do you want to add anything?

I mean, one of my roles in the Recycling Caucus is to make sure that that part of that story is told. All my colleagues, we all visit manufacturing facilities. And a good manufacturing facility is going to trim the metal and throw it back into the bin and remelt it. A good plastic company is going to trim off the little nubbies and stick them back into the feeder to recreate the same bottle that the original pieces were going to be involved with. So, we do appreciate it.

Let me go to Ms. Hoffman. Your organization is a not-for-profit?

Ms. Hoffman. That is correct.

Mr. Shimkus. So, in your testimony you talked about, in essence, baking in some more cost in this process. My question is, why haven't you done that in your bid proposals for the recycling efforts that you have in the Twin Cities?

Ms. Hoffman. That is a good question. I think the average contract period is typically five to seven years when you sign a contract with the city. And so, the National Sword has impacted and changed the markets in a way before

contracts were able to be renewed. I think we are seeing a big shift in the marketplace. Again, as I mentioned before, I think cities will bear the burden of the increased cost to produce quality recyclables and to operate in this marketplace as it is.

Mr. Shimkus. Yes, some contractual obligations have clauses -- and I am not a lawyer and I don't write them -- but externalities; when there are other pressures placed on, then you can go and renegotiate the contract.

Ms. Hoffman. Yes. I mean, that is part of what the revenue-share model is in our contracts, too. So, there is shared risk and reward in high and low markets.

Mr. Shimkus. Thank you. I appreciate you all being here.

And I yield back.

Mr. Tonko. The gentleman yields back. The chair now recognizes Chairman Pallone of the full committee for 5 minutes to ask questions, please.

The Chairman. Thank you, Chairman Tonko.

I wanted to ask some questions about the plastic waste crisis, because I do think it is a crisis. And maybe what I will do is just ask each of you to answer yes or no to this

first question, going down the line.

Do you believe that we can effectively address our plastic waste crisis without reducing the amount of plastic we produce in the first place? Just yes or no, starting with Ms. Jambeck. No?

Ms. Jambeck. No.

The Chairman. Okay. Mr. Zaldivar?

Mr. Zaldivar. It is possible.

The Chairman. Okay.

Mr. Zaldivar. It is possible.

The Chairman. All right. Ms. Hoffman?

Ms. Hoffman. No, I don't.

The Chairman. Okay. And then, Ms. Patel?

Ms. Patel. No, I don't.

The Chairman. And, Mr. Christman?

Mr. Christman. Yes, absolutely.

The Chairman. And, Mr. Johnson?

Mr. Johnson. Yes, I think it is possible.

The Chairman. Okay.

Mr. Johnson. I hope it is, too.

The Chairman. What did you say, Bill?

Mr. Johnson. I hope it is, too.

The Chairman. Okay. I think that addressing this plastic waste crisis is going to require efforts to reduce the waste stream, not just recycle it. That is my view. And I think we have to learn from our past experience with recycling and avoid relying again on strategies like exporting contaminated materials, which allowed us to ignore our waste without actually addressing it.

And again, our patchwork of recycling programs creates confusion for consumers. Particularly the move towards single stream recycling has, I think, made it easier for consumers to recycle, but harder for processes to manage the waste system, especially when unrecyclable materials inadvertently wind up in the recycling bins.

So, let me go back to Dr. Jambeck. How can we improve science and tracking to ensure we are actually addressing the waste we produce?

Ms. Jambeck. Yes. So, I have seen a few programs throughout the world in terms of tracking materials better. Some of them include RFID tracking of materials, which we have done here. In some cases when people get their waste collected at their home, there was a program called Recyclebank, and that was sort of credited to those people.

I think, in general, I would love to see more collaboration about understanding how much material we are wasting and using. As we do science looking at potential mitigation options for this, it has been hard to get actual quantities of materials that go into certain products, and then, the use of those products, and then, the waste stream. We have different metrics -- count, mass. So, all of those have been a little confounding as we have tried to do science around this issue.

The Chairman. Okay. Ms. Hoffman, you referred several times in your testimony to materials that are authentically recyclable. And I think that term captures the disconnect between what we thought we were recycling in the past and what was just being dumped. Are there any strategies being used or discussed in the recycling arena today that you see as inauthentic?

Ms. Hoffman. Certainly. Yes, I think that there is a disconnect that I think we an address between the production of materials and the end of life. I think there is a misunderstanding that, if you make a product out of a technically recyclable material, that that means it will, then, in fact, be recycled. But there are so many other

factors that need to be considered in terms of its ability to be collected, to be sorted, how it impacts existing infrastructure, how it behaves in the equipment.

So, for example, we often will get expanded PET insulation that goes into kind of meal crates made of PET, No. 1. It says on there, "Please recycle." But our PET markets don't want it. It is flat. It ends up in the paper in our process. It is very hard to remove. So, I think there is a difference between technically being recyclable and actually getting recycled, and that is where we need manufacturers and producers to be more involved and engaged in the design.

The Chairman. All right. Thank you.

My next question is, what is the most important thing the federal government can to do to modernize our outdated recycling system? I don't think I am going to get a response from more than one. So, let me go on the other end here. Mr. Johnson, what do you think we should do to modernize our recycling system?

Mr. Johnson. Well, there is a lot of new technologies that are coming onto the market. And so, there can be things like business incentives, tax incentives for businesses to,

for the recyclers to incorporate those new technologies, would be the first one.

Also, encouraging, through other types of incentives, for manufacturers to design their products to be recycled; to use more recycled content in their products. And those should be some quick ones to help.

The Chairman. All right. My time is up. Thank you, Mr. Chairman.

Mr. Tonko. The chairman yields back. The chair now recognizes Representative McKinley for 5 minutes, please.

Mr. McKinley. Thank you, Mr. Chairman.

I ran across an article the last few days from the Institute of Animal Health, and it was an interesting quote that he said. According to their group, "Plastic is leading our present civilization towards extinction." And that concerns me, that kind of statement, because I think that epitomizes the hysteria that seems to be emerging over the use of plastics.

In my district in northern West Virginia, we are experiencing a shale gas boom with Marcellus and Utica. And we developed this. This resin comes from gas. And from that, from this product, we get a listing of furniture parts,

fibers, carpeting, Plexiglas, lenses, light fixtures, phones, food packaging, diapers, siding, pantyhose, insulation, coating. All that has transformed our economy, made us a stronger nation as to what we are.

I don't want to go back a hundred years before we were using plastics. I don't want to go back to that. And so, what we are talking about here is that what Congress is being encouraged to do is either to ban plastics or to discourage their dependency. I am hearing that from this panel and some of the articles that we read leading into it.

But what I don't understand is why we are not unleashing the potential of innovation in America to find other ways of dealing with it, whether it is bioplastics, biodegradables, something other than this simplistic way of just, well, if we don't like it, we will just ban it.

And we have seen this time and time again here in Congress in my 10 years here. We have considered, during that time, we tried to ban fly ash, vaping, fossil fuels, formaldehyde, microbeads, herbicides, pesticides. Some are considering even banning air traffic as a way to deal with some issues.

My point, just because we can doesn't mean we should. I

think we have to be careful about what we are approaching on this because other nations are doing the same thing. Not everyone comes to the same conclusion as to the results of plastic. What Europe is doing in some things, we don't do. Our scientists, people will say, "I am a licensed engineer." That is like yourself on this. So, we talk about how do we deal with it. But you can give the same scientists the same information, just like attorneys, if you give three attorneys the same information, you get three different opinions. I think the same thing applies here.

Because in Europe they are still using foam insulation. It is one of the most efficient ways of saving energy consumption, but, yet, in America we have banned that. We have got food dyes that we use in America that are prohibited to be used in Europe. I just know that there is not a clean answer with this.

So, what I want to do is focus on innovation. And so, I don't want us to go back in time on this. As for the recycling issue, it concerns me because I come from a rural area. And in a rural area, we don't have -- this is not New York, Pennsylvania, or Chicago. These are little towns. I just listed five communities -- Farmington, Blacksville, Paw

Paw, Barrackville, and Fairview. The total population in those communities don't have recycling and they have less people in those five communities than are in this office building, the Rayburn Office Building. But, yet, we are saying, "Recycle." How do they do that? They are not going to be able to do that.

So, I want to see us focusing, and my question -- unfortunately, I have used too much time in leading up to it -- is, how do we get to where we go to biodegradable materials, using that so that these materials can be disposed of and we can continue creating jobs? We can still create the natural gas and using that. I know Colorado State is working on it. Colorado State University is working on that.

Mr. Christman, if I could, what research, what is being done to be able to allow these materials to degrade?

Mr. Christman. Yes, thank you. Thank you, Congressman.

Our companies are working on biodegradable and bio-based materials. They are doing a lot of innovation and research around the potential to use biodegradable materials.

The challenge, though, is that there is no one environment when it comes to biodegrading materials. Folks have talked about biodegrading in the environment or

biodegrading in the ocean. There is no one ocean. Ocean temperatures vary dramatically and materials generally don't degrade in the ocean or in the environment.

People will talk about compostable materials. And compostable materials are different. They need industrial composting facilities generally with high temperatures that aren't widely available in the United States at this point.

Mr. McKinley. I see my time has expired. So, I yield back.

Mr. Tonko. The gentleman yields back. The chair now recognizes Representative Peters from California for 5 minutes, please.

Mr. Peters. Thank you, Mr. Chairman, and thank you for having this hearing.

And thank you to Ranking Member Shimkus for your commitment to improving our recycling system and for noticing my San-Diego-branded water bottle, because I always have one.

As many people know, California has been a leader in reducing waste and plastic pollution. Several of the largest cities in the State, including San Diego, which I represent, have taken bold action to increase recycling rates and reduce waste in our communities. And I am pleased to see Los

Angeles represented at today's hearing and appreciate Mr. Zaldivar's testimony on the efforts underway under your leadership. Thanks for being here.

And a lot of members have already touched on how to improve the recycling system here, the conditions of the market.

Ms. Hoffman, your testimony emphasized, quote, that "we need to be smart about creating the right criteria to prioritize where we are spending these much-needed dollars." End quote. What do you think are the right criteria?

Ms. Hoffman. Again, I think we need to look outside of the economics of these materials, and we certainly need to look at the practicality, the sortability, the collection. But, then, I think we also need to draw the circle around human health impacts, on the extraction, the creation, even the recycling of those materials. Recycling is not impact-free.

Mr. Peters. So, upstream kind of impacts?

Ms. Hoffman. Upstream, yes.

Mr. Peters. Okay.

Ms. Hoffman. Absolutely.

Mr. Peters. And I want to say how much I enjoyed, Dr.

Jambeck, your testimony. I practiced law before I came here, and I practiced solid waste law. And I knew what you meant when you said "MRF". It wasn't my average drinking buddy. So, it is fun to hear about that, and, also, the archeology of waste is interesting, too. So, I appreciate your work.

I wanted to ask Mr. Christman a question about something that you said. You were talking about the alternatives to plastic, and you said that you thought the alternatives might have worse environmental effects than the plastics themselves. Can you flesh that out for me, explain what you mean?

Mr. Christman. Sure. When you look at the alternatives, when organizations have looked at, done the research on the full cradle-to-grave of products, they have considered all the various environmental impacts, greenhouse gas emissions, for example. In fact, the Oregon Department of Environmental Quality has done this for shipping bags and envelopes for shipping soft goods. And they have looked across the different things that could be used -- paper, plastic -- and actually concluded that plastic had by far the lowest greenhouse gas emissions and energy use associated with shipping products.

Similarly, if you look at coffee, coffee can be put in a -- it was previously put in steel cans. Today, we often find it in multilayer plastic-wrapped products. You use a lot less material in that multilayer plastic wrap, and the greenhouse gas emissions associated with that plastic wrap are one-quarter that of the steel can, even though that steel can has an 80 percent recycling rate and that plastic multilayer material today is zero percent recycling rate. So, that is the kind of thing we need to look at when we consider recyclability and other things.

Now we are working to take that coffee packaging and make it recyclable also. That is our goal, and by 2030, all plastic packaging will be recyclable in the United States.

Mr. Peters. What research are you familiar with into this -- this probably isn't in your interest -- but into substitutes for plastic, other than the old ones like steel?

Mr. Christman. Well, the substitutes for plastic, we often hear about compostables, particular for food service. But the challenge is you also have to match that up with infrastructure.

Mr. Peters. Right.

Mr. Christman. And to have a composting infrastructure

widely available, that might be something that is useful for food service. But, today, composting infrastructure isn't widely available. It is only practiced widely for collection with food materials in Seattle and San Francisco, and a few other isolated communities, but most places don't have that kind of infrastructure. So, you can't get that benefit from that product.

You need to think of this as an entire system of products. We are focused on making ours more recyclable, building out the modern, advanced recycling facilities for plastics and turning them back into plastic raw materials that can be reused again in a circular economy.

Mr. Peters. Okay. I appreciate that very much.

And I yield back. Thank you.

Mr. Tonko. The gentleman yields back. The chair now recognizes Representative Long for 5 minutes, please.

Mr. Long. Thank you, Mr. Chairman.

And thank you all for being here today.

Mr. Christman, some of the witnesses we have heard from today have suggested a need to support proposals of Congress that would ban the manufacture or use of plastic. The main reason that they cite is environmental protection. What is

the alternative to plastics, and would those alternatives be a net positive or negative for the environment?

Mr. Christman. There are a range of materials we use across society, usually metals, paper, and those are the primary materials we use as a society. When you look across the alternatives for 16 consumer goods sectors, an organization called Trucost has done that and concluded that the alternatives tend to have four times higher of the environmental impact across greenhouse gas emissions, energy use, and even marine litter.

And the reality is that that comes from the fact, when you are looking at alternative materials, generally, they use four times more material in the first place. They weigh four times more. It is basic physics. And that is why the alternatives often have higher environmental impacts.

Mr. Long. Okay. Are you familiar with these new straws that they have come out with, these biodegradable, plant-based straws, and that type of manufacturing?

Mr. Christman. I am familiar with those, and I actually weighed some of them. And they weigh about three times as much as the plastic straw. So, you are using three times more material. I have also heard people refer to using their

paper straw and having it fall apart in their drink, and then, having to get another straw. That, clearly, is not the goal we want to achieve because you are using more material in the first place.

What we want to see happen with straws, for example, is a straw-on-request approach, where people who don't need a straw don't take one. But if you would like a straw or if you have special needs and need a straw, you are able to get one.

Mr. Long. I think that is what we have got already. Every restaurant I go into, you have got to beg. You have got to beg for a straw.

[Laughter.]

One waitress handed me a paper straw, and it was wrapped in paper wrapping as a plastic straw comes. And she said, "Now be careful when you open that because it is paper." And I am like, yes, be careful, and then, don't put it in anything liquid.

[Laughter.]

What we know is that the best way to a healthy environment is through technological innovation. What sort of innovations are happening in the plastic spaces that can

make them reusable and more environmentally-friendly?

Mr. Christman. The advanced chemical recycling of plastics is the innovation that we see happening dramatically across the United States. There has been about $4.2 billion in investment in these new kinds of facilities. The hope, or the developments in these facilities, is that they are going to be able to take plastic back to its raw materials and convert it back into brand-new quality plastic.

One of the challenges in reusing many types of plastic previously, it has been tough to convert it back into food grade material that could be virgin quality. This new technology offers the ability to get back into those kinds of applications. In addition, we do see new opportunities around design.

Mr. Long. Technology to convert it into feedstocks?

Mr. Christman. Absolutely. Absolutely.

Mr. Long. Okay. Mr. Johnson, why we do we export so much of our recyclable materials overseas?

Mr. Johnson. Thank you, Mr. Long.

Because in the United States we consume as much, our manufacturers here consume as much as they possibly can of the recycling, and the export markets are there to pick up

the other about 30 percent of what we don't consume here in the United States. Otherwise, there would be no other market for that material.

Mr. Long. Okay. Is there a big opportunity here in America to recycle these materials and contribute to saving the environment and boosting our economy?

Mr. Johnson. Oh, sure. Sure. What I mean by why it is exported in that case is that they are globally-traded commodities, whether they come from the United States or some other country. We export to about 150-plus countries around the world every year. And they buy from the United States because of the high quality of the material that they are getting from us.

Mr. Long. Okay. And once again, thank you all for being here today.

And, Mr. Chairman, I yield back.

Mr. Tonko. The gentleman yields back. The chair now recognizes the gentlewoman from Delaware, Representative Blunt Rochester, for 5 minutes, please.

Ms. Blunt Rochester. Thank you, Mr. Chairman.

And thank you to the witnesses for being here today. Excuse me. I am in between two hearings at the exact same

time, but I am glad to have you before us.

Reducing plastic waste is something that is extremely important to Delawareans. I am proud to say that Delaware recently became the fourth state in our country to pass a ban on single-use plastic bags, which will go into effect January 2021. This new law fits into our governor's Keep Delaware Litter Free Initiative.

Just last week, I spoke on the phone with Haley from Wilmington, a fourth-grader who wrote into my office about plastic and our oceans and how it affects the planet. We have a shared commitment in our State to protect our beaches, parks, and outdoor space that makes our State so special.

That is why I am a co-sponsor of H.R. 5845, the Break Free from Plastic Pollution Act, led by Mr. Lowenthal of California. And that is why this hearing is so important to me today.

My first question is to Dr. Jambeck. Relying more on compostable materials is one way we can design products with less waste, but we also hear the term "circular economy" quite a bit. Can you please explain briefly what the term "circular economy" means?

Ms. Jambeck. Sure. So, I would say the circular

economy is not just about recycling. I tend to call that circular materials management. And every output can become an input. But I think a circular economy is more than that. It is a bigger picture. Can we figure about how to get products and materials to people without producing waste in the first place? Can we facilitate new value opportunities, new business norms? Thinking about innovation, I think sometimes if we actually constrain ourselves, innovation pops up even more. And I find this as an engineer, right? We have to have constraints, and then, people get really creative.

So, mobile dishwashing units, so people don't have to use disposable goods; cup-sharing programs with RFID technology, things like that.

Ms. Blunt Rochester. Mobile dish units, talk about that for a minute.

Ms. Jambeck. So, if you don't have enough space to have a kitchen where you can wash dishes, then there are people who are coming up with ideas about how to have a mobile dishwashing unit, so you can basically rent out dishes or provide a service of washing those dishes. So, you can do reusable, but you don't the space for that.

Ms. Blunt Rochester. Got you. Got you. And you were giving a couple more examples.

Ms. Jambeck. Yes. Well, I think that was basically it, just thinking about how we can sort of keep our same lifestyle and use technology creatively to basically not produce waste.

Ms. Blunt Rochester. Excellent, excellent.

And, Ms. Hoffman, my sense is that Eureka Recycling is focused, in part, on creating the type of circular economy that Dr. Jambeck was just describing. Can you please explain how your organization works with the communities you serve to make that vision a reality?

Ms. Hoffman. Yes, absolutely. Thank you, Ms. Blunt Rochester.

We think that circularity is one description of the economy that we need to build, but we also need to look at toxicity; we need to look at equity; we need to look at stable climate. So, circularity for the sake of circularity, it is not the right question, and it can lead us down the wrong path if that becomes our Holy Grail.

So, we are working with our community to look holistically at waste reduction. And so, our strategies are

not just about emptying the trash can, but looking at the impacts of all of our consumption and solutions that we are innovating.

Ms. Blunt Rochester. Excellent, excellent.

This question is both for Dr. Jambeck and Ms. Hoffman. How can the federal government incentivize the kind of conversation that we are having right now in terms of a circular economy and waste reduction, and really looking at this more comprehensively?

Ms. Jambeck. So, I had a few ideas in my testimony. And I think, looking at sort of laws and regulations that sort of impede some of this business innovation, I think incentivizing this kind of business innovation maybe with some tax incentives. I mean, we even talked about that for recycling infrastructure, but, also, I think for the creativity around, again, not trying to produce waste while we delivery products and services to folks.

And then, if you want to, then, get closer to the circular materials management, which is a component of the circular economy, we could look at the deposit/return schemes, various product redesign, material substitutions, really trying to look at getting rid of materials that don't

fit into that circular assessment as well.

Ms. Blunt Rochester. Excellent.

Yes, Ms. Hoffman?

Ms. Hoffman. I would agree with everything Dr. Jambeck said, and maybe just add that we often talk about needing to go upstream and look at standardizing materials. If all the producers of toothpaste had to play by the same rules, it would make it much easier to manage toothpaste tubes on the back end, for example. So, those kind of policies and regulations.

Ms. Blunt Rochester. Thank you so much, both of you.

I did want to share that an effort was led in our State legislature by Representative Frank Cooke to limit the height of landfills and we just passed legislation recently. So, we are very proud of that as well.

With that, I yield back the balance of my time, which I have none.

Mr. Tonko. The gentlewoman yields back no seconds. We now recognize Representative Matsui of California for 5 minutes, please.

Ms. Matsui. Thank you very much, Mr. Chairman.

I want to thank the witnesses for being here today.

Dr. Jambeck, you are an expert in solid waste management and have extensive background in researching how plastics, in particular, make their way into our oceans. In an annual report in 2017 by the Ocean Conservancy, data demonstrated that the top 10 most commonly-found items on beaches were all made of plastic. This finding was repeated in 2018. What are some of the examples of these items and how does this inform policy decisions?

Ms. Jambeck. That is a great question. Some example of those items are plastic water bottles, straws, plastic bags, bottle caps, cigarette butts.

Ms. Matsui. Okay.

Ms. Jambeck. So, I think those are great. And so, I even talk about in my testimony looking at what leaks out and ends up on the ground, and this is a part of the research that we do. Then, you ask, what is this item, why is it here, and what can we do about it? And that can, then, inform upstream solutions. So, really collecting data just like the Ocean Conservancy does on that is critical, I think, to upstream solutions.

Ms. Matsui. Upstream and the impact of these plastics on the marine ecosystems, right?

Ms. Jambeck. Of course, yes.

Ms. Matsui. Okay, okay. Now plastics break down into tiny pieces, referred to as microplastics. In Monterey, scientists have demonstrated how microplastics are found not only on the surface of the ocean, but at much lower depths. They actually found that most plastic is below the surface, making it hard to measure the extent of the problem. How do microplastics that make their way into the ocean ultimately come back to pose public health risks?

Ms. Jambeck. Yes, we are really finding plastic everywhere we look, and there is only a tiny portion floating on top of the ocean compared to what we estimate going in every year. We do find it in our air. We have found it in food products, in drinking water, in seafood. We don't really know what those impacts are on us yet in terms of consuming that material. And so, really, that is the cutting edge of research in terms of what are the human health impacts from being exposed to this ubiquitous --

Ms. Matsui. Okay, but only do plastics impact the health of our environment, marine wildlife, and our communities, they are detrimental to our efforts to prevent further warming of our planet. Dr. Jambeck, do plastics

exacerbate climate change, yes or no?

Ms. Jambeck. Ooh, that is too complex for me to give a yes or no.

Ms. Matsui. Really?

Ms. Jambeck. Yes, because there are so many tradeoffs that can affect it.

Ms. Matsui. Okay.

Ms. Jambeck. As a scientist there, I haven't crunched that number to give you a complete --

Ms. Matsui. Okay. Well, according to the Center for International Environmental Law, annual emissions from the plastic life cycle result in the equivalent of what you could see from 189 coal-fired plants in 2019, and by 2050, the greenhouse gas emissions from plastics will reach over 56 gigatons, or 10 to 13 percent of the entire remaining carbon budget.

Now I would like to say that communities are stepping in, devising their own strategies to reduce waste production in California. In fact, the San Francisco International Airport instituted a ban on plastic water bottles, and I think we see that coming throughout the country.

Also, you mention in your testimony that one solution is

better tracking of plastics from the time they are created until when they are ultimately disposed of. How do you propose going about doing that?

Ms. Jambeck. So, I think there are various ways. I think partnering with industry to know about how much plastic is manufactured, we have some good data around that. And then, when we look at estimates in terms of use and where it ends up in the waste stream, we have some gaps there, in particular, what items are created, how many are used. But I have seen other ways of tracking material with RFID, not necessarily embedded in every plastic component, barcode scanning. I mean, we do collect data on a lot of these materials in a lot of ways, and I know it exists, but it is not always easy to access.

Ms. Matsui. Okay.

Ms. Jambeck. So, a bit more open data there.

Ms. Matsui. So, Mr. Zaldivar, last month, members of the California Association of Sanitation Agencies met with my staff to discuss issues related to the problems caused by the flushing of single-use disposable wipes down the toilet, not the best thing to think about now. While not common knowledge, most of these wipes are made with plastic material

and cause major issues for wastewater treatment infrastructure. Confusion on how these products are advertised, including labels calling them flushable, only adds to the problem. Indeed, my constituent water treatment agency has had to foot the bill for managing the problem which costs California agencies millions in maintenance and infrastructure upgrades every year.

What are some of the impacts of flushing disposable wipes into the sewer system? And I only have like 12 seconds here.

Mr. Zaldivar. Labeling consistency is very important. As you brought up, the flushable wipes do cause serious problems in our wastewater system, with causing havocs with spills, which contaminate the beach; cause incredible impact to the communities. So, I think having the labeling be more truthful is important and finding alternatives, so that we, in fact, have soluble products that will dissolve in the water.

Ms. Matsui. Right.

Mr. Zaldivar. Because, clearly, the need is there.

Ms. Matsui. Okay. Thank you very much.

And I ran out of time. I yield back. Thank you.

Mr. Tonko. The gentlewoman yields back. The chair now recognizes the gentleman from Georgia, Representative Carter, for 5 minutes, please.

Mr. Carter. Thank you, Mr. Chairman.

And thank all of you for being here, ladies and gentlemen.

I have the honor and privilege of representing the 1st Congressional District of Georgia. That includes the entire coast of Georgia, over 100 miles of pristine coastline that we are very proud of and want to keep clean. One of the problems we have, of course, is plastics and what is happening.

I know, Dr. Jambeck, that the University of Georgia is doing extensive research on this. And "Go Dogs". Thank you for what you are doing. We appreciate that.

But this is very important. It is important to our economy. We depend on seafood. We depend on tourism. We depend on our ports. All of that is extremely important.

And I also serve on the Select Committee for Climate Change, and I take that very seriously because I think the climate is changing. I think that we need to do all the things that we can to make sure that we are mitigating and

adapting to the changes that are taking place. We are having rising sea levels in the coastal area. We recognize that. Now how much of it is manmade, that is a topic for another discussion, but it exists and it is happening. I recognize that.

I wanted to ask you, Mr. Christman, I understand that many of your companies -- and, in fact, some in Georgia -- are looking at some innovative projects. For instance, Delta Airlines and Nexus Fuels are doing some very innovative things to reduce waste. Can you share with us some of that?

Mr. Christman. They are. They are taking used plastics and converting them into jet fuel, so to provide a new opportunity to use that material. Plastics in many cases start as energy, start as natural gas. About 70 percent of the plastics in the United States come from natural gas. And that process can take it back to being a fuel in the case of that.

But I also talked about other technology, and I think this is also a stepping stool to additional technologies that will take plastic back into the plastic raw materials that we can make new plastic out of. A company called Agilyx in Oregon is doing that right now with polystyrene, a material

that is often thought of as not recyclable, but taking that polystyrene back to styrene. And then, they can make brand-new food grade polystyrene out of it again.

Mr. Carter. It is amazing to me some of the things that are being done, the innovation that is being done. Cox Enterprises in Georgia has a facility. Are you familiar with it? It is in Brantley County in Nahunta, where they are taking used tires and, actually, they bought some equipment from over in Europe. They are actually taking it and breaking it back down into oil, into things that they can use like that. It is simply amazing, the innovation.

I have always said the greatest innovators, the greatest scientists are right here in the United States of America. That is why I am excited. I get excited about when we talk about what we are going to be doing in innovation in the future of this country. I think it is going to create a great economy. I think it is going to create a lot of jobs for us.

Now, Mr. Christman, one of the things when you mention this about Delta and what they are doing, it is important that we keep the economy strong because we are going to need the private sector helping us with this. This is not going

to be a totally public initiative. We need the private sector with this kind of innovation like I mentioned with Cox Enterprises, like you mentioned with Delta Airlines. Is it important to us, would you agree, that we keep the economy strong, so that we have the private sector investing in these type of things?

Mr. Christman. Absolutely. I think since China imposed their ban on recyclables, we have seen already $4.2 billion invested in new technologies to recycle and recover plastics, and many of them, these advanced recycling technologies like Nexus.

Mr. Carter. One other thing that I want to mention about Georgia -- obviously, I am very proud of our State, with good reason -- we are the No. 1 forestry state in the nation as well. And we see a lot of recycling in our paper mills and in our paper products. We do a lot of that. We have recovered fiber to make new paper and paperboard products, and that is certainly something important.

There is a lot of confusion about what can and can't be done with recyclables. How important is consumer education, that we continue to make sure consumers understand what we can do and what we can't do? Mr. Johnson, I see you nodding.

Mr. Johnson. Yes, absolutely. Public education and awareness is probably the most important thing we can do right upfront because it tells people what they can and should not put into the bin. If you put contaminants into the system at the beginning, you damage the material right then and there. It is very, very difficult, and often impossible, to clean that material, to get it back into a commodity grade material that can be used again. So, the public education is very important.

The RECYCLE Act, which is now in the House as well, Mr. Joyce has introduced it. That is a very, very good bill for doing that.

Getting EPA to develop education programs, public service announcements, and things like that; labeling, and just explaining to people what they should and shouldn't put in there, and trying to get rid of some of the confusion that people have.

Mr. Carter. Great.

Well, my time is up. But, again, I thank all of you for what you are doing. This is extremely important and we appreciate you being here today. And "Go Dogs".

Thanks.

Mr. Tonko. The gentleman yields back. The chair now recognizes the gentleman from Florida, Representative Soto, for 5 minutes, please.

Mr. Soto. Thank you so much, Mr. Chairman.

And thank you all for being here. This is obviously a really important issue.

Being in a state that is surrounded on three sides by water, we are facing the sea and ocean aspects of what we can recycle and what ends up in Florida's oceans.

I am aware of, and I have been reading for quite some time, China is no longer accepting a lot of our recyclable supplies, which is concerning. So, I did want to talk about both the secondary markets and talk about what we could do for plastic alternatives.

When I read that there is an island of plastic the size of Texas in the Pacific, that was kind of a wake-up call for me, that we have to balance out between recycling and non-plastic alternatives.

I wanted to start with the secondary market, though. If I could first hear from Lynn Hoffman? It would be great to hear, what is the current status of not only domestic recycling of plastic, but the foreign market? Where is it

going? Where are we not able to recycle? What does sort of the domestic and global market look like right now?

Ms. Hoffman. I can only speak from our experience and tell you that, in part because of our mission and in part because of our location in the Midwest, 100 percent of our materials stay in North America. Ninety-five percent stay in the Midwest. We have certainly exported material in the past, but, for the most part, our materials stay domestic.

So, the plastics that we collect and have markets for are the No. 1, PET bottles; No. 2, natural, and No. 2, color, and No. 5, polypropylene.

Mr. Soto. If we are looking at it nationally and internationally, though, where are the emergent markets and where are the markets that are waning right now?

Ms. Hoffman. I think that, again, being in the Midwest, we are lucky to have access to paper recycling, but there is a lot of tension on plastic, and rightly so, because plastic was a major contaminant in paper. But the paper markets are what really suffered in the wake of the National Sword and where we really need investment in terms of domestic end markets.

Mr. Soto. Mr. Zaldivar, I see you moving your hand. If

you want to answer that question, too, please.

Mr. Walden. Thank you, Congressman.

So, like you, we share a coastline. But I suppose not all plastics are created equal. There are some markets for three types of plastics right now: PET, HDPE, and PP. All the other plastics are going into the landfill. So, to the extent that innovation and technology can be brought to bear, that is where the help is needed, because, otherwise, they are either ending up in the waterways, as you pointed out, or in the landfill.

Mr. Soto. And we are going to get to that in one second, but can you, based on your experience in Los Angeles, say where the emerging markets in the world are for secondary recycling and where are the ones that are closing right now?

Mr. Zaldivar. Yes. So, I am making a pitch here for us to develop markets within North America and definitely domestic in the U.S. I think Mexico is a great destination market that we need to explore more and, to a large extent, Canada.

Mr. Soto. My next question is about alternatives. I am seeing corn products be used, even agave recently, which I had an agave straw the other day and I thought that was

interesting. It would be great to hear from Dr. Jambeck, Ms. Patel, and Mr. Christman about alternatives that could be utilized like corn and agave that are biodegradable. And we will start with you, Dr. Jambeck.

Ms. Jambeck. Sure. I will be quick since you want to hear from everybody. But one thing we have at the University of Georgia is a New Materials Institute. And so, polymer chemists and chemical engineers have partnered with me in environmental engineering to look at materials.

Mr. Soto. Like what? What materials?

Ms. Jambeck. So, right now, we are looking at PHA. PHA is made in this case from canola oil, and it can be made from various organic materials, and even a potential waste organic material.

Mr. Soto. Thank you.

Ms. Jambeck. Yes.

Mr. Soto. My time is limited. So, I am going to turn to Ms. Patel. What are some of the alternatives that you see strong in the market coming forward?

Ms. Patel. We think the No. 1 solution is to reduce waste as much as possible, but I recognize your question about biodegradable products. Mr. Christman actually

mentioned that in a lot of cases, when we send things that are biodegradable either to composting facilities or to landfills even, we have to make sure that they actually are biodegradable in those environments.

Mr. Soto. Sure. That is a great pivot to Mr. Christman.

Ms. Patel. Sure.

Mr. Soto. Navigate us through this a little bit.

Mr. Christman. So, one of the great things about plastics is they can be made from a variety of sources of carbon, whether it is new carbon or natural gas. Corn is an example. They make polylactic acid, or PLA, that has been used in some other applications.

The question to go with that is, is it better for the environment ultimately? You really need to do life-cycle assessment to determine whether or not those alternatives reduce greenhouse gas emissions or other environmental impacts; make sure you are not causing new environmental impacts to go with it.

Mr. Soto. Thanks for that.

And I yield back.

Mr. McNerney. [Presiding.] The gentleman yields back.

The chair now recognizes himself, the gentleman from California, for 5 minutes for questions.

Ms. Hoffman, can you elaborate on the new methods that Eureka Recycling is working on to apply artificial intelligence to build transparency and traceability to the supply chain?

Ms. Hoffman. Certainly. We are working on a project using a visioning system that reports -- currently, it gives us real-time information about what is coming across the line. It is technology that has traditionally connected to robots for collecting. We are just using the eyes and the brains, basically.

Recycling has kind of traditionally been a very blunt instrument, measured in tons, but a ton of plastic means something really different than a ton of cardboard. And so, we are really trying to use this information to help us learn how we might use different metrics in measuring success of recycling, looking at individual action, looking at what are the types of materials that we are seeing that are hard to capture, and most often in our residual or end of the line.

Mr. McNerney. So, it might be pretty useful in the sorting process?

Ms. Hoffman. Possibly. I think right now we are looking at it more as data that informs not only our operations, but also the upstream solutions. What are the products that need redesign?

Mr. McNerney. Thank you.

Mr. Zaldivar, you have noted that, in order for your industry to increase in value, new technologies and updates to effective strategies are needed. How do you envision these updates playing out, especially with regards to how they might assist in waste sorting and processing?

Mr. Zaldivar. Thank you, Congressman. You touched on, your earlier question, technology. There is incredible optical technology that can distinguish even between types of plastics just by reading into the density and in some cases into the molecular composition of a material. And those can be expensive. In fact, they are expensive. But that is a great example where an investment in technology can help in the sorting and the quality control of what gets into the return cycle.

Mr. McNerney. So, can you elaborate, Dr. Jambeck, on your five "C" approach to reduce the challenges faced by waste operators and municipalities in managing the waste

system?

Ms. Jambeck. Sure. So the five "C's". I have collect, capture, contain, and I think what is also very important, I said, was context, and culture.

Mr. McNerney. Okay.

Ms. Jambeck. And I left those very general. Those I use even globally. So, for people, really, our waste is very localized and that is how we have been addressing it here in the U.S. And so, taking into account what you have locally, your local context is important, but, in general, we need to get the waste and materials collected. We need to process them and have them in facilities, and then, either dispose of them properly or recycle, hopefully moving towards complete circular materials management.

Mr. McNerney. Thank you.

Ms. Hoffman, again, you have noticed that, when we were discussing new recycling technologies, we must draw a wide circle around the potential impact. Can you speak to the importance of considering all the externalities of the cost of waste and comparing it with new technologies and strategies?

Ms. Hoffman. Yes. There are absolutely limitations to

mechanical recycling, which is how we describe recycling that happens today, where a plastic bottle is ground up, melted down. But I think we are seeing a lot of emerging technology that is promising the moon and the stars in terms of circularity. And I think it is really critical to take a step back and look at what is going into this, what are the inputs into this technology and what are the outputs, not only just whether or not it is successful in making that polymer circular.

Mr. McNerney. One of the things that intrigues me is upstream work, encouraging producers to plan for recycling in the ultimate product, so that it can be recycled easily. So, how effective would that be in terms of helping this problem? Whoever cares to answer that. Mr. Zaldivar?

Mr. Zaldivar. It would be extremely important. I think circularity and recyclability begin when the product is being made. And so, to the extent that the recyclability is ingrained in the product upstream, and the ability to take some of it back, that is where it should begin.

Mr. McNerney. You think it would be best achieved with regulatory or with incentives, a regulatory approach or incentives?

Mr. Zaldivar. I think both.

Mr. McNerney. Both?

Ms. Hoffman, you are shaking your head.

Ms. Hoffman. I would just like to add, yes, but I think something that is often overlooked is that MRFs, or recovery facilities, can't sort by brand. So, if we look to the marketplace to create innovation, we can't educate our customers to put in only a certain kind of toothpaste tube and not the others. And we can't sort that way when we are going through 400 tons a day. So, there does need to be regulation and standardization upstream.

Mr. McNerney. Thank you.

The chairman's time has expired. The chairman now recognizes Mr. Cardenas, the gentleman from California, for 5 minutes for questioning.

Mr. Cardenas. Thank you very much, Mr. Chairman. I appreciate the opportunity to hear from very smart people who are out there in the real world dealing with this, and hopefully, us, as policymakers, still the real world, a different world, that we can actually ascertain what needs to be done. And hopefully, make some positive decisions, whether it is through laws, whether it is through incentives,

whether it is through whatever it is that we can help at the federal level.

First, I would like to thank the committee for having this important hearing. I would also like to thank all of the witnesses and, also, the guests here who are paying attention to this very important issue, for coming together to figure out what we are going to do and how we are going to make this world a better place, and a much more lasting place for habitability.

One of the things that I would like to ask, has it been explored or talked about, or are we there yet, where in the sorting facilities, for example, where items can actually have a code? Because scanning can be done now incredibly rapidly, and it can be done in a way where you don't even have to pull the item forward, like we do at the supermarket. It can actually be scanned much simpler in tremendous mass. Is that happening out there yet for that purpose?

Ms. Hoffman. Not that I am aware of in terms of being implemented in MRFs. I have certainly heard talk about that technology. Maybe Mr. Johnson knows that.

Mr. Johnson. Yes, I am not sure about that, and I can look into it for you. More on the industrial side, yes,

optical sorting is very, very good. It has been really improved over the last 10 years, a lot of it coming from research and development grants that came from the federal government.

Mr. Cardenas. Okay. Thank you. Hopefully, that is going on out there, because I think that could be an incredible solution.

When I was on the city council, I happened to represent the community -- and I still do at this level -- the community in Los Angeles that had and has previously closed landfills and active landfills, the most in the entire county. And that was where I grew up. I used to go to those landfills with my father because he was a gardener and we did our share of having to take things to the old-fashioned dump, which, to me, it is incredible that we still do that because I can see cavemen and women doing that thousands of years ago. We need to move to better technologies.

I was the first person to actually actively turn down a permit to extend a landfill in my community. And everybody got upset and the unions got upset. Everybody said, no, we are going to lose jobs, or what have you. I said, no, we are not because we are still going to have trash. Los Angeles

dumps gazillions of tons of trash every year because consumers do that. We are Americans; that is what we do, unfortunately.

And what we were able to do is stop the landfill from taking in trash, but we actually supported and permitted for them to have a sorting facility, and the first of its kind, modern, et cetera. We required it to have the best technology, et cetera.

So, solutions can be made. My main point to everybody is we have to all calm down and realize that, when we are calm and respectful, then we can get things done.

Everybody was mad at me. First, it was the people who had the jobs at the landfill; they were upset at me. And then, the environmentalists were happy with me. And then, when I told them, well, we are not going to send the company out of the district, we are just going to change the way we deal with the waste, then the environmentalists got mad at me because it wasn't a pure solution. And then, when we finally got everything done, and we took those tons and tons of trash per day, actually, everybody went back to being happy.

But, in the meantime, I literally got told by one side, "We are going to unelect you in your next election." And

then, the other ones said, "No, that is not going to happen. We are not going to let that happen." And then, they said, "We are going to unelect you," right? And then, finally, everybody said, "Well, the election doesn't matter. You finally found a solution."

And my point wasn't about elections. My point was about I was that kid that grew up in a neighborhood that shouldn't have had so many darn landfills. And today, hopefully, my grandchildren won't have to say what I used to say growing up, "What is that big mountain of trash doing in my neighborhood?" And I am very blessed as a grandfather; my grandkids live in my neighborhood.

So, Mr. Zaldivar, with the very little bit of time that I have left, in your opinion, is there more that we can do to support recycling and waste infrastructure in Los Angeles and beyond in this country?

Mr. Zaldivar. Absolutely. There is a lot to be done. You reminded me of the technology advances that some of them you have supported yourself, your bill here currently being considered. Robotics have started to come into the sorting industry. We have a MRF in LA that makes full use of robotics, in addition to all the optical sorting as well.

The upstream solution, I think we cannot overly burden our residents and the average person with wanting and needing to know everything about whether an item is recyclable. We ought to simplify that, so that they don't have to turn on and turn off what they can put in a blue bin. If we continue to do that, they will just turn off our recycling altogether. Technology has got to be important here.

Mr. Cardenas. Yes.

I yield back the balance of my time. Thank you.

Mr. McNerney. The gentleman yields back.

I request unanimous consent to enter the following documents into the record:

A letter from Representative Dean Phillips;

A letter from Energy Recovery Council;

A letter from Flexible Packaging Association;

A letter from BIO, the Biotechnology Innovation Organization;

A letter from the Plant Based Products Council;

A letter from Eastman Chemical;

A letter from Glass Packaging Institute;

A letter from CHZ Technologies;

A docket from ISRI entitled, "Four Pressure Points in

Recycling: ISRI's 2019 Recycling Industry Yearbook";

A letter from the Portland Cement Association,

And an article entitled, "Wind Turbine Blades Can't Be Recycled, so They're Piling Up in Landfills".

Without objection, so ordered.

[The information follows:]

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

Mr. Shimkus. Mr. Chairman?

Mr. McNerney. The gentleman is recognized.

Mr. Shimkus. I ask unanimous consent that a member of the full committee, Dr. Bucshon's statement and questions can be submitted also for the record.

Mr. McNerney. Without objection, so ordered.

[The information follows:]

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

Mr. McNerney. I would like to thank the witnesses for joining us today in the hearing. I think your testimony was very informative and useful.

I remind members that, pursuant to committee rules, they have 10 business days to submit additional questions for the record to be answered by our witnesses. And I ask our witnesses that you respond promptly to any such questions that you may receive.

At this time, the subcommittee is adjourned.

[Whereupon, at 12:26 p.m., the subcommittee was adjourned.]