

**DISCUSSION DRAFT OF H.R. _____,
“INSULAR AREA CLIMATE
CHANGE ACT”**

LEGISLATIVE HEARING

BEFORE THE

COMMITTEE ON NATURAL RESOURCES
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTEENTH CONGRESS

FIRST SESSION

Thursday, March 4, 2021

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**LEGISLATIVE HEARING ON DISCUSSION
DRAFT OF H.R. ____, TO PROVIDE FOR
CLIMATE CHANGE PLANNING, MITIGATION,
ADAPTATION, AND RESILIENCE IN THE
UNITED STATES TERRITORIES AND FREELY
ASSOCIATED STATES, AND FOR OTHER
PURPOSES, “INSULAR AREA CLIMATE
CHANGE ACT”**

**Thursday, March 4, 2021
U.S. House of Representatives
Committee on Natural Resources
Washington, DC**

The Committee met, pursuant to notice, at 12 p.m., via Webex, Hon. Raúl M. Grijalva [Chairman of the Committee] presiding.

Present: Representatives Grijalva, Sablan, Lowenthal, Porter, Leger Fernandez, DeGette, Soto, García, McCollum, Cohen, Tlaib; Westerman, Gohmert, Radewagen, González-Colón, Stauber, Tiffany, Carl, Rosendale, Moore, and Bentz.

The CHAIRMAN. The Committee will come to order.

The Committee is meeting today to receive testimony on legislation authored to address issues related to our planet’s changing climate and the impact it is having on our insular areas.

Under Committee Rule 4(f), any oral opening statements at the hearing are limited to the Chair and the Ranking Minority Member or their designee. This will allow us to hear from our witnesses sooner and help Members keep to their schedules.

Therefore, I ask unanimous consent that all other Members’ opening statements be made part of the hearing record if they are submitted to the Clerk by 5 p.m. today or at the close of this hearing, whichever comes first.

Hearing no objection, so ordered.

Without objection, the Chair may also declare a recess subject to the call of the Chair.

As described in the notice, statements, documents, or motions must be submitted to the electronic repository at HNRCdocs@mail.house.gov.

Additionally, please note that as with in-person meetings, Members are responsible for their own microphones. As with our in-person meetings, Members may be muted by our staff only to avoid inadvertent background noise.

Finally, Members or witnesses experiencing technical problems should inform Committee staff immediately.

Let me now recognize myself for the opening statement, and then I will turn to the Ranking Minority Member for their statement.

STATEMENT OF THE HON. RAÚL M. GRIJALVA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARIZONA

The CHAIRMAN. Last Congress, the Natural Resources Committee embarked on an agenda to highlight and gather facts on the impact of changing climate on our planet. The Committee held the first climate change hearings in nearly a decade and took action to fight the climate crisis. We listened to scientists, elected leaders, Native American communities, youth advocates, and members of the public, and their comments and stories informed the action we took on climate change last year.

One of those actions led to the development of the Insular Area Climate Change Act of 2021, this discussion draft that is before us today.

U.S. territories and Freely Associated States, also known as U.S.-affiliated insular areas, are on the front lines of the climate change crisis. In recent years, some territories have experienced major natural disasters stemming from climate change, including Hurricane Irma, Hurricane Maria in 2017, and Typhoon Yutu in 2018.

Insular areas face sea-level rise, coastal erosion, temperature increases, and droughts like other jurisdictions. Nevertheless, insular areas experience additional vulnerabilities, such as an unequal access to Federal programs, an over-reliance on petroleum, and an existing infrastructure that fails to meet new hazard-mitigation codes.

The U.S.-affiliated small island nations increasingly are being forced to consider what will happen if the rising sea washes over their lands. Specifically, will it mean a loss of their sovereignty and resources and having to decide where their people go from there?

The Insular Area Climate Change Act of 2021 discussion draft seeks to address these threats by creating an interagency task force to identify ways to provide greater access to climate-change-related Federal programs to U.S. territories, establish an Office of Insular Area Energy Policy and Programs within the Department of Energy to centralize and expand Federal energy programs in insular areas, and to create multiple grant programs to invest in renewable energy and sustainable infrastructure in the insular areas.

Climate change is real, and 97 percent of climate scientists agree that climate warming trends over the past century are extremely likely due to human activities. We must all do our work to reverse this trend, which we aim to do through the work of this Committee.

The Insular Area Climate Change Act and the other bills we are seeking to get enacted this year will provide some of the additional tools we will need to begin to address climate change.

Thank you.

With that, let me now turn to the Ranking Member for comments. The Ranking Member is recognized.

STATEMENT OF THE HON. JENNIFFER GONZÁLEZ-COLÓN, RESIDENT COMMISSIONER IN CONGRESS FROM THE TERRITORY OF PUERTO RICO

Miss GONZÁLEZ-COLÓN. Thank you, Mr. Chairman.

I want to thank the witnesses for being virtually with us today. Specifically, I want to particularly welcome the two witnesses from

Puerto Rico, Ms. Ada Monzón and Secretary Machargo from the Natural and Environmental Resources Department. It is great to see you again.

I would also like to commend, in part, the intent behind the draft legislation we have before us today. It is no secret that territories, like other coastal communities across the nation, face unique climate changes, such as coastal erosion, as you said, sea-level rise, and the impact of extreme weather events.

We all recognize the need to tackle these issues, build resilience, and implement mitigation measures. But we also recognize that territories heavily rely on imported petroleum products to meet our energy needs. In Puerto Rico, petroleum-fired power plants generate almost half of Puerto Rico's total electricity, while renewables only account for 2.5 percent of our electricity generation.

Like many, I am sensitive to saving our planet and recognize that we should increase our use of renewable energy sources. However, I also support an all-of-the-above energy approach. I am a strong proponent of liquefied natural gas, which provides cheap, clean, and reliable energy. Reliable, I think, is crucial for Puerto Rico, especially to support and expand our pharmaceutical manufacturing industries.

The draft legislation we are discussing today authorized approximately \$200 million through a series of new grants, programs, and offices within the Department of the Interior, NOAA, the Department of Energy, and EPA. While having resources available to the U.S. insular areas is most welcome, I fear this bill does little to study existing programs and functions that could support some of the goals intended in this legislation.

Additionally, I am concerned about the definition of "Insular Areas" under Section 1469(a) of Title 48 of the U.S. Code, to include Puerto Rico. This section currently only applies to the other four territories and authorizes Federal agencies to waive applicable matching requirements for them. It also authorizes Federal agencies to consolidate grants to a particular territory under multiple programs. The individual territory may then determine the proportion of the consolidated grant to be spent on various activities.

I fear that adding Puerto Rico to the definition of insular areas under Title 48 could have unintended consequences of an overhaul of how Federal grant programs work on the island. Currently, Puerto Rico is often treated as a state for purposes of multiple Federal allocations. I am concerned that authorizing agencies to consolidate grants, at least for Puerto Rico, will not only impact how Federal programs are carried out but also the amount of funding we are eligible for.

Additionally, I will note that the bill includes a portion of the Offshore Wind for Territories Act, bipartisan legislation I have introduced, to study and, if feasible, authorize offshore wind energy development in Federal waters adjacent to the territories, which is a bipartisan bill. It does not include, however, the bill's revenue-sharing and coral reef conservation provisions that our bill includes. It is my hope that we can move forward that bill in its entirety as a stand-alone this Congress.

Finally, I am deeply concerned that we will not be hearing today from witnesses from the Administration who will be charged with

implementing this bill if it is signed into law, like the Department of the Interior, EPA, NOAA, among others, including the Department of Energy.

I would respectfully ask, Mr. Chairman, that we formally ask the Administration or the people who are running those agencies at this time for their comments and provide members of the Committee a chance to ask them questions. And it remains unclear whether any of these programs or office functions will be duplicative or redundant.

Having said that, I thank you, Mr. Chairman, and I yield back.

The CHAIRMAN. Let me thank the gentlelady. I appreciate the Commissioner's comments. I thought they are well-taken.

I think your point about, does consolidation mean less, does consolidation mean that we are staying at the same cap of money and yet with a larger demand and a larger responsibility and requirement, I think that is a very valid point that, as the legislation moves forward, certainly needs to be looked at.

And as for the Administration, I concur with your point. And as this legislation is finalized, having input from today's hearing, and additional discussions with Members continue in a bipartisan way, that we have a piece of legislation that the Administration needs to comment on, because that is the legislation that is projected to move forward. Certainly their comments, their opinions, and their recommendations to the Committee will not only be forwarded, and hopefully we will have an opportunity to have those discussions in person. And I appreciate those comments.

With that, let me now turn to our witnesses.

Let me begin now—first, let me confer with the Ranking Member.

Mr. Westerman, you wanted to comment on something? Let me recognize you. Sorry, I didn't see your signal, but I do now.

Mr. Westerman, you are recognized.

If not, let me return to the witnesses.

Ms. Ada Monzón, Member, Puerto Rico Climate Change Committee.

Ms. Monzón, 5 minutes are yours. The full complement of your comments will be made part of the record regardless. The floor is yours and the time is yours, Ms. Monzón. You are welcome.

**STATEMENT OF ADA MONZÓN, PRESIDENT,
ECOEXPLORATORIO, PUERTO RICO SCIENCE MUSEUM,
GUAYNABO, PUERTO RICO**

Ms. MONZÓN. Thank you. Good afternoon. I would like to thank you, Chairman Grijalva, Ranking Member Westerman, and our Resident Commissioner, Jenniffer González-Colón, for the invitation to testify before this Committee.

It is an honor to share with you today my experience regarding the impact of climate change in the island environment and the need for swift actions to avoid the negative consequences of climate change.

I am meteorologist Ada Monzón, and I have been a forecaster in Puerto Rico for 32 years. During that time, I have forecasted Hurricanes Hugo and Georges. Most recently and for the first time in my life, I faced the challenge of keeping Puerto Rico informed during

the passage of the island of two Category 5 hurricanes, Irma and Maria.

I am also an educator and a broadcaster. As an educator, I have dedicated my life to teaching about natural hazards and connecting science with the communities, especially working with non-profits; schools; industries; emergency management; local, state, and federal government.

I am here representing Puerto Rico, the education community, nonprofits, through the EcoExploratorio, which hosts the Science Museum of Puerto Rico and the Resilience Institute of Puerto Rico.

This conversation is needed because our islands are already victims of climate change and are in a very vulnerable position compared to other countries in the world. Changes due to climate change are already evident along our coasts due to sea-level rise and coastal erosion, in the temperature and rainfall records, in the impact to our corals and marine ecosystems, in our health system and economic development, and in our response and recovery to catastrophic events.

First, we need to understand the science and impact of climate change in our daily lives. Scientists around the world have demonstrated that our global temperatures are rising in an unprecedented manner. Under these conditions, there will be direct and indirect effects on organisms; hydrological cycles; maximum temperature records; decrease in agricultural productivity; changes in habitats and wildlife distributions; risks to human health, such as stroke and cardiovascular diseases; and the quality of life on Earth will significantly decrease. Life as we know today will not end but will be significantly different.

We can talk about science related to climate change, and there is enough data on this, but what we need to do is the right thing in how the Committee can help change and influence the future of our islands and country, addressing energy, coastal erosion, the weather warnings, and the community needs.

As important as it is to move to renewable energy to reduce greenhouse gas emissions, our islands need to concentrate on the implementation of adaptation and mitigation measures to reduce health, social, and economic vulnerabilities.

Current fiscal and economic challenges of the island, coupled with an increasingly elderly population, create additional challenges for the island's government to prepare for, respond to, and recover from climate-related disaster.

I strongly believe that to transform our communities we need to understand their needs, and only then can we design and implement programs in ways that community members engage to achieve adaptation, resilience, and mitigation.

Climate and extreme weather events suffered in the last 5 years in Puerto Rico have catalyzed actions that help us advance social transformation in our community, promoting an uprising in community-based organizations that have pursued sustainable development and climate adaptation. These initiatives were centered on the engagement of the communities that were impacted by Hurricane Maria and are still recovering from the aftermath.

The question we need to ask ourselves is how to best approach it. I would urge this Committee to make sure that public policy

serves our communities and that we use all the scientific knowledge to make it useful to the communities. If we have better local emergency management resources, we can respond faster.

If we have accessible and prepared healthcare facilities for long-period energy outages, we can respond to people that need intensive care, oxygen, insulin, or suffer renal deficiency and cancer.

If we have better data collection of the most vulnerable population, we can respond faster. If we have incentives for renewable energy practices, we will have less economic impact. If we have better agricultural practices, we will have more food security.

If we want to ensure the integrity of ecosystems and the protection of biodiversity, some can probably resist external environmental stresses. If we have more empathy and solidarity, we can better understand community needs and make decisions that are community-based, centered on the well-being of the community.

Climate change is real. By experience, we know.

Thank you for holding this much-needed and important hearing.

[The prepared statement of Ms. Monzón follows:]

PREPARED STATEMENT OF METEOROLOGIST ADA MONZÓN

Good afternoon. I would like to thank Chairman Grijalva and Ranking Member Westerman for the invitation to testify before this Committee on the “Insular Area Climate Change Act.” It is an honor to share with you today my experience regarding the impact of climate change in the island environment and the need for swift actions to avoid the negative consequences of climate change.

I am meteorologist Ada Monzón and I have been a forecaster in Puerto Rico for 32 years. During that time I have forecasted and given weather updates during Hurricanes Hugo and Georges, and more than ten other tropical storm and hurricanes. Most recently—and for the first time in my life—I faced the challenge of keeping Puerto Rico informed during the passage through the Island of two Category 5 hurricanes, Irma and Maria. I am also an educator and a broadcaster. As an educator, I have dedicated my life to teaching about natural hazards and connecting science with the communities, especially working with nonprofit organizations, schools, industries, emergency management, local, state, and the federal government. I am here representing Puerto Rico, the education community, and nonprofits through the EcoExploratorio, which hosts the Science Museum of Puerto Rico and the Resilience Institute of Puerto Rico.

This conversation is needed because our islands are already victims of climate change and are in a very vulnerable position compared to other countries in the world. Changes due to climate change are already evident along our coasts due to sea-level rise and coastal erosion, in the temperature and rainfall records, in the impact to our corals and marine ecosystems, in our health system and economic development, and in our response and recovery to catastrophic events.

First, we need to understand the science and impact of climate change on our daily lives.

Temperatures

Scientists around the world have demonstrated that our global temperatures (air and sea surface) are rising in an unprecedented manner. The average temperature of the Earth was 57°F between 1951–1980. Last year (2020) was 58.76°F (1.76°F above average). Models project that if there are no actions to stop the greenhouse gases, there will be an alarming rate of increase of temperatures:

- by 2030 more than 2°F,
- by 2050 up to 4°F,
- and by 2100 up to 9°F.

Under these conditions, there will be direct and indirect effects on organisms, hydrological cycle, maximum temperature records, decrease in agricultural productivity, changes in habitats and wildlife distributions, risks to human health such as stroke and cardiovascular diseases, which are the primary causes of death most associated with elevated summer temperatures, especially in vulnerable

populations, and the quality of life on Earth will significantly decrease. Life, as we know it today, will not end but will be significantly different.

What is the cause of the changes in temperature? There is plenty of evidence saying that this increased warming is related to human beings' daily activities around the world, such as producing energy based on fossil fuels, as coal and natural gas. The gases that are released into the atmosphere that are causing this global warming are carbon dioxide and methane. These are greenhouse gases that trap heat, which in turn warm the surface of the Earth and our oceans. Due to the influence of global warming from decades of greenhouse gas emissions, we now have a climate emergency. Immediate actions are needed to control these emissions while accelerating our adaptation measures and increasing our resilience to deal with this complex crisis.

Sea level

Since the middle of the 20th century, relative sea levels have risen by about 0.08 inches per year on average along the coasts of Puerto Rico and the USVI. However, rates have been slowly accelerating since the early 2000s, according to the 4th National Assessment for the Caribbean Region.

Under extreme scenarios, relative sea levels are projected to rise (compared to levels in 2000) by:

- 2050: up to 2.8 feet respectively,
- 2100: up to 10.2 feet respectively,

According to an IPCC report, the world projected sea level rise by 2100 could be up to 35 feet with a midpoint around 19'. It depends on how much of the Greenland and Antarctic ice sheets melt and how much ocean water expands. This could lead to an array of serious problems, especially for our islands, some of which can become uninhabitable. This can displace millions of people and cause catastrophic economic damage. In Puerto Rico, this means that most of our maritime and our most important airport infrastructure will be underwater in less than 100 years if projections are correct. Saltwater intrusion associated with sea-level rise will also reduce the quantity and quality of freshwater in coastal aquifers.

What will this mean to our ocean species? The ecological and biological response is not well understood, but certainly, ecosystems face severe climate impacts due to sea-level rise, changing temperature and rainfall patterns, and are being degraded by pollution, overfishing, and unsustainable development.

Rainfall and freshwater

The impact of climate change on precipitation patterns can be particularly important to island communities. Too much rain along the mountains of our islands causes disastrous floods and landslides, while too little rain can deplete freshwater availability, make an area unproductive related to agriculture, and exacerbate water management problems, planning, and infrastructure capacity. These conditions will result in water rationing and agricultural losses.

Drought projections for Puerto Rico suggest that under increased temperatures, there will be an increase in both drought intensity and frequency due to decreases in precipitation.

Hurricanes

According to NOAA, hurricanes are becoming stronger, and climate change is making these storms more intense and destructive. Warming has increased the likelihood of a hurricane developing into a Category 3 or higher by about 8 percent a decade, and the trend line for this type of hurricane is up. As warming continues, the likelihood of having more intense storms and moving slower can have an enormous impact on life and property. Now we are preparing for the next hurricane season in three months.

Impact to Health

Health impacts include extreme heat that can cause dehydration, lack of clean water and sanitation, an increase of air contamination, more frequent and stronger Saharan dust events, and vector-borne diseases. Mental health impacts are also notable, as most survivors experience a high degree of psychological trauma during and after hurricane events.

Community Approach

Catastrophic events reveal that islands have more difficulties in responding to hurricane impacts and dealing with extreme impacts. It takes longer for disaster logistics and operations to establish, for managing supplies, and the time to task the response and recovery is enormous. There is a disproportional effect in our

geographically small islands because we are remote and relatively short on human, food, water, and resources.

As important it is to move to renewable energy to reduce greenhouse gas emissions, our islands need to concentrate on the implementation of adaptation and mitigation measures to reduce natural, health, social, and economic vulnerabilities. Current fiscal and economic challenges of the islands, coupled with an increasing elderly population, create additional challenges for the islands' governments to prepare for, respond to, and recover from climate-related disasters.

I strongly believe that to transform our communities, we need to understand their needs, and only then can we design and implement programs in ways that community members engage to achieve adaptation, resilience, and mitigation. Therefore, governments, universities, and nonprofits need to change their approach by providing community-based solutions that can address the impact of climate change. Conversations are needed. Listen to their needs, then provide capacity building, connect leaders with other sources of information, use mapping tools, and look for strategies that are not government-centric for catastrophic events. For the immediate response to an extreme event, the local emergency management, nonprofits, and volunteer organizations are the first responders. Usually, these have extremely limited resources and struggle to deliver services. The model or assumption that local, state, and federal government will respond immediately is not real, and those expectations will not be met in the short term.

Climate and extreme weather events suffered in the last five years in PR have catalyzed actions that helped us to advance social transformation in our community, promoting an uprising in community-based organizations that have pursued sustainable development and climate adaptation. There are hundreds of Initiatives (academia, NGOs, and communities) that were borne after the hurricane season of 2017. Hurricane Maria was a game-changer, and we have learned that empowering communities can build a sustainable and equitable future for our islands. These initiatives were centered on the engagement of residents in neighborhoods that were impacted by Hurricane Maria and are still recovering from the aftermath.

The question we need to ask ourselves is how to best approach it? I would urge this committee to make sure that public policy serves our communities and that we use all this scientific knowledge to make it useful to the communities. If we have better local emergency management resources, we can respond faster. If we have accessible and prepared healthcare facilities for long period energy outages, we can respond to people that need intensive care, oxygen, insulin, or suffer renal deficiency and cancer. If we have better data collection of our most vulnerable population, those that are medically fragile, live in poor communities, and handicapped, we can respond faster. If we have an incentive for renewable energy practices, we will have a less economic impact and reduce carbon emissions. If we have better agricultural practices, we will have more food security. If we want to ensure the integrity of ecosystems and the protection of biodiversity, some can probably resist external environmental stresses. If we build according to codes and mitigate in high-risk zones, damages will be reduced. If we maintain our water reservoirs and limit the leakage from pipes, we can conserve water. If we recycle, reduce and reuse, we can protect the environment. If we have more empathy and solidarity, we can better understand community needs and make decisions that are community-based, centered on the well-being of the community.

We all have a responsibility to take actions to save lives, to ensure that we focus on public policy that ensures adaptation, mitigation, and resilience to climate change, and we have a responsibility to educate with empathy and solidarity, to understand the need of our communities, to empower them with resources and funding, to motivate to act and to ensure a better quality of life for our future generations.

Climate change is real. By experience, we know.

Thank you for holding this much needed and important hearing.

QUESTIONS SUBMITTED FOR THE RECORD TO MS. ADA MONZÓN, PRESIDENT,
ECOEXPLORATORIO—PUERTO RICO SCIENCE MUSEUM

Questions Submitted by Representative DeGette

Background

Rep. DeGette's Clean Energy Innovation and Deployment Act includes a provision (Section 130 of H.R. 7516 in the 116th Congress) that may be of great benefit to people living in U.S. territories, as well as on islands and in remote areas worldwide.

The provision would require the Department of Energy (DOE) to establish a certification program for electricity-related technologies for use in remote communities. Companies whose products were certified could use that fact in marketing the technologies, much as do the recipients of DOE's Energy Star label. Facilitating the deployment of these technologies would make modern electricity services more affordable, reliable, and resilient to households in remote areas, and reduce demand for expensive imported fossil fuel-generated electricity and the associated carbon emissions.

Qualifying technologies would include those that can generate electricity off-grid (such as solar panels), those that store energy, and highly efficient appliances, including lights, cell-phone chargers, computers, fans, refrigerators, stoves and ovens. DOE would only certify a technology determined to function properly; generate no greenhouse gas emissions; be affordable, reliable, durable, safe, and protective of human health and the environment; be compatible with other technologies relevant to its functioning, including those which have been similarly certified; and be available for deployment at commercial-scale throughout the territories and states of the United States.

There is already a market for these kinds of technologies, especially in developing countries, but many of the products being marketed today do not work well, are sold on the basis of fraudulent claims, or are not compatible with adjacent technologies (for example, a solar panel not being compatible with a battery). Rep. DeGette's measure would make DOE the validator of these technologies, thus driving their innovation, increasing their quality, protecting consumers in the United States and globally, and facilitating the deployment of affordable reliable resilient climate-friendly technologies to communities in the United States, and around the world, that need them the most.

Question 1. In addition to being on the front lines of climate change, are communities on your islands paying much higher electricity rates due to the fact that most electricity is generated from imported, expensive, and, in many cases, polluting fossil fuels?

Question 2. Are the electric grids on your islands vulnerable to disruption by the effects of climate change, in particular increasing storm intensity, water cycle disruption, average temperatures, and sea level rise?

Question 3. Do you believe this puts an additional and unnecessary financial strain on those living on your islands?

Question 4. Given that, do you think there might be a market on your islands for affordable reliable resilient equipment to generate and use zero-emitting electricity, reducing dependence on expensive fossil fuels and the vulnerable electric grid?

Question 5. Do you think certification of this kind of equipment by the U.S. Department of Energy, as described in the Background section, would increase consumer confidence in it and thereby promote its use on your islands?

Answer. In compliance with the Committee's request for information, and after consideration of the nature of the questions presented by Congresswoman DeGette as part of the hearing on Discussion Draft H.R. , "Insular Area Climate Change Act", I consider it prudent to defer the questions to individuals or entities with competence over energy production or regulation.

I remain in a truthful disposition to continue working in tandem with this honorable Committee to advance climate-conscious discussions and policy making.

Should you require any further assistance or have any questions, please do not hesitate to contact me directly.

Questions Submitted by Representative Graves

Question 1. I am concerned that the creation of new Federal programs may result in duplication with existing programs, diluting funding availability and potential impacts. Are existing programs failing to meet these needs? If so, could they be reformed to better support current inadequacies? Please provide specific examples.

Answer. There should be subject matter experts on this question that can provide more insight into federal energy programs. I understand that, for example, the State Energy Program from the DOE provides funding for technical assistance to states, territories, and the District of Columbia to enhance energy security, advance state-led energy initiatives, and maximize the benefits of decreasing energy waste. The current act project includes a program to provide annual funding for developing and

construction energy projects, which is currently not covered under any existing program.

Question 2. Insular areas are unique in many ways, including energy. These areas are largely dependent on imports for energy—resulting in high costs, reduced energy security and vulnerability to supply chain disruption. Distributed generation and renewables are a very good fit for the natural resource availability of many of these areas. However, my concern is that the Federal Government would be mandating a singular approach. Even if you were to dramatically increase renewables, does it make sense to keep the door open for other energy options?

Answer. The energy vision of Puerto Rico is defined by the government leaders of Puerto Rico. Currently, our Island relies primarily on imported fossil fuels to meet its energy needs. Our electricity is supplied by the Puerto Rico Electric Power Authority (PREPA), which is a government agency that owns the electricity transmission and distribution system. The government's vision is a clear path to progressively increase the share of renewable energy and energy efficiency—while being mindful of debt and the properly regulated procurement processes. Under the Puerto Rico Energy Public Policy Act, PREPA must obtain 40% of its electricity from renewable resources by 2025, 60% by 2040, and 100% by 2050. That is now defined under Act 33–2019, the Puerto Rico Climate Change Mitigation, Adaptation, and Resiliency Act, where Puerto Rico must establish climate change public policy and processes to mitigate, adapt and increase resiliency by sector. I understand that increasing renewables and making them accessible to the general population, especially those people that are in the least accessible and marginalized areas, that are older, and/or that their health conditions require continuous energy supply, should be considered.

Question 3. A primary reason for a government mandates is that a desired outcome does not make financial sense over the long term. Is that the case—would renewable energy be more expensive over the long term? If not, what is the benefit of having the Federal Government impose such mandates (if it potentially ties the hands of these areas should a better option come along in the future)?

Answer. Renewable energy is clearly far cheaper, and studies (PREPA's analysis done by Siemens) or Cambio, IEEFA, UPR Professors like Marcel Castro and Efrain Carrillo have all found that renewable energy is cheaper. Investing now in renewables is a better option, and it does not tie our hands if a better option comes along. Continuing to spend on more costly fossil fuels has an immediate and significant cost and increases our vulnerability and deaths in catastrophic events.

Questions Submitted by Resident Commissioner González-Colón

Question 1. What should be the priority when addressing climate change issues in Puerto Rico and other coastal communities in the United States?

Answer. There are three main impacts of climate change: Environment, Health, and Economic Development, which shows that climate change is not an isolated event, but a complex scenario that is continuously evolving, and extreme atmospheric and ocean events can be compounded with cascade effects. Therefore, climate change has these three main impacts, which are related and multidimensional as a direct or indirect impact.

Priorities to address climate change need to co-exist, and the different stakeholders need to attend to specific areas. Certainly, our vision to address climate change issues in Puerto Rico needs to focus on the short and long term because climate change is already happening. We need to think about how life and the well-being of our islands have been impacted and re-shaped in the past 5 years, and how will it change for the next 50 and 100 years?

Therefore, climate change presents a complicated scenario regarding priorities because it requires addressing multiple topics. However, energy is at the heart of climate action since we need to stop the source of greenhouse gases and the main cause of health-related deaths in extreme weather events that may disrupt the energy supply. We must build systems that are more resilient, robust, and safe. It must consider environmental stewardship for our natural resources: water, air, and land, and the social and economic factors that influence whether a community and its residents can thrive as we face climate change. We must focus on marginalized communities, and this needs risk assessment for mitigation and rapid recovery to natural hazards. We must determine various sources of funding that can support the evaluation and implementation of actions to become more resilient to climate change.

Our immediate threat to Category 4 and 5 hurricanes requires that we be able to respond and recover in a quick manner, as a territory, and at a community/individual level. NOAA has suggested that an increase in Category 4 and 5 hurricanes are likely, with hurricane wind speeds increasing by up to 10 percent, and if global warming continues, our vulnerability to hurricanes Category 4 and 5 will increase.

Our climate change response can be a model for other climate-threatened communities in the United States and the world. Let us consider these priorities and general solutions. I encourage you to meet with specialized stakeholders in each of the following sectors and meet with the Committee on Experts and Advisors on Climate Change, which can provide insight and better define problems and action items. These are just general comments on some of the climate change priorities:

1. Energy

a. Problem: It is not only important to decrease greenhouse emissions (the core of global warming) but because people's health and well-being depend on a stable and reliable source of energy. This sector is the most vulnerable in sudden catastrophic situations and the cause of major indirect deaths.

b. Actions: We need to incentivize renewables and use the funding for reconstruction. We need to protect energy generation, electric grids and manage demand in emergencies and protect current fuel transport and storage while in the transition to renewables. As a first step, priorities should be given to increase renewable energy to the least accessible and marginalized communities, to those that are older and/or that their health conditions require continuous energy supply. Incentives for establishing renewable energy in most households should be a priority. Request PREPA to use the fund for renewable energy systems to critical health, emergency management, and government facilities island-wide. Promote the use of electric cars. Develop the renewable charging infrastructure in Puerto Rico so that there is more available to recharge vehicles.

2. Water

a. Problem: In the Caribbean, drought periods are becoming more frequent and prolonged. Studies of yearly and seasonal precipitation reveal trends over many regions in Puerto Rico. Variations in total precipitation can be caused by a change in the frequency of precipitation. Rainfall is estimated to continue to decrease in a warmer world. There is a significant loss of water across the Island, approximately 60% of the water it distributes to customers due to pipe leakages and illegal hook-ups, according to Puerto Rico Aqueduct and Sewer Authority (PRASA). Our aquifers and reservoirs are diminishing in their capacity, and this restricts agriculture, economic development, and water supply to the general population. Good water quality is essential for maintaining public health and other social services. Also, limited water capacity can limit the ability to respond to increased wildfires. Sea level rise affects the availability and quality of water supply due to saltwater intrusion into groundwater aquifers and distribution networks. Also, decreased water availability can have environmental impacts. Increased heat and drought, as well as catastrophic hurricanes, will promote the migration of people. At the same time, extreme rainfall events can trigger floods and landslides, putting the already vulnerable communities of Puerto Rico in the flood plain and in the mountain region more prone to damages. During Hurricane Maria, there were more than 70,000 landslides.

b. Action: Water issues in Puerto Rico should be addressed, emphasizing three main components: water quality, water availability, and water accessibility. If rainfall continues to decrease, we will need to consider designing a more Resilient Water Management System improving redundancy and diversifying water supplies. For instance, there are many potential solutions for Puerto Rico. First, adopting *Integrated Water Resources Management (IWRM)* principles, a process that promotes coordination on water management, land, and related resources in order to maximize socio-economic welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment. Two, by promoting decentralized water systems such as "Rain Harvesting Systems." Puerto Rico has a high dependence on Central Distribution Water System PRASA against all Resilient Principles. Water collection and production are focused solely and exclusively on rain falling on the headwaters areas of the basins of Puerto Rico. Little attention is given to the amount of water falling on other places of the Island. We must make "smart water actions" by reusing the already occupied urban areas by installing Water Systems to promote water-sensitive cities. We must expand water catchment not by building new reservoirs and dredging existing reservoirs (business as usual)

but by re-utilizing the urban areas (building's rooftops, shopping centers rooftops, schools rooftops, and residences rooftops) to design Rain Harvesting Systems. All these urban areas are large impervious surface areas, only generating runoff and, in most cases of heavy rainfall, causing floods and economic impacts. We must incentivize Rain Harvesting Systems that fills up with alternative methods that help to minimize dependency on PRASA. Desalination should be considered to supply potable water in some coastal communities. However, these systems are costly and expensive to maintain. Water Recycling System is another alternative that needs to be considered in order to reuse water that is flowing already in the "system." Water reservoirs need to be adequately maintained through watershed management plans. Modify and improve drainage systems capacity and work with PRASA for transforming the water sector. Water managers need to maintain a dependable water supply, including alternative supply sources. Increase and incentivize rainwater capture and the recycling of water, as well as educate about "Water Sense" labeled products.

3. Coastal Erosion/Sea Level Rise/Biodiversity

a. Problem: Our coastal areas face complex actions from climate change, but we can effectively respond and build resilience. The vast majority of energy infrastructure is vulnerable due to its location in our coastal areas. Sea level rise and extreme swell events. . . coastal erosion is causing a retreat of the coastline of up to 1 meter per year. Protecting and restoring ecosystems can help us reduce the extent of climate change and cope with its impact. Many coastal communities are facing the reality of looking for shelter for every meteorological phenomenon causing storm surge.

b. Action: To reduce risks and improve resiliency to protect the coastline, identify adaptation options and environmental management experts to include best practices that will include natural engineering practices. Coastal Communities can seek shelter from rising waters and battering storm surges or opting for Managed Coastal Retreat away from the problem. An ecosystem-based approach to the planning of green spaces and nature-based solutions may reduce climate change effects on vulnerable communities. Healthy ecosystems can buffer against coastal erosion or extreme weather events. Local plans for coastal communities should include the context of natural hazards and climate change impact and define mitigation actions that are needed for funding. Immediately discourage construction practices along with the coastal areas, especially in those with severe erosion. There is an immediate need to protect and preserve ecosystems, habitats, coastal development, and controlling invasive species. Evaluate the integration of hybrid and nature-based such as coral reefs, wetlands, dunes, swales, horizontal levees, etc. Legislation should be focused on not permitting development on land vulnerable to hazards and further evaluation and enforcement of land use plans, zoning regulations, and building codes. There should be major efforts for reforestation which is an important intervention for cooling temperatures, landslide mitigation, and climate change mitigation because of its carbon storage potential. There should be strict protection for areas of very high biodiversity and climate value.

4. Food Security

a. Problem: Climate change affects the entire food system (food production and availability, access, quality, utilization, and stability). Isolation and dependence on imports have increased our vulnerability in catastrophic events. This situation has become serious with every natural hazard threat, and it has worsened living conditions. According to IPCC, observed climate change is already affecting food security through increasing temperatures, changing precipitation patterns, and greater frequency of some extreme events, and it will be increasingly affected by projected future climate change.

b. Action: This issue demands large actions because local water scarcity and instability of food production around the world have a direct impact on our food supply. Vertical farms and innovation in food production need to be evaluated because of the high risks, and this may become one of the most significant threats to Puerto Rico from climate change.

5. Health

a. Problem: Climate change affects human health by altering exposures to heatwaves, floods, droughts, smoke exposure, and other extreme events; vector-, food- and waterborne infectious diseases; changes in the quality and safety of air, food, and water; and stresses to mental health and well-being. These changes led to increased risk of exposure to airborne allergens and vector-borne diseases such

as West Nile virus, malaria, dengue fever, and chikungunya to human populations, particularly in tropical communities. Changing patterns and frequency of prolonged heat episodes, ground-level atmospheric ozone concentration or smog, and dust and other aerosols that trigger asthmatic responses are also conditions of concern. Extreme Heat and Air Pollution are silent killers. According to CDC, the health effects can include increased respiratory and cardiovascular diseases, injuries, and premature deaths related to extreme weather events. Deaths can also increase due to natural hazards. The extent to which climate change could alter the burden of disease in any location at any point in time will depend not just on the magnitude of local climate change but also on individual and population vulnerability, exposure to changing weather patterns, and capacity to manage risks, which may also be affected by climate change. According to the American Academy of Pediatrics, the health of children is especially vulnerable to the impacts of climate change because of their growing bodies, their unique behaviors and interactions with the world around them, and their dependency on caregivers.

b. Action: Promote Early Warning Systems to climate hazards affecting Public Health. For instance, dengue is among the most common diseases of humans, with more than one-third of the world's population at risk. For more effective prevention and control in Puerto Rico, we need better prediction and more effective detection systems for vector-borne diseases. Improving Air Quality by reducing air pollution and greenhouse gas emissions. Extreme heat events in urban and rural areas would have a negative effect on human health and other social and economic measures, as well as affect the integrity of ecosystems and the benefits we derive from them. Our community centers and citizens need appropriate healthcare units and treatment centers with state-of-the-art resources to deal with the physical and mental care of the most vulnerable population. Reducing the urban heat island effect while simultaneously promoting an active, healthy lifestyle and increasing mental health programs are measures that need to be taken. Working with pediatricians can help determine the best actions for children.

6. Infrastructure

a. Problem: Increased sea level rise and catastrophic hurricanes can lead to extreme damages and vulnerability to ports, airports, bridges, roads, and energy infrastructure. There will be higher maintenance and repair costs for water treatment systems due to lower quality inputs. The 2019 Report Card for Puerto Rico's Infrastructure released by the Puerto Rico Section of the American Society of Civil Engineers (ASCE) gave eight categories of infrastructure an overall grade of a 'D-'. PR needs to increase its investment in infrastructure and needs to include climate change impact. Infrastructure deficiencies imply a lack of sustainability and a higher vulnerability to climate change.

b. Action: New infrastructure development should be in safe areas and using new materials for longer design life and applying in new ways to be sustainable. Urban transport projects need to move to renewable energy. There should be incentives for "green building" by targeting water-saving and energy-efficient initiatives such as smart meters and LED lighting.

7. Housing

a. Problem: Natural disasters have moved many families to become homeless due to partial or total damages to their residences. Risks associated with wind, flooding, and landslides to residential homes are increasing due to climate change. Most housing in Puerto Rico lacks renewable energy systems.

b. Action: Having a safe and sustainable home is one of our most important assets. We need to discourage construction in highly vulnerable areas and channel housing to safer areas with fewer risks. Structural modification of homes can significantly reduce the roof from extreme events. Working with foundations and non-profits to make housing available to individuals experiencing homelessness faster and at less cost. This provides extra resilience against the effects of natural hazards. In addition to enforcing building codes and land use, homes need to reduce their carbon footprint, and renewable energy should be encouraged and facilitated. New housing and construction should include the most recent building codes, renewable energy, water sense, and energy-efficient products and equipment. Provide incentives for planting and incorporate green practices in housing and other construction.

8. Landfills

a. Problem: According to FEMA/EPA, Puerto Rico could run out of landfill space in 2 to 4 years. There is a capacity problem, which was heightened by debris left by hurricanes and earthquakes, and issues related to mismanagement and compliance. Solid waste management experts expect that by 2022, 67% of the 29 landfills in Puerto Rico will close.

b. Action: Reducing food waste, recycling, and reusing offers big opportunities. There should be policies to encourage backyard composting, which also reduces methane emissions. Emphasis needs to be placed on reducing waste at the source, reusing materials, and then recycling. Environmental Protection Agency (EPA) identifies using recycled materials as a top way to reduce industrial energy use.

9. Information, Outreach, and Education

a. Problem: There is a perception that climate change is not occurring or is not real, or that is not imminent. Also, it is not clear how to adapt to climate change or how to protect our environment. The interdependence of all the factors that can be affected by climate change is not well communicated.

b. Action: Individuals and groups need to understand the importance of addressing the approaching risks to mitigate adverse impacts on society. As important it is to understand the science of climate change, more important is to think about actions and solutions to problems. There will be communities that will require specific needs in adapting to changes in the climate, and we need to take account of the needs of the most vulnerable citizens and do climate justice. Raise public awareness to encourage the local population to adapt and be prepared for the likely impacts of climate change and foster community participation in the decision-making process. Shape the future generation with skills to understand and reflect on the physical and social world so that they can think critically, participate in decision-making and take action.

Question 2. In your written testimony you discuss the need to engage with communities and stakeholders like nonprofit organizations to achieve adaptation, resilience, and mitigation. You also mention that the model or assumption that local, state, and Federal Government agencies will respond immediately is not real.

2a. Can you elaborate on this? Why should we include stakeholders beyond the government in order to effectively respond to and prepare for extreme weather events and other climate-related issues?

Answer. Yes, I was specifically referring to catastrophic events, which are the most challenging to respond to. In catastrophic hurricanes, where all state functions are affected and interrupted, especially when there are simultaneous and/or concurrent threats or disasters across the USA and Caribbean, the ability to immediately respond to the individual necessities are extremely difficult and overwhelming, and planning for these circumstances is almost impossible because of cascading effects. It makes unreal under these circumstances to respond at the local level for the entire Island in 48 hours or less. FEMA mentioned in its "2017 Hurricane Season After Action Report," which included Hurricanes Maria, Harvey, and Irma, that "no jurisdiction or federal agency has all the staff and resources it will need to respond to a catastrophic incident." It becomes a titanic task for the state and municipality to initially assess damages, to respond to multiple needs, which may include people trapped, unable to access areas because of landslides, floods, or wind damage, etc. Lack of communications can make it extremely difficult to make needs assessment, and lack of energy can cause indirect deaths since it becomes impossible to maintain critical facilities and equipment or lifelines that sustain life. The coordination efforts between federal, state, and municipal entities become complex and extremely difficult, and decisions to save life and property can become impaired, among others, for the municipal emergency management offices to respond requires having more personnel equipment or resources that are feasible to respond and save lives in a catastrophic situation.

Stakeholders such as community leaders, non-profit organizations, and private enterprises are considered first responders in the event of an extreme weather event. We must enhance communication channels with the federal, state, and municipal government to develop models of resilience that can mitigate the impact of catastrophic hurricanes in our communities and allow for the short-term response to be more manageable, to strengthen capabilities and help survivors, while the government organizes and respond to critical sectors.

Communities had to rely heavily on neighbors and civil society organizations to deliver effective disaster response and recovery. Building social capital is important

and can provide disaster resilience if used purposefully for such situations. It can be fostered, used, and strengthened through capacity building and the community's strengths, weaknesses, and collaborative capacities to develop a plan of action. Connecting social capital with financial sources and incentives is important so that economic constraints are not the main obstacle for adaptation options to be implemented.

While many positive steps have been taken to address issues in FEMA's 2017 Hurricane Season After Action Report, the earthquakes, COVID-19 pandemic, and the ongoing recovery efforts to Hurricane Maria and continued climate change effects have increased our vulnerability and perhaps lessened our capacities in some areas to respond for the 2021 hurricane season. This needs immediate action.

2b. What role should the private sector and non-profit organizations play in addressing climate change in Puerto Rico, the rest of the territories, and other coastal communities across the nation?

Answer. In addressing climate change, the private sector needs to be more involved in social responsibility in communities. There should be legislation that a certain amount of funding must be invested in non-profit organizations for projects that increase resilience, mitigation, and adaptation in local communities.

Question 3. In his testimony, Secretary Machargo of the Puerto Rico Department of Natural and Environmental Resources indicated that one of the biggest priorities of the Puerto Rico Climate Change Experts and Advisory Committee is the need to acquire an additional NEXRAD Doppler system. As one of the members of the Advisory Committee, would you like to elaborate on this proposal and why it's needed?

Answer. Our Island lost its NEXRAD Doppler Radar TJUA WSR-88D due to wind gust speeds over 200 mph at an altitude above 2,900' in Cayey, Puerto Rico, during Hurricane María. The design wind for this radar lies between 130–150 mph. If we had had an additional radar along the west side of Puerto Rico, we would have had redundancy in the weather infrastructure. Because we lost our radar when the eye of Hurricane Maria was making landfall, we lost historical, scientific data that could have helped in future mitigation practices, develop guidelines for wind speeds design, and if we had another cyclone approaching, we would have been in a very vulnerable position in 2017—bringing humanitarian aid after Hurricane Maria was only possible through the air. Initially, airports had limited capacity, and not having a radar limited our capacity to have a more effective response. It took 9 months after Hurricane Maria that our radar was restored. This is the most important piece of weather observation in Puerto Rico, and it is extremely important for the National Weather Service (NWS) Forecast Office in San Juan, Puerto Rico. This is the only radar of its kind in the Caribbean. Although St. Marten and the Dominican Republic have radars nearby, they do not cover Puerto Rico and are inconsistent in data images. In many coastal states, there is redundancy for weather radars due to geographic areas. The capabilities of TJUA are unique and difficult to match with other remote sensing sensors such as geostationary (GOES-16) and polar satellites. Some of the unique capabilities are not the only categorization of the raindrops, hail, and ice inside of the cloud, but also the ability to detect motion (velocity of these water particles) and the estimation of the rain rates and rainfall accumulation over the islands and the adjacent waters. Forecasters at NWS San Juan continuously utilize radar products to track thunderstorms capable of producing significant rainfall in short periods of time, as well as strong winds that can produce damage across the islands. The importance of the radar increases in relevance when a tropical cyclone approaches the northeast Caribbean region. Local forecasters, as well as the hurricane specialists at the National Hurricane Center in Miami, use the radar to locate the center of the cyclone as it moves near or over Puerto Rico and the U.S. Virgin Islands, while at the same time, using it to estimate rainfall amounts associated with the core of the cyclone and the external rainbands. This is extremely important in islands like Puerto Rico, where the topography focuses on heavy rainfall in some areas across the Island. The utilization of the Doppler radar is maximized during the hurricane season as tropical waves, tropical depressions, tropical storms, and hurricanes threaten Puerto Rico and the U.S. Virgin Islands region, on average, every 3 to 5 days. Marine and aviation operations also benefit from the Doppler radar product suite. For example, radar wind profiles are used daily to estimate the winds in the first few kilometers above the ground, essential to alert pilots about downdrafts and possible crosswinds. Local forecasters can warn mariners about torrential rainfall, strong gusty winds, and waterspouts by using the reflectivity (estimate the intensity of the rainfall) and velocity products. Although most of the remote sensing instruments available for the northeast Caribbean

attempt to estimate the rainfall, the radar is the most reliable doing this task. All in all, the radar is the most effective tool used to issue watches, warnings, advisories, and statements to help core partners to make decisions, as well as alert the people in Puerto Rico, U.S. Virgin Islands, and surrounding waters to save lives and property.

Question 4. I think one of the biggest challenges we face in Puerto Rico when it comes to accessing Federal grants—including those to mitigate the impacts of climate change—is that often individuals, communities, and organizations on the Island simply do not apply for the program, either because they are not aware about the funding opportunity, or because they lack the necessary capacity and knowhow to go through the application process.

4a. Is this something you've seen or experienced yourself?

Answer. Definitely, there is not a centralized grant opportunity center in Puerto Rico. It is difficult to find opportunities to apply for grants and provide services aligned with the federal agencies as well as with the organization. Some agencies include processes that are too complicated for the average community and non-profit organization. I have been lucky to preside an organization that has the capacity to hire grant writers and professionals in the field to access these funds. Without their expertise, it would have been too time-consuming.

4b. In your opinion, should Federal agencies invest more in raising awareness about existing funding opportunities to tackle these issues, building capacity among potential applicants, and simplifying the grant application processes?

Answer. Yes. Federal and state agencies could invest more time in raising awareness about existing funding opportunities to tackle issues as well as building capacity among potential applicants. I know first-hand that the Institute of Museum and Library Services, National Endowment for the Humanities, and National Endowment for the Arts (NEA) has been active in Puerto Rico the past years and have visited the Island and offered workshops as well as one-on-one meetings with constituents on various occasions. This was facilitated by the Instituto de Cultura Puertorriqueña (ICP). This is an example of what I understand are initiatives that help agencies understand the needs first-hand as well as align organizations to the available programs at the different agencies. The NEA sponsored an initiative through ICP to help organizations through capacity building on getting their 501(c)(3) IRS non-profit status, grant writing, and grants management. Organizations need to have a 501(c)(3) to be eligible to apply for federal funding, which becomes crucial particularly during the recovery process and to ensure the sustainability of their organizations. The UPR Resilience Law center is offering a professional certification “Destrezas Legales en la Recuperación Resiliente”. I think one of the most challenging things for our municipalities and non-profits is that there are language barriers; the majority speak and write Spanish yet face limitations with fluent English. USDA translates some of its opportunities, yet I believe it is the only agency that does so, and not for all its programs. Most of the local organizations do not have experience in writing grants. Therefore their capacity to take advantage of the available opportunities is almost non-existent. All federal agencies have different requirements for the grant application process, despite the existence of the 2 CFR 200. There are some agencies whose process is too complicated, instructions unclear, and lack uniformity. For the average person, the process could be unreal and difficult to understand. Simplifying the process for some agencies would help increase the number of grants that Puerto Rico receives. There are other challenges the organizations on the Island could face, particularly the ones that are starting out, such as accessing lines of credit.

Question 5. What would you say is the most critical climate-related concern in Puerto Rico?

Answer. The list was already provided in Question 1.

The CHAIRMAN. Thank you very much.

And before I turn to the Ambassador for his comments, I think Mr. Westerman had a comment or a question, and let me make an effort to recognize him again for his comment.

Mr. Westerman, you are recognized.

Let me return to the witnesses. Mr. Gerald Zackios, Ambassador to the United States, Republic of Marshall Islands.

Mr. Ambassador, the time is yours, 5 minutes. Thank you, sir, for being here. Much appreciated.

**STATEMENT OF HIS EXCELLENCY GERALD M. ZACKIOS,
AMBASSADOR TO THE UNITED STATES, REPUBLIC OF THE
MARSHALL ISLANDS, WASHINGTON, DC**

Ambassador ZACKIOS. Mr. Chairman and distinguished Members.

Thank you, Mr. Chairman, for your leadership regarding the special threats that climate change poses to the Marshall Islands, the RMI, and the other insular jurisdictions of, or freely associated with, the United States.

Thank you, as well, for making it possible for me to complete my testimony in time to meet with President Biden's National Security Advisor at 1 p.m., a time I could not change.

Climate change poses an existential threat to the RMI in a way that it does to only three of the world's other nations. Our highest point of land is less than 6 feet over sea-level rise.

This is also a threat to the defense and economic security of the United States. Our free association gives the United States the right to deny other nations access to a strategic expanse of the Pacific that is nearly 25 percent of the size of the 48 continental United States. Other nations covet shipping lanes in the waters that the United States controls access to now but won't control if the RMI is submerged.

Further, a U.S. Army study found that its Ronald Reagan Ballistic Missile Defense Test Site on our Kwajalein Atoll, which the Joint Chiefs of Staff call, and I quote, "the world's premier range for antiballistic missile testing and space operations support," will be underwater in three decades—that is, if this isn't prevented.

These are the reasons why it is so important for the Committee to prioritize climate change planning, mitigation, adaptation, and resilience in the RMI. It is also why the RMI is applying a climate threat lens to all policies. It is, for example, one of the issues required to be considered in use of compact or free association assistance.

So, we are excited about the draft bill. We also have some suggestions to strengthen it.

First, we respectfully suggest a finding be amended to recognize that sea-level rise is an existential threat to the RMI and this would undermine U.S. economic and defense security.

Second, we respectfully request that all provisions of the bill that address climate change challenges in the U.S. territories apply in the Freely Associated States as well. Most already do, but there are some in which, because of language, do not.

Third, we request that the bill direct the preparation of a report on the impacts of climate change on the Runit Dome nuclear waste storage facility and other hazards in its vicinity at Enewetak Atoll by independent experts agreed by both of our governments. Such a study would cover major gaps in a joint 2020 report by the Department of Energy required by law. It should propose options

to remedy all of the contaminants left on Enewetak, including its lagoon, and mitigate related threats due to climate developments.

The United States conducted nuclear testing equal to the force of 1.6 Hiroshima-size bombs every day for 12 years while it administered our islands as trustee for the U.N. The remaining nuclear waste and other contaminants are now threatened by sea-level rise. Recent leakage from the dome has generated concern from Hawaii and the U.N. Secretary-General while he was in Fiji.

Fourth, we advise adding the Defense Department to the bill's insular interagency task force. The RMI would also benefit from technical support from the Interior Department's Fish and Wildlife Service and the Commerce Department's National Marine Fisheries Service Honolulu office.

Finally, we would like to discuss with the Committee staff how some specific projects can be funded. One is for a solar power system for the islands of Wotje, Jaluit, Rongrong, and Santo and to fully transition Ebeye, Kwajalein, and other atolls to renewable energy.

Another would improve sea-level-rise data, defining the actual risk for each of our communities. We also need assistance for our Reimaanlok Process, which guides our planning in sea-level rise.

And we propose an Atoll Research Center of Excellence at the College of Marshall Islands to consolidate research not only for the RMI but for all insular areas.

Thank you again for your attention and again for your leadership. I would be pleased to answer any questions and look forward to working with the Committee on this legislation.

The RMI is fortunate that the Committee remembers that the RMI is a member of the U.S. extended political family, inextricably but voluntarily linked for an unlimited future.

I thank you, Mr. Chair.

[The prepared statement of Ambassador Zackios follows:]

PREPARED STATEMENT OF HIS EXCELLENCY GERALD M. ZACKIOS, AMBASSADOR OF
THE REPUBLIC OF THE MARSHALL ISLANDS

INTRODUCTION

Thank you, Mr. Chairman, for your leadership regarding the special threats that climate change poses to the Republic of the Marshall Islands (RMI) and other insular jurisdictions or freely associated with the United States.

I am here to testify on behalf of my Government and people regarding the existential threat climate change poses to the RMI, and to the enduring resilience that is the objective of our response to this global threat.

I do not use the words "existential threat" lightly—or even in the way it is in the case of most nations. As a country with its highest point less than six feet above the rising sea level—one of the four lowest lying nations in the world—our islands' very existence is challenged.

And this is a threat to the defense and economic security of the U.S. Our free association gives the U.S. the right to deny other nations access to a strategic expanse of the Pacific that is nearly 25% of the size of the 48 continental United States and the District of Columbia. The RMI's concession to the U.S. in this regard is extraordinary for a sovereign nation. And another nation covets access to our waters.

BACKGROUND

Fundamentally, "resiliency" can be defined as the empowerment of individuals to make the most of their opportunities and resources so that families and communities can adapt to changing circumstances, including the environment. The Marshallese people have proven their resiliency time and again, building a strong

society and a thriving culture on islands buffeted by colonialism, war, and devastating nuclear bomb testing. As we confront the impacts of climate change, my Government is drawing on, respecting, and nurturing the fundamental resilience of our people as we chart our course for the future.

“Resilience” in all its dimensions, including environmental, social, and economic resilience serves as the foundation of our 2020–2030 National Strategic Plan (NSP). It provides a development and progress roadmap for RMI. Building the resilience of our people and ecosystems is necessary for sustainable development and for protecting our natural capital and strengthening our human capital. It is essential for meeting our national development objectives as well as for ensuring the sustainability of economic growth regardless of the environmental impacts that we may face in the future.

Like so many communities placed in peril by today’s global climate emergency, the RMI’s future relies upon urgent and enhanced mitigation and adaptation action.

As a coral atoll nation, the RMI is a nation made up entirely of coastline. Our country comprises 1,156 individual islands and 29 different atolls with an average elevation of less than six feet above sea level. We have no interior or higher ground to which to retreat. We are acutely and chronically vulnerable to the dangers of rising seas and other impacts that are accelerating with climate change, constituting a real, existential risk should the global average temperature exceed 1.5 degrees Celsius above pre-industrial levels.

King tides, intrusion of salt water into freshwater resources, and the difficulties of growing food have exacerbated the challenges of the harsh atoll environment. We are also facing increased health challenges as a result of climate change. Scientists have determined that dengue fever and other mosquito-borne illnesses are increasing as climate change worsens, and our country has been experiencing this firsthand. From October to January 2020, our hospitals were overwhelmed with dengue fever patients.

While the RMI only contributes 0.00001% of global greenhouse gas (GHG) emissions, it has a proud history of prominent climate leadership, at home as well as on the world stage.

Following a global fuel price spike in 2008, the RMI declared a National Economic Emergency and has since then rapidly embraced renewable energy technologies and taken huge strides in energy efficiency. Our Electricity Roadmap provides a strategic framework to enable us to meet our climate change targets and to strengthen our role as a climate leader. This roadmap will allow us and our development partners to work together to achieve a common vision for the RMI’s electricity sector.

Over the last 15 years, progress has been made in developing renewable energy, and as a result, almost all households on the outer islands, previously without electricity, now have solar home systems, and several larger solar projects, totaling around 1 megawatt (MW), have been built on Majuro. In addition, in 2016, the RMI committed, under the Marrakech Partnership, to achieving 100% renewable energy by 2050.

On the international stage, the RMI spearheaded the 2013 Majuro Declaration for Climate Leadership, which sought to demonstrate the Pacific’s adoption of some of the world’s most ambitious GHG emissions reduction targets. In 2015, it played a key role in securing the Paris Agreement. It was also the first Small Island Developing State to submit its climate commitment (i.e., nationally determined contribution) under the Agreement. The commitment was ground-breaking in that it contained the first economy wide absolute GHG emissions reduction target against a base year by a developing country.

In 2018, the RMI was also the first nation to submit its enhanced climate commitment under the Agreement. The RMI is also the founder of the High Ambition Coalition (HAC) which it continues to convene. And we are also working to achieve net zero emissions by 2050 as outlined in our *Til Eo 2050* Climate Strategy, the RMI’s long-term low greenhouse gas emission climate-resilient development strategy under the Paris Agreement. This Strategy is our roadmap to embark on a low-carbon, blue-green economy development trajectory that emphasizes efficient use of natural resources.

As climate change continues to wreak havoc worldwide, the RMI is acutely aware of our vulnerabilities and that policies to address climate change must not only continue to support mitigation efforts, but also to continue to provide support for adaptation—especially for atoll nations, which are uniquely vulnerable. Adaptation is central to our continued ability to exercise our national right of self-determination—our ability to govern our territory, sustain our culture, and protect our people. And we recognize the importance of taking a holistic, ecosystem-based approach to adaptation and resiliency in our country to respond to the impacts of climate change.

However, as an atoll nation, the RMI does not have the luxury to pick and choose from a wide range of options and adaptation pathways to respond to the impacts of climate change and long-term sea-level rise. Nor is there an optimal solution that will create a ‘safe haven’. Adaptation will be a continuous journey involving a range of inter-relating activities, the composition of which will vary from location to location, and over time along each particular pathway.

At times, the particular pathway may need to change as the magnitude of sea-level rise results in the initial path no longer providing the level of security required for the community, development, or infrastructure.

The RMI’s adaptive capacities will need to move from consideration of single independent options, for example, a focus on seawalls only, to a consideration of a progressive mix of “hybrid” options that work together to respond to the longer-term sea-level rise challenges and provide more effective or longer-term pathways.

Adaptation responses could include maintaining or restoring the effectiveness of the complete natural coastal defense system; moving from slab concrete foundations to pile foundations, enabling property to be raised up or more easily relocated; and constructing “backstop” protection measures that reduce over-topping impacts on properties and development.

Our National Strategic Plan also recognizes that improved national and local capacity to undertake vulnerability and adaptation assessments and planning is critical for disaster risk management. We are focused on ensuring that all stakeholders are integrated into the planning and implementation of disaster risk and adaptation as needed.

Our goal through ambitious adaptation action is to avert, minimize, and address loss and damage from climate change. Under current global emission projections, however, we cannot rule out scenarios where adaptation measures will not be sufficient to protect our people, our land, and our livelihoods. This would result in a real threat not only to basic social and economic development, but to our integrity as a nation.

Despite our extensive efforts, the RMI recognizes that we cannot fulfill our climate adaptation plans alone. In order to protect our nation for future generations from loss and damage, and even to fully decarbonize our economy, the RMI needs financial and technical support to implement ambitious climate adaptation and mitigation projects.

On the frontlines of the climate crisis, we are also uniquely placed to share our stories and exchange best practices with others who will face similar climate impacts in the future. As a leader on both climate adaptation and mitigation practices, we are open and willing to share our firsthand understandings of climate change and how our communities are building resilience so that others can learn.

IMPACT OF CLIMATE CHANGE ON THE RMI AND U.S. INTERESTS

That is why this hearing is so important today. We greatly appreciate that the Committee has chosen to prioritize the importance of providing for climate change planning, mitigation, adaptation, and resilience in the U.S. territories and freely associated states.

We enthusiastically support the draft bill. In this regard, we also have some suggestions to strengthen it that we respectfully request you consider.

The U.S. is our closest partner. We have a joint history that includes the U.S. intentionally helping shape our modern society to bind us to you. We share values, norms, and personal ties. Our long-standing alliance is reflected in the Compact of Free Association and related agreements and laws.

When these were first adopted in 1986, few understood the far-reaching consequences of climate change. Today, the situation is very different. The science and our own lived experience are clear: we face a climate crisis, intersecting with the RMI’s geography and its legacies of colonialism and nuclear testing.

As the bill under discussion outlines, insular areas are experiencing sea level rise, coastal erosion, and increasing storm impacts that threaten lives, critical infrastructure, eco-systems, and livelihood security. And moreover, temperature increases are likely to create and intensify the length of droughts, reduce water supply, impact public health, and increase demand of freshwater in these areas.

In the RMI specifically, other impacts include higher demand on energy and damage to energy infrastructure causing more power outages. In addition, changes in ocean temperature and acidification will increase the risk of coral bleaching and reduce yellowfin and skipjack tuna catch by up to 31% in 2100 in the RMI EEZ, with consequences for subsistence fishing and food security and decreasing the revenue from the selling of fishing licenses.

Indeed, the Marshall Islands considers climate change our most significant security threat. There is a potential for cascading fragility and instability risks tied to issues such as displacement and forced migration to U.S. areas, increased social tensions linked to access to land and fisheries resources, reduced coping capacity in the face of more frequent natural disasters, and the impact of sea level rise on national maritime zones and boundaries, among others. When a wider regional security lens is considered, including regional fragility and geopolitical influence efforts from the People's Republic of China among other entities, it is beyond question that climate impacts couple with other factors to sharply intensify an already difficult regional landscape on security issues.

These climate impacts have direct consequences for U.S. economic and security interests. The most extensive for the U.S. is that the access of other nations to the expanse of the Pacific the U.S. controls through our free association can be reduced or totally eliminated due to sea level rise in the RMI.

Further, a study for the U.S. military found that the Ronald Reagan Ballistic Missile Test Site on our Kwajalein Atoll—which the U.S. Joint Chiefs of Staff have called “the world’s premiere range for anti-ballistic missile testing and space operations support”—will be underwater in three decades, unless this is prevented. If it is not countered, the U.S. will lose an essential and virtually irreplaceable facility. In addition, it could allow hazardous chemicals and toxins to flow into the Pacific.

A 2014 USGS, NOAA, Deltares, and University of Hawaii study¹ to understand the impact of climate change and sea-level rise on Roi-Namur Island of Kwajalein Atoll found that the impact of sea-level rise combined with annual wave-driven flooding could overwhelm much of the isthmus that connects the island’s Roi and Namur portions on an annual basis, negatively impacting the facilities on both.

Further, without active management measures, the annual amount of seawater flooding onto the island during storms will be of sufficient volume to make the groundwater non-potable year-round. Management practices such as post-flood short-term intensive withdrawal and artificial recharge will allow for 3–4 months of potable groundwater during the rainy season at higher sea levels. The sustainability of such operations over the long term with increasing frequency and intensity of wave-driven flooding and island over-wash is, however, not clear.

And many of the adjacent islands on Kwajalein Atoll that are inhabited by and/or have U.S. Department of Defense facilities (Ebeye, Ennylabegan, Ebadon, Ennubirr, Gagan, Gellinam, Gugeegue, Illeginni, Legan, Meck, Omelek) will face a similar fate. This includes the homes of much of the facility’s workforce.

Given these risks, climate change must be integrated as a central component of all development, financial and infrastructure-wise in the RMI. Any development investments in our islands that fail to account for the effects of climate change are not viable. It is for this reason that the RMI adopted a whole-of-government approach to addressing climate change some years ago, working to apply a climate lens across all sectors and in all policies.

Our 2020–2030 National Strategic Plan (NSP) underscores the importance of taking a holistic approach to addressing climate change, requiring strengthened coordination and decision making across all stakeholders including government, private sector, NGOs, and civil society. A holistic approach also includes mainstreaming climate-related risks into planning and budgeting at all levels and in all relevant sectors. It also requires ensuring that relevant organizations are adequately resourced and that avenues for sustainable financing are secured.

Compact-driven assistance (including Sector Grants and Trust Fund disbursements), like other external assistance, including donor nation construction projects, is now required by RMI law to be ‘climate-proofed’ to the extent practicable, pursuant to Section 615(4) of the Ministry of Environment Act, which was enacted in 2019. There are similar provisions governing public and private undertakings.

Compact-driven assistance accounts for a large portion—by some accounts about half—of our national budget. So, utilization of existing and future Compact-driven projects to address climate and environmental resilience represents a tremendous opportunity to help safeguard and protect our mutual public investments in RMI’s future.

But even with these legal provisions, Compact funds and projects are being implemented now, as they have been for decades, without accounting for projected future risks, in particular sea-level rise.

The bill under consideration represents an ideal opportunity for the U.S. Government to take into account commitments in RMI law to achieve climate-proofing or environmental resilience of both Compact and general assistance activities. Also to

¹ https://climateandsecurity.files.wordpress.com/2018/03/serdp-slr-and-pacific-military-installations_2017_08.pdf.

reflect those commitments, including through dedicated technical assistance and directives to decision-making concerning the Freely Associated States, including the Department of Interior's Insular Affairs Office, or, the bill's interagency insular task force.

It will also be important to consider means to address both existing interagency efforts under the Compact, related reporting obligations, and the insular climate task force. The absence of such a directive and mandate will likely mean that existing U.S. assistance to and engagement with Freely Associated States will continue as it is now, without consideration of climate change, and, in particular, sea-level rise.

The U.S. commitment to the Freely Associated States, including the RMI, should not only include technical and grant assistance, but also a clear and specific commitment to ensure that U.S. investment in the Freely Associated States will be climate and environmentally-resilient, including in regard to sea-level rise. In providing support to RMI, the U.S. must consider how climate change impacts everything in free association extension negotiations from research for environmentally-sound plans for sea walls to other means of infrastructure protection from climate impacts.

And while climate change adaptation issues have been integrated into base-wide environmental standards as agreed and revised by both RMI and the U.S. since 2016, a wider and informal discussion can provide a platform for joint collaborative efforts and information exchange on climate and environmental resilience efforts in the Marshall Islands. However, from one example, prior U.S. administrative mandates and guidance regarding agency decision-making on adaptation, including Executive Order 13653 of 2013, did not fully translate down to Compact-level outcomes. As such, accountability to ensure climate change is considered in all decision-making is critical.

We, therefore, look to the U.S. to be a partner for the challenges ahead that will undoubtedly be created and exacerbated by climate change.

RUNIT DOME AND ENEWETAK ATOLL

One challenge in particular that merits urgent action is the Runit Dome and its surrounding area and lagoon at Enewetak Atoll. For us, this is an everyday reminder of the intersection of the two major challenges facing the RMI, our nuclear legacy and sea level rise. But for the world, there may be no more dramatic example of the dangers of climate change. And the Runit problem now threatens not only the health of the residents of Enewetak and but areas beyond. It has generated concern from Hawaii and from the Secretary General of the U.N. while in Fiji.

Our nuclear legacy includes the U.S. detonating 67 bombs over 12 of the years in which U.S. administered our islands as trustee for the United Nations. The explosions had a force and radiation equal to 1.6 Hiroshima bombs being detonated every day for 12 years.

The Dome, built in the late 1970s, contains more than 3.1 million cubic feet of radioactively contaminated soil and debris that were dumped into a nuclear bomb test crater, the Cactus Crater, on the north end of Runit Island and covered by a concrete dome. A fatal error was to not, as originally planned, cover the underlying sand with concrete.

American legal scholars caution that this standard for storing nuclear waste in the RMI would not be sufficient to store household garbage in the United States. There is a glaring discrepancy between standards of safety implemented by DOE in the RMI vs. in the United States.

The Runit Dome is located less than 14 miles from Enewetak Island, the population center for the atoll. The Dome is unsecured by any fencing or barriers to protect the nearby local population from exposure to the many toxins that remain at Runit Island.

Radioactive material is already leaking out through the sand base under the dome. It threatens the population area and the Pacific, affecting fish stocks and our coral reefs.

Concerned, the Congress by law directed the U.S. Department of Energy to submit a report on the situation and danger.

The report delivered by the last U.S. Administration in June 2020, however, did not adequately respond to the Congress' concerns. It asserted that the Dome was not in any immediate danger of collapse or failure and concluded that the contents within the Dome are not expected to have any adverse effect on the environment at present or in 5, 10, or 20 years.

It also, however, somewhat contradictorily, acknowledged that there is a need for additional groundwater study. This study, though, was mandated by Congress in 2012 and still remains in its initial stages.

An absence of data to show harm does not mean that there is no harm. Moreover, an analysis that only monitors the groundwater inside the dome and its immediate surroundings cannot accurately assess safety impacts on the local Enewetak community.

Further, the DOE report was deficient in that it did not include information on the many radionuclides that are still present in or around the Runit Dome that were either buried in “crypts” or dumped in the lagoon and ocean.

Likewise, the report makes no mention of the presence of hazardous materials resulting from biological and chemical weapons tests.

DOE used an international radiation safety standard of 100 mrem annual dose limit. The RMI continues to demand that the U.S. Government clean its radioactive mess in the RMI to the same standard it would use in the U.S. since the bombing occurred when the RMI was administered in trust by the U.S. Equity with the U.S. was the basis for the Nuclear Claims Tribunal’s adoption of adopted a 15 mrem radiation safety standard based on that used by the U.S. EPA for similar waste sites in the U.S.

The report is also not peer-reviewed, evidenced by the report’s extensive citation of studies carried out by DOE’s principal contractor and report author.

Additionally, however, A DOE employee told us that an astounding 99% of the plutonium is not under the Dome but is in the lagoon! This was confirmed by a 2013 study conducted by the Lawrence Livermore National Laboratory for the DOE.

The U.S. Government acknowledges that there were three dumping sites for radioactive material in Enewetak’s lagoon, and we have been informed by people who participated in the radiological cleanup of Enewetak Atoll that, contrary to what the U.S. Government had reported, highly radioactive waste was dumped into the lagoon. Cleanup participants have also informed us that after the Dome was sealed, additional radioactive waste was buried in crypts that we were never informed about.

The community that was removed from Enewetak for the bombing but has since been resettled there has raised concerns about desalinization from the lagoon for drinking water and how, during storms, the radioactive materials normally on the bottom of the lagoon are resuspended in the water.

Former U.S. personnel have also recently disclosed that hundreds of pounds of highly toxic beryllium were spilled over Enjebi Island in Enewetak Atoll in a failed rocket test. This, too, is outside the scope of what DOE addressed.

We have, additionally, been made aware that Enewetak Atoll was used as a base for testing chemical and biological warfare agents. The details and environmental impacts of these tests have never been disclosed to us, and this also has been excluded from the DOE report.

We were, further, recently shocked to learn that were also radionuclides brought into Enewetak from Nevada, which were not released from the nuclear weapons tests, but used to cover an accident during a weapons test. The imported radiation from Nevada is different from the forms of radiation released by the detonations in the RMI. Yet again, this is not included in current DOE or U.S. Government accounting to the RMI about environmental health risks on Enewetak.

So, we are concerned that rising sea levels and violent storms at Enewetak Atoll could cause significant environmental damage not only because of Runit Dome, but also because of the nuclear waste that was dumped into the lagoon or buried in undisclosed crypts, and also because of radionuclides and other toxins that may have been left on the land and water as a result of various U.S. military activities. Among many other aspects of the issue, we are extremely concerned about the safety of the groundwater that the people of Enewetak depend upon as their water source.

We also recognize that risks of nuclear exposure, compounded by the risks of climate change, are likely to increase Marshallese migration to Guam, the Northern Mariana Islands, and Hawaii and other U.S. States. Within the RMI there are already substantial migration flows between islands, particularly from outer islands to the capital, Majuro, and to Ebeye, near the U.S. Kwajalein base. The number of Marshallese residing in the U.S. has rapidly risen over the past two decades, from 7,000 in the year 2000 to 22,000 in 2010, to an estimated 30,000 today.

These environmental hazards at Enewetak Atoll are the legacy of activities that the U.S. conducted during a period when it was acting as the trustee for the RMI. We did not request these activities and have indeed paid a steep price for them—including loss of life, severe birth defects, and loss of safe access to our lands, waters, and homes.

Environmental and climate justice would require, at a minimum, that the U.S. assist us in evaluating and mitigating these risks created by U.S. Government actions.

AMENDMENTS

With all this in mind, we are pleased to identify additional ways that U.S. support can help the RMI achieve its climate-related goals and plans through the draft bill.

First, concerning the existing text, we respectfully suggest that the Findings be amended to recognize that sea level rise from climate change is an indisputable existential threat to the RMI because of its low elevation and that this would substantially undermine the economic and defense security of the U.S.

Second, we respectfully request that all provisions of the bill that provide means of addressing climate change challenges apply to the freely associated states as well as to the U.S. territories. Most already do but there are some which, due to language, do not.

Third, we request that the bill be amended to direct the preparation of a report on the impacts of climate change on the Runit Dome and on other environmental hazards in its vicinity, prepared by independent experts agreed to by both of our governments. Legislative language for such a study—which would cover the major gaps in the June 2020 DOE report—is attached to my statement.

It is imperative that this study include concerns about safety identified by the resettled community and includes their knowledge about the interactions of the Dome and the surrounding ecosystem. The study needs to go beyond the DOE's June 2020 study and be inclusive of local knowledge and account for all the ways in which the Runit Dome and toxins outside the Dome are interacting and impacting the local environment, including the potential risks posed to the nearby population.

Most importantly, the study should propose options for how the various environmental hazards left on Enewetak Atoll can be remediated and how threats from possible climate-induced events can be mitigated.

Finally, we would like to discuss with the Committee staff how some specific projects to address the existential threat of climate change to the RMI and U.S. interests in the RMI can be funded.

One requires \$14.6 million to fund PV solar systems for the islands of Wotje, Jaluit, Rongrong, and Santo and an additional \$9.5 million to fully transition Ebeye in Kwajalein Atoll to renewable energy.

To achieve our ambitious mitigation targets to fully decarbonize by 2050, the RMI's energy sector must quickly transition to over 50% renewable energy by 2030. We have in place an Electricity Roadmap with costed, technically sound renewable energy pathways for our electricity sector to make this transition. While work under the Electricity Roadmap under its three key components—Human Resources, Renewable Energy (RE) Technologies, and Investment—is progressing, significant financing gaps remain. The \$25.1 million total for the projects I outlined is needed to achieve the 2030 target.

While planning is underway in the RMI to address adaptation options, information is currently lacking on accurate surveyed data to make informed decisions on adaptation, development, and disaster risk plans. Therefore, the RMI has planned two specific projects to improve our quality of survey data.

First, accurate data to measure land levels relative to the sea is essential. These relative levels will define the actual risk of sea level rise for each community and the absence of accurate land level data will hinder development of effective adaptation measures.

Aircraft-based remote sensing using LIDAR (Light Detection and Ranging) is one of the most promising land survey technologies. It uses light in the form of a pulsed laser to measure ranges to the Earth. These light pulses—combined with other data recorded by the airborne system—generate precise, three-dimensional information about the shape of the Earth and its surface characteristics. A LIDAR instrument principally consists of a laser, a scanner, and a specialized GPS receiver. Airplanes and helicopters are the most commonly used platforms for acquiring LIDAR data over broad areas. There are topographic LIDARs, which typically use a near-infrared laser to map the land, and bathymetric LIDARs, which uses water-penetrating green light to measure seafloor and riverbed elevations.

Aircraft-based LIDAR surveys were undertaken in 2019 on Ebeye and Majuro, the two most populated areas of RMI. These found significant differences from previous assumptions, providing valuable information for the design of sea level adaptation measures. It is very important to conduct similar surveys on the 10 other most populous atolls in RMI. Based on the cost of the previous surveys, the budget for LIDAR surveys of the 10 other atolls would be \$5.55 million.

To break this down: \$250,000 would be needed for mobilization to and from the RMI, \$300,000 for re-mobilization from Majuro to the 10 different atolls, and the total for acquisition and processing, at \$50,000 per flight for 10 flights per atoll

would be \$5 million. This would assume each flight would consist of a survey speed of 140 knots, at an altitude of 1,400 feet, with spot spacing at 2.8 x 2.8 meters.

Second, enhanced land and survey data to develop digital elevation maps and flood risk models will be another critical element to help implement our National Adaptation Plan, disaster response plans, and other development goals. Our technical experts have identified the Trimble 10, sold by Frontier Precision, as the best equipment available to fulfill this task. The Rover has the capacity to reach some of the more inaccessible outer atolls.

Funding to survey and produce the relevant maps necessary for planning and disaster response for all of the islands in the RMI would be critical. Estimated costs for this project have already been produced and amount to \$103,999.12. This would include funding for the Trimble 10, a rechargeable battery, pole mount, keypad, transport case, GPS tripod, rover road, and online training to use the equipment, among other costs.

In addition, while the development of a National Adaptation Plan is ongoing to address the full range of adaptation needs across all sectors, the RMI has frameworks and implementation plans already in place to advance coastal and marine resiliency. Thus, the RMI's National Oceans Symposium Plan along with the Reimaanlok Process, guides ongoing work that depends on science-driven, nature-based, and integrated planning solutions.

\$6.3 million is needed to cover outstanding costs in several categories of work. These include legal and regulatory, human resource/capacity development, data collection, management, and information sharing, public awareness and education, networking, and partnerships, and, finally, new projects in conservation, management, and livelihoods.

The RMI also needs U.S. agency technical support. This includes help from the Interior Department's Fish & Wildlife Service Honolulu field office and the Department of Commerce's NOAA National Marine Fisheries Service Honolulu office. It would be in keeping with their existing roles within conservation efforts and scientific inventories for U.S. islands and monuments in the Pacific, as well as at Kwajalein Atoll.

It would also be important to clarify that existing technical grant references include these entities as relates to their mandate to provide technical support to the Freely Associated States regarding climate and conservation work.

It would be beneficial to enhance the insular interagency task force by requesting U.S. Defense Department participation as well as a mandatory follow-up on implementation from the bill's insular task force.

This follow-up should consider existing annual reporting. It should also provide Congress and the RMI with accountability as well as any U.S. efforts to work with the Freely Associated States to coordinate U.S. activities. It should, further, report on relevant bilateral and multilateral sources of assistance from other partners, and the extent to which the RMI and the FAS have engaged or benefited from such sources.

Research and education to ensure that the RMI has the most current data available to make science-based policy decisions related to climate change is, essential, of course. An Atoll Research Center of Excellence housed at the College of the Marshall Islands would be a good way to consolidate research related to the long-term viability of atolls, not only in RMI, but in all insular areas.

A range of research areas may be considered that are relevant to all atoll nations, including aquaculture, habitat rehabilitation, and Blue Economy related innovations and partnership modalities that embrace environmental assessment and management. The Center could create formal links with U.S. universities, including the University of Hawaii, to help share world-class expertise and innovation to help address challenges like food security that are confronting marginal environments.

Support is needed to not only develop a strategic plan for the Center, but also to determine its operation and financial sustainability over time. Initial U.S. seed funding of \$200,000 would help to get this project off the ground. Additional sums would be needed later for implementation.

Mr. Chairman and Members, thank you for your attention and, again, for your leadership. I would be pleased to answer any questions and I look forward to working with the Committee and its staff on this legislation.

The RMI is fortunate that the Leadership, Members, and staff of this Committee remember that the RMI is a member of the U.S.' extended political family, inextricably, but voluntarily linked for an unlimited future.

See attachment to Mr. Zackios' testimony below.

Attachment:

SEC. __. REPORT ON RUNIT DOME AND RELATED HAZARDS

(a) **IN GENERAL.**—Not later than 1 year after the date of enactment of this Act, the Secretary of the Interior shall submit to the Committees on Natural Resources and Energy and Commerce of the House of Representatives, and to the Committee on Energy and Natural Resources of the Senate, a report, prepared by independent experts not employed by the U.S. Government, on the impacts of climate change on the “Runit Dome” nuclear waste disposal site in Enewetak Atoll, Marshall Islands, and on other environmental hazards in the vicinity thereof. The report shall include:

(1) A detailed scientific analysis of any threats to the environment, and to the health and safety of Enewetak Atoll residents, posed by each of the following:

- (A) the “Runit Dome” nuclear waste disposal site;
- (B) crypts used to contain nuclear waste and other toxins on Enewetak Atoll;
- (C) radionuclides and other toxins present in the lagoon of Enewetak Atoll, including areas in the lagoon where nuclear waste was dumped;
- (D) radionuclides and other toxins, including beryllium, which may be present on the islands of Enewetak Atoll as a result of nuclear tests and other activities of the U.S. Government, including tests of chemical and biological warfare agents, rocket tests, contaminated aircraft landing on Enewetak Island, and nuclear cleanup activities;
- (E) radionuclides and other toxins that may be present in the drinking water on Enewetak Island or in the water source for the desalination plant; and
- (F) radionuclides and other toxins that may be present in the groundwater under and in the vicinity of the nuclear waste disposal facility on Runit Island.

(2) A detailed scientific analysis of the extent to which rising sea levels, severe weather events and other effects of climate change might exacerbate any of the threats identified above.

(3) A detailed plan, including costs, to relocate all of the nuclear waste and other toxic waste contained in (A) the “Runit Dome” nuclear waste disposal site, (B) all of the crypts on Enewetak Atoll containing such waste and (C) the three dumping areas in Enewetak’s lagoon to a safe, secure facility to be constructed in an uninhabited, unincorporated territory of the United States.

(b) **MARSHALLESE PARTICIPATION.**—The Secretary of the Interior shall allow scientists or other experts selected by the Republic of the Marshall Islands to participate in all aspects of the preparation of the report required by subsection (a), including, without limitation, developing the work plan, identifying questions, conducting research, and collecting and interpreting data.

(c) **PUBLICATION.**—The report required in subsection (a) shall be published in the Federal Register for public comment for a period of not fewer than 60 days.

(d) **PUBLIC AVAILABILITY.**—The Secretary of the Interior shall publish the study required under subsection (a) and results submitted under subsection (b) on a public website.

(e) **AUTHORIZATION OF APPROPRIATION FOR REPORT.**—It is hereby authorized to be appropriated to the Department of the Interior, Office of Insular Affairs for fiscal year 2022 such sums as may be necessary to produce the report required in subsection (a).

(f) **INDEFINITE AUTHORIZATION OF APPROPRIATION FOR RUNIT DOME MONITORING ACTIVITIES.**—It is hereby authorized to be appropriated to the Department of Energy such sums as may be necessary to comply with the requirements of 48 USC 1921b(f)(1)(B).

QUESTIONS SUBMITTED FOR THE RECORD TO HIS EXCELLENCY GERALD M. ZACKIOS,
AMBASSADOR TO THE UNITED STATES, REPUBLIC OF THE MARSHALL ISLANDS

Questions Submitted by Representative Sablan

Question 1. Perhaps no other nation has been forced to adapt to the effects of climate change as much and as quickly as the Republic of the Marshall Islands. Rising sea levels are submerging more and more of the highly limited land. Fresh water aquifers are threatened by flooding saltwater. Many residents are having to relocate. What do you think can be done to stem the disastrous impacts of climate change for the Marshall Islands? How can this legislation help the Marshalls? What else might be needed?

Answer. First, concerning the existing text, we respectfully suggest that the Findings be amended to recognize that sea level rise from climate change is an indisputable existential threat to the RMI because of its low elevation and that this would substantially undermine the economic and defense security of the U.S.

Second, we respectfully request that all provisions of the bill that provide means of addressing climate change challenges apply to the freely associated states as well as to the U.S. territories.

Third, we request that the bill be amended to direct the preparation of a report on the impacts of climate change on the Runit Dome and on other environmental hazards in its vicinity prepared by independent experts agreed to by both of our governments. Legislative language for such a study—which would cover the major gaps in the June 2020 DOE report—is attached to my statement.

It is imperative that this study include concerns about safety identified by the resettled community and includes their knowledge about the interactions of the Dome and the surrounding ecosystem.

Most importantly, the study should propose options for how the various environmental hazards left by the U.S. at Enewetak Atoll can be remediated and how threats from possible climate-induced events can be mitigated.

Finally, we would like to discuss with the Committee staff how some specific projects to address the existential threat of climate change to the RMI and U.S. interests in the RMI can be funded.

One requires \$14.6 million to fund PV solar systems for the islands of Wotje, Jaluit, Rongrong, and Santo and an additional \$9.5 million to fully transition Ebeye in Kwajalein Atoll to renewable energy.

While planning is underway in the RMI to address adaptation options, information is currently lacking on accurate surveyed data to make informed decisions on adaptation, development, and disaster risk plans. Therefore, the RMI has planned two specific projects to improve our quality of survey data.

First, aircraft-based remote sensing using LIDAR (Light Detection and Ranging) is one of the most promising land survey technologies. Aircraft-based LIDAR surveys were undertaken in 2019 on Ebeye and Majuro. These found significant differences from previous assumptions, providing valuable information for the design of sea level adaptation measures. It is very important to conduct similar surveys on the 10 other most populous atolls. The estimated budget is \$5.55 million.

Second, enhanced land and survey data to develop digital elevation maps and flood risk models will be another critical element to help implement our National Adaptation Plan, disaster response plans, and other development goals. Estimated costs for this project have already been produced and amount to \$103,999.12.

In addition, while the development of a National Adaptation Plan is ongoing to address the full range of adaptation needs across all sectors. \$6.3 million is needed for work in the areas of legal and regulatory requirements, human resource/capacity development, data collection, management, and information sharing, public awareness and education, networking, and partnerships, and, finally, new projects in conservation, management, and livelihoods.

The RMI also needs technical support from the Honolulu offices of the Interior Department's Fish & Wildlife Service and the Department of Commerce's NOAA National Marine Fisheries Service.

It would also be beneficial to enhance the bill's insular interagency task force through U.S. Defense Department participation.

Task Force follow-up should consider existing annual reporting. It should also provide Congress and the RMI with accountability as well as any U.S. efforts to work with the Freely Associated States to coordinate U.S. activities. It should, further, report on relevant bilateral and multilateral sources of assistance from other partners, and the extent to which the RMI and the FAS have engaged or benefited from such sources.

Research and education to ensure that the RMI has the most current data available to make science-based policy decisions related to climate change is, of course, essential. An Atoll Research Center of Excellence housed at the College of the Marshall Islands would be a good way to consolidate research related to the long-term viability of atolls, not only in RMI, but in all insular areas. Support is needed to not only develop a strategic plan for the Center, but also to determine its operation and financial sustainability over time. Initial U.S. seed funding of \$200,000 would help to get this project off the ground. Additional sums would be needed later for implementation.

Questions Submitted by Representative Porter

Representative Porter has heard from constituents about a lack of access to clear, concrete information about issues of interest of the RMI and the Marshallese diaspora including climate change as well as the legacy of nuclear weapons tests.

Question 1. From 1946 to 1958, the U.S. conducted 67 atmospheric atomic and thermonuclear weapons tests over the Marshall Islands atolls of Bikini and Enewetak. In addition to fallout from these tests, the U.S. dumped unknown quantities of radioactive and toxic waste in the lagoon at Enewetak and buried additional radioactive and toxic waste in storage crypts on the atoll.

1a. Does the RMI believe it has a complete accounting of the waste dumped into the lagoon at Enewetak, including and quantity and composition?

Answer. The RMI does not have an accounting of the waste dumped into the lagoon at Enewetak. The Radiological Cleanup of Enewetak Atoll, a report issued by the Defense Nuclear Agency in 1981,¹ does provide some information about the dumping of radioactive. Page 220 describes the purported maximum levels for alpha, beta, and gamma radiation levels. The waste appears not to have been screened for other toxins that likely would have been present.

We have not been informed of the quantity of radioactive and other waste that was dumped.

Some of the information that we have gathered from declassified U.S. Government reports raises more questions than it provides answers. For example, Page 403 of the report discloses the following about a failed nuclear test: "In the Quince event of Operation Hardwick I in 1958, only the highly explosive component was detonated, scattering plutonium over a large area. To prepare for the Fig event scheduled 12 days later, 3 to 5 inches of contaminated soil were removed from a 60-foot square around the Quince GZ and disposed of in the lagoon." There is no indication of whether this plutonium-contaminated soil met the U.S. Government's declared standards for waste to be dumped in the lagoon.

Additionally, the U.S. Defense Nuclear Agency acknowledged in a 1982 report that over 130 tons of soil from the Nevada Test Site had been transported to Enewetak.² This soil from Nevada was spread on the site of the failed Quince test for reasons that have not been disclosed to the RMI.

Since the soil was from the Nevada Test Site, we presume that it was contaminated. Since the soil had to be applied during the 12-day window between the failed Quince test and the Fig test, it, presumably, was already on Enewetak at the time of the Quince test. Our suspicion is that the U.S. Government was keeping a larger stockpile of contaminated soil imported from Nevada on Enewetak to be applied in the event of a failed test, and we further suspect that the stockpile would have been much larger than the 130 tons that were spread after the Quince test. We, further, suspect that the remaining contaminated soil imported from Nevada may have been dumped into the lagoon. The RMI would appreciate an explanation from the U.S. Government.

1b. Does the RMI believe it has a complete accounting of waste stored in crypts on Enewetak Atoll, including quantity, composition, locations, and date of disposal?

Answer. The RMI has received no information from the U.S. Government regarding waste stored in crypts.

¹ https://www.dtra.mil/Portals/61/Documents/NTPR/1981-DNA_The%20Radiological%20Cleanup%20of%20Enewetak%20Atoll-web.pdf.

² https://www.dtra.mil/Portals/61/Documents/NTPR/2-Hist_Rpt_Atm/1958_DNA_6038F.pdf (p. 221 [p. 227 of the PDF page counter]).

1c. Has the U.S. Government conducted any testing of the lagoon at Enewetak to determine whether waste in the lagoon poses a threat to environmental or human health. If so, when was the last test, and are the findings publicly available?

Answer. We are not aware of any tests of the Enewetak lagoon waters to determine whether the waste dumped there, or the fallout deposited there from the nuclear tests, poses any threat to the environment or human health.

1d. Has the U.S. Government conducted any testing of the drinking water on Enewetak Island to determine whether it is safe? If so, when was the last test, and are findings publicly available?

Answer. We are not aware of any tests by the U.S. Government to determine whether the drinking water on Enewetak Island is safe.

Question 2. According to the U.S. Government, the radioactive waste dumped into Enewetak's lagoon was less radioactive than the waste buried under Runit Dome. However, there are reports from U.S. military personnel and civilians who participated in the radiological cleanup of Enewetak Atoll that some highly radioactive waste, which should have been buried under Runit Dome per stated policy, was in fact dumped into the lagoon. Is the RMI aware of an investigation by the U.S. Government into dumping of highly radioactive waste in the Enewetak Lagoon? If so, have the findings of this study been shared with the RMI?

Answer. We are not aware of any investigation by the U.S. Government of reports that highly radioactive waste was improperly dumped into Enewetak's lagoon.

Question 3. In addition to atomic and thermonuclear tests, the U.S. engaged in other military activities on Enewetak Atoll that may would have caused environmental damage. For example, the U.S. used Enewetak Atoll as a base for tests of chemical and biological warfare agents as part of Project SHAD, which ran from 1962 to 1973.

3a. Does the RMI believe it has a complete accounting of the date, location, and nature, of chemical or biological weapons tests conducted in the Marshall Islands?

Answer. The RMI does not have an accounting of the tests of chemical and biological warfare agents that were reportedly conducted in the Marshall Islands.

3b. Does the RMI believe there are any current environmental or human health risks as a result of Project SHAD, or other chemical or biological weapons tests?

Answer. The RMI does not have any information regarding Project SHAD or any other chemical or biological weapons tests that may have been conducted in the Marshall Islands. We are, therefore, not in a position to evaluate whether any current environmental or human health risks arise from such tests.

3c. Has the U.S. provided the RMI with any information about potential environmental or human health hazards as a result of Project SHAD tests?

Answer. The RMI has received no information from the U.S. Government about potential environmental or human health hazards as a result of Project SHAD tests.

Question 4. In 1968, the U.S. conducted a failed rocket test that spilled 300 pounds of highly toxic beryllium over Enjebi Island, Enewetak Atoll. The U.S. claims that the environmental and health threats caused by this beryllium were addressed by scraping surface dirt from the affected area and burying it in a crater. However, over the course of the radiological cleanup of Enewetak Atoll, starting in 1977, tens of thousands of additional cubic yards of soil was dug up and removed from Enjebi Island.

4a. Has the U.S. Government informed the RMI whether the subsequent radiological cleanup activities resulted in the resuspension of beryllium?

Answer. The U.S. Government has not informed the RMI whether the subsequent radiological cleanup activities resulted in the resuspension of beryllium. The U.S. Government's efforts to clean up the contaminated area by scraping surface dirt and burying it are described in The Radiological Cleanup of Enewetak Atoll, pp. 59-61 and 339-341. That report, however, also describes the extensive soil digging and removal activities that occurred on Enjebi Island a few years later (pp. 341-346). It appears that the subsequent activities were focused on removing radioactive material and that the potential for resuspending beryllium may not have been considered.

Also, it is disclosed on p. 59 of the report that 2,500 lbs. of propellant was scattered during the failed rocket test, of which 300 lbs. was beryllium. The RMI has not been informed of whether the remaining 2,200 lbs. of propellant also posed environmental or health risks.

4b. Has the U.S. Government informed the RMI whether any of the soil dug up and/or removed during the radiological cleanup was contaminated with beryllium? If so, has the U.S. Government informed the RMI where and how that contaminated soil was disposed?

Answer. The U.S. Government has not informed the RMI whether any of the soil dug up and/or removed during the radiological cleanup was contaminated with beryllium.

Our concern is that the criteria for determining whether waste would be buried under Runit Dome, dumped in the lagoon, or left in place related solely to radiation levels. We are, therefore, concerned that waste was not being screened for other toxins, including beryllium, and that waste contaminated with such toxins may have been dumped in the lagoon or left in place.

4c. Has the U.S. Government informed the RMI whether it has done any testing to determine whether any environmental or health risks exist from the presence of beryllium or other toxic substances on Enewetak Atoll or in the waters surrounding it, including the lagoon?

Answer. We are not aware of any testing done by the U.S. Government to determine whether any environmental or health risks exist from the presence of beryllium or other toxic substances on Enewetak Atoll or in the waters surrounding it, including the lagoon.

Question 5. The Insular Areas Act of 2011 (Public Law 112-149) directs the Department of Energy to conduct no less than every 4 years "(I) a visual study of the concrete exterior of the Cactus Crater containment structure on Runit Island; and (II) a radiochemical analysis of the groundwater surrounding and in the Cactus Crater containment structure on Runit Island." The Secretary was also directed to submit to Congress a report describing the results of each visual survey and the radiochemical analysis and "a determination on whether the surveys and analyses indicate any significant change in the health risks to the people of Enewetak from the contaminants within the Cactus Crater containment structure."

5a. Since 2012, how many inspections has the U.S. completed of the Runit Dome?

Answer. There has only been one visual study of the exterior of Runit Dome published since 2012. It was published in 2013. (Hamilton, A Visual Description of the Concrete Exterior of the Cactus Crater Containment Structure. Lawrence Livermore National Laboratory, October 2013).³

5b. Since 2012, how many radiochemical analyses of groundwater has the U.S. completed in the vicinity of Runit Dome?

Answer. The U.S. Government has not completed any of the radiochemical analyses required by the Insular Areas Act of 2011, notwithstanding the statute's requirement to conduct such an analysis at least every 4 years starting on January 1, 2012.

5c. Since 2012, how many reports has the Department of Energy delivered to Congress pursuant to this section of P.L. 112-149? Are these reports available to the RMI government or its citizens?

Answer. A Visual Description of the Concrete Exterior of the Cactus Crater Containment Structure from 2013, is the only study published pursuant to P.L. 112-149. The study is available online and has been discussed with leaders of the Enewetak/Ujelang Local Government.

5d. What steps has the U.S. taken to build RMI capacity to independently monitor environmental or health risks related to former U.S. weapons testing programs?

Answer. The U.S. has not taken any steps to build RMI's capacity to independently monitor environmental or health risks, other than scholarships for one or two students to work in the Livermore Lab.

There is no audit of the health or environmental programs to consider whether they reflect best practices in terms of radiological health and safety, particularly for elders.

³https://marshallislands.llnl.gov/cc/Hamilton_LLNL-TR-648143_final.pdf.

It is difficult for the RMI to independently monitor environmental or health impacts when all of our cancer patients have to leave the RMI because there is no cancer care in the RMI, and because DOE's laboratory employs and supports people in Livermore, CA, not in the RMI.

5e. Is the RMI able to conduct independent analysis of samples collected by the U.S. pursuant to statute?

Answer. No, the RMI is not able to conduct independent analysis of samples, and there has been no training of Marshallese in the academic disciplines to support this work. Nor is the data turned over, shared with, or owned by the RMI.

Question 6. Pursuant to Section 364 of Public Law 116-92, National Defense Authorization Act for Fiscal Year 2020, the Department of Energy was required to provide a plan to repair the Runit Dome, evaluate how the rising sea levels could affect its infrastructure, as well as its effects on the lagoon for the next 20 years. In response, the DOE submitted a report last year to Congress assessing the risks of the Runit Dome on the Marshall Islands.

6a. Has the U.S. facilitated any community events to share the findings of this study with the RMI community?

Answer. Prior to COVID-19, there were semi-annual or occasional meetings, but DOE has not conducted a meeting since the pandemic began, although a meeting could be conducted virtually.

In this regard, though, I must note that our national government is not always informed when DOE officials are in the RMI.

6b. Are there recordings of events or briefings by U.S. officials, either conducted as part of the study or to report its findings, available online to the Marshallese public?

Answer. There are not recordings or explanations that have been made available to the Marshallese people.

On this point, however, I must reiterate that RMI does not agree with the findings in the DOE's 2020 Runit Dome report.

6c. Has the U.S. translated this report into Marshallese, so it is accessible to the Marshallese speaking citizens?

Answer. No, the report has not been translated by the U.S. Government, although community members requested a translation.

In this regard, I note that, with the exception of a report in 1978, there are no DOE reports that have been translated into Marshallese. The practice by DOE is to publish findings and, then, report the findings to the RMI. Neither the academic journals nor the U.S. sharing of information are accessible to the Marshall Islands.

6d. Is the RMI able to conduct independent analysis of samples collected by the U.S. pursuant to statute?

Answer. No, the RMI is not able to conduct independent analysis of samples collected by the U.S.

The RMI would like to see DOE hire Marshallese scientists and professionals from our institutions, such as our EPA, the Marshall Islands Marine Resources Authority, or the College of the Marshall Islands.

6e. What does the RMI believe are steps the U.S. should take to ensure that the Marshallese have sufficient access to information about the U.S. weapons testing programs in the Marshall Islands?

Answer. To ensure a strong foundation for the U.S.-RMI relationship, it is very important to disclose all information and be open with new information and details shared by Enewetak clean-up veterans.

There should also be a bilateral agreement on steps toward sufficient access to information regarding the testing.

In addition, there should be a discussion of the synergistic impacts of nuclear, chemical, and biological tests, so that RMI leaders understand the cumulative and intersecting impacts.

The RMI still has no fallout information for some of the nuclear weapons tests. We also still do not understand the full extent of radiological and other hazards our people face. This information should be provided.

There can be no closure without disclosure.

Questions Submitted by Representative DeGette

Background

Rep. DeGette's Clean Energy Innovation and Deployment Act includes a provision (Section 130 of H.R. 7516 in the 116th Congress) that may be of great benefit to people living in U.S. territories, as well as on islands and in remote areas worldwide.

The provision would require the Department of Energy (DOE) to establish a certification program for electricity-related technologies for use in remote communities. Companies whose products were certified could use that fact in marketing the technologies, much as do the recipients of DOE's Energy Star label. Facilitating the deployment of these technologies would make modern electricity services more affordable, reliable, and resilient to households in remote areas, and reduce demand for expensive imported fossil fuel-generated electricity and the associated carbon emissions.

Qualifying technologies would include those that can generate electricity off-grid (such as solar panels), those that store energy, and highly efficient appliances, including lights, cell-phone chargers, computers, fans, refrigerators, stoves and ovens. DOE would only certify a technology determined to function properly; generate no greenhouse gas emissions; be affordable, reliable, durable, safe, and protective of human health and the environment; be compatible with other technologies relevant to its functioning, including those which have been similarly certified; and be available for deployment at commercial-scale throughout the territories and states of the United States.

There is already a market for these kinds of technologies, especially in developing countries, but many of the products being marketed today do not work well, are sold on the basis of fraudulent claims, or are not compatible with adjacent technologies (for example, a solar panel not being compatible with a battery). Rep. DeGette's measure would make DOE the validator of these technologies, thus driving their innovation, increasing their quality, protecting consumers in the United States and globally, and facilitating the deployment of affordable reliable resilient climate-friendly technologies to communities in the United States, and around the world, that need them the most.

Question 1. In addition to being on the front lines of climate change, are communities on your islands paying much higher electricity rates due to the fact that most electricity is generated from imported, expensive, and, in many cases, polluting fossil fuels?

Answer. Yes. Approximately 98% of all electricity generated is from imported fossil fuels. The current retail rate for gasoline and diesel on the capital island of Majuro is between \$5.00 and \$5.50 per gallon for gasoline and \$4.50 to \$4.80 per gallon for diesel. In the remote outer island communities, fuel can range from \$10.00-\$12.00 per gallon.

The RMI introduced individual solar home systems to every household in the outer islands more than 10 years ago, which has greatly reduced the shipments of kerosene for use in lanterns and kerosene stoves. Coupled with the introduction of gas stoves and smokeless oven programs, respiratory health ailments have reduced over recent years among the outer island population. Fuel quality has been greatly improved with the upgrade to ultra-low sulfur fuel products in recent years. Though these efforts are small, they form the start of the transition to renewable energy reforms and goals.

Question 2. Are the electric grids on your islands vulnerable to disruption by the effects of climate change, in particular increasing storm intensity, water cycle disruption, average temperatures, and sea level rise?

Answer. Yes. With the natural ground levels on all the islands only being 1 foot higher than the mean high-water level, all weather influences affect every aspect of life in the Marshall Islands. More than 70% of our systems are installed underground and are increasingly subject to tidal and stormwater flooding of cable pits and ducts. Programs are being developed to raise all cable splices and joints to elevated junction boxes. Power transformers, isolating and protection equipment are being raised to an elevated level to climate-proof the equipment in anticipation of future events. Long periods of dry, windy weather have increased the incidents of pole fires due to salt buildup on pole-top connections when light rain showers appear and are not heavy enough to quickly wash away the buildup of the salts. Implementing climate proof methods to the electric grids is a vital task as we face the challenge of converting our 1970s power grid into a renewable energy compliant power grid for the future.

Question 3. Do you believe this puts an additional and unnecessary financial strain on those living on your islands?

Answer. Yes. The transition period for the conversion of the existing grids both in the urban centers and the remote outer islands to climate-proof grids will take many years because they are our only functioning electric grids. The RMI does not have inter-connectivity with other grids to supplement power generation issues. Restrictive land areas and high costs make it difficult to construct bypass networks. For the next 10 years, the RMI will continue to face system and component failures as upgrade projects are funded and progressively implemented.

Question 4. Given that, do you think there might be a market on your islands for affordable reliable resilient equipment to generate and use zero-emitting electricity, reducing dependence on expensive fossil fuels and the vulnerable electric grid?

Answer. Yes. We continuously seek assistance from all partners to implement new energy sources and upgrade existing ones. Development plans are continually being developed on a project-by-project basis in an attempt to follow the nationally approved path outlined in the RMI Electricity Roadmap. This is available at the website www.rmienergyfuture.org which contains the full roadmap and additional educational tools as well as reference tools and technical papers for key elements to achieve the goals.

Question 5. Do you think certification of this kind of equipment by the U.S. Department of Energy, as described in the Background section, would increase consumer confidence in it and thereby promote its use on your islands?

Answer. Yes. People are more quality conscious today amid the vast variety of products available in the market today.

Questions Submitted by Representative Graves

Question 1. I am concerned that the creation of new Federal programs may result in duplication with existing programs, diluting funding availability and potential impacts. Are existing programs failing to meet these needs? If so, could they be reformed to better support current inadequacies? Please provide specific examples.

Answer. One big issue is the need for a transition period to renewables. Many programs only allow for 100% renewable product expenditures. There are key areas where assistance is initially needed to convert non-compatible energy grids to being able to work with intermittent renewable energy systems. Our island grids are of such a small capacity that installing a five-megawatt solar system can provide 50% of our daytime energy demand but it may be 400% more than the capacity of the distribution lines where the solar system is located. Additionally, the intermittent production from the solar system greatly affects the stability of the existing fossil fuel generation systems to the point where the solar system has to be shut down or curtailed until upgrade works can be funded. Another area is that of system efficiency and loss reductions. Many older systems can have system losses of more than 30% which can relate to millions of dollars in wasted fuel consumption, but it is difficult to get assistance to reduce these losses as the work does not relate to increasing renewable percentages.

Question 2. Insular areas are unique in many ways, including energy. These areas are largely dependent on imports for energy—resulting in high costs, reduced energy security and vulnerability to supply chain disruption. Distributed generation and renewables are a very good fit for the natural resource availability of many of these areas. However, my concern is that the Federal Government would be mandating a singular approach. Even if you were to dramatically increase renewables, does it make sense to keep the door open for other energy options?

Answer. Definitely. The RMI is constantly looking to different forms of energy production that can improve the quality of life and the economic opportunities for our citizens. We acknowledge and promote the need for a long transition period to achieve 100% renewable energy production and to provide energy security. The RMI has to maintain fossil fuel energy production and fuel storage systems for most of this transition period due to the increasing and unpredictable events associated with climate change because of our isolated location. In the event of a disaster, the RMI cannot source power from a neighboring state as can be done in the U.S. Currently, the RMI is engaged in wind and solar assessment programs. Waste to energy systems are under review as well as various recycling programs, such as those returning plastics to oils. The RMI is approached about opportunities to work with various systems, many unproven, but many do not take into consideration the

scale of operations, the geology and topography of the islands, the remoteness and practicality of living in island nations. So many systems are impractical for use, at present.

Question 3. A primary reason for a government mandates is that a desired outcome does not make financial sense over the long term. Is that the case—would renewable energy be more expensive over the long term? If not, what is the benefit of having the Federal Government impose such mandates (if it potentially ties the hands of these areas should a better option come along in the future)?

Answer. Luckily, that is not the case yet. There is always a desire to fast-track ideas, such as allowing anyone to inject energy into the local grids from personal solar or wind systems for example. If the existing power grid is small and not set up to cope with lots of uncontrollable intermittent energy, however, it will repeatedly fail due to stability issues. In the RMI, we currently do not allow individuals to connect private energy systems to the grids. We are installing large solar systems, but these will be controlled by the utility directly, allowing it to turn them on and off as needed. The application rules for island power systems, with one generation facility (a diesel power plant), are totally different to that of an island or a State in the U.S. that has a power grid with dozens or thousands of generation facilities that can absorb fluctuations. So, any mandate has to consider the variety and complexity of existing power grids.

The CHAIRMAN. Thank you, Mr. Ambassador, for your comments. And let me now jump to Mr. Jean-Pierre Oriol, Commissioner of USVI Department of Planning and Natural Resources.

Sir, the time is yours.

STATEMENT OF JEAN-PIERRE L. ORIOL, COMMISSIONER, U.S. VIRGIN ISLANDS DEPARTMENT OF PLANNING AND NATURAL RESOURCES, ST. THOMAS, VIRGIN ISLANDS

Mr. ORIOL. Thank you. Beginning, I would like to start off by saying I bid you talofa, buenos dias, hafa adai, and good afternoon by all the insular area family, Representative Grijalva. Thank you for the opportunities to testify in support of the proposed Insular Area Climate Change Act on behalf of the U.S. Virgin Islands.

Whether it is the 2015 federally declared disaster for drought in the U.S. Caribbean, the impact of Hurricanes Irma and Maria on Puerto Rico and the U.S. Virgin Islands in 2017, or Tropical Cyclone Gita in American Samoa, or Super Typhoon Yutu in the Mariana Islands in 2018, the people of the Virgin Islands and the insular areas and territories of the United States are no strangers to damaging events associated with climate change.

Our islands make minimal contributions to greenhouse gas emissions, yet they are experiencing overwhelming ecological, economic, and cultural impacts from global climate change, which will dramatically increase over the next several decades.

The combined effects of sea-level rise, ocean acidification, increased storm intensity and frequency, and significant changes in rainfall, coral bleaching, and temperature-induced changes in the distribution of ocean productivity and fisheries are of great concern to all of the insular areas and require addressing infrastructure improvements as well as sustainability and climate change adaptation planning.

Addressing climate change in an effective and timely manner is one of the most pressing challenges, where sound environmental policy is also the best economic policy and addresses key quality-of-life issues for present and future generations.

For the U.S. Virgin Islands, as we recover from the devastation suffered from two Category 5 hurricanes, we are focused on incorporating long-term resilience into our everyday way of life. The U.S. Virgin Islands is involved in several initiatives related to assessing the impacts from climate change in our territory.

In conjunction with the University of the Virgin Islands and using funding from NOAA's Office for Coastal Management, the VI's Coastal Zone Management Program is developing a coastal vulnerability index that will identify our susceptibility to different climate-related events, such as sea-level rise, tsunamis, storm surge, drought, coastal flooding, and coastal erosion.

The Department of the Interior's Office of Insular Affairs has provided funding to the territory through its Coral Reef Initiative to install ocean acidification monitors at our long-term monitoring sites and has also provided funding to the territory for a 50-kilowatt microgrid at one of our hurricane shelter sites.

The U.S. Department of Energy is partnering on many initiatives with the Virgin Islands Division of Energy, including an energy rebate program, our sun power grant program, and providing technical assistance with our comprehensive energy strategy.

The government of the Virgin Islands is receiving support from FEMA's Hazard Mitigation Program for the updating of our Hazard Mitigation Resilience Plan, which identifies threats across all sectors and strategies to be implemented as part of our long-term resilience.

Lastly, but not exhaustive, I would also like to recognize the support given to us by the Department of Housing and Urban Development, who is administering the Community Development Block Grant Disaster Recovery funding to the U.S. Virgin Islands, which has a mandate that the U.S. Virgin Islands relate the activities in the third tranche of funds to the Hazard Mitigation Resilience Plan.

The proposed bill provides five sections directing the actions of our Federal partners and assisting the insular areas and territories with planning and implementation of climate resilience activities. The U.S. Virgin Islands is supportive of all the directives in Titles II through VI. And, overall, the Virgin Islands sees the significance of this bill and the proposed creation of programs and steady funding sources specifically for the insular areas and territories to address impacts related to climate change.

We applaud the bill's sponsor for the language included in Title I, Section 101(c)(1) and (c)(2) related to the equitable baseline funding. Many baseline formulas for assistance under Federal programs use land mass or population—

[Audio malfunction.]

The CHAIRMAN. We lost the audio on that.

Ms. LOCKE. I believe he has connectivity issues.

The CHAIRMAN. OK. We can return to finish that part of the testimony.

We will now move to Secretary Machargo Maldonado, Secretary of Natural and Environmental Resources, Puerto Rico, for his comments. And then we will return to Mr. Oriol for him to finish his comments as soon as the technical issues are dealt with.

Mr. Secretary, the time is yours, sir.

**STATEMENT OF RAFAEL A. MACHARGO MALDONADO,
SECRETARY, PUERTO RICO DEPARTMENT OF NATURAL AND
ENVIRONMENTAL RESOURCES, SAN JUAN, PUERTO RICO**

Mr. MACHARGO. Good afternoon, Chairman Grijalva, Ranking Member Westerman, Resident Commissioner González-Colón, and Committee members. Thank you for the opportunity to appear before you today to discuss the draft of the Insular Area Climate Change Act.

My name is Rafael Machargo. I am the Secretary of the Department of Natural and Environmental Resources of Puerto Rico. Also, I am the Chairman of the Puerto Rico Climate Change Expert and Advisory Committee.

Created under Puerto Rico Act No. 33 of 2019, the committee's primary duty is to advise on the implementation of Puerto Rico's public policy on climate change and prepare the "Plan for the Mitigation, Adaptation, and Resilience of Climate Change of Puerto Rico." The committee is the official government organization for all climate change matters in Puerto Rico.

The committee, which I am honored to chair is comprised of nine members—three of them *ex officio* and six scientific and academic members and experts—appointed by the governor and confirmed by the legislature. The permanent members are as follows: (1) Engineer Carl Alex Soderberg, former Director of the Caribbean Division of the American Environmental Protection Agency. He is our water expert. (2) Meteorologist Ada Monzón. She already testified. She is our meteorologist. (3) Climatologist Rafael Mendez Tejeda. He is also at the University of Puerto Rico Carolina campus. (4) Global renewable energy expert Mr. Roy Charles Torbert. He is the director of the Rocky Mountain Institute. (5) The expert in climate change and public health, Dr. Pablo Mendez Lazaro. He works at the University of Puerto Rico, Medical Sciences Department. And, finally, (6) coastal oceanographer Dr. Maritza Barreto. She is the Chair of Coastal Research and Planning Institute of Puerto Rico and member of the American Shore and Beach Association Board of Directors.

The government's representatives are the secretary of economic development and commerce, the president of the University of Puerto Rico, and the secretary of natural and environmental resources.

In the past few years, Puerto Rico has experienced the effects of severe weather. On September 20, 2017, Hurricane Maria, a powerful hurricane with sustained winds of over 150 miles per hour, made direct landfall and bisected the entire island of Puerto Rico.

Hurricane Maria caused widespread destruction and left flooding associated with over 40 inches of rainfall; major devastation of residential areas, roads, bridges, communication towers; and total failure of the electric grid infrastructure caused by the collapse of thousands of power lines and poles.

Furthermore, the storm activated thousands of landslides registered in high-altitude and steep-sloped topographic areas, including the central region, or La Cordillera Central region.

NOAA's National Center for Environmental Information and the National Hurricane Center jointly classified Hurricane Maria as

the United States' third-costliest tropical cyclone. Damage in Puerto Rico and the U.S. Virgin Islands totaled over \$90 billion.

Climate change needs to be addressed urgently. For that matter, we strongly support Chairman Grijalva's proposed intention to move forward with the climate change issues in the U.S. territories and Freely Associated States. Although the Committee on Climate Change in Puerto Rico will be submitting more specific comments on the newest draft version of the bill, our main recommendations are as follows.

Title III—We recommend to appropriate the funds to acquire an additional NEXRAD Doppler system. Given the catastrophic nature of tropical cyclones resulting from climate change, an additional NEXRAD Doppler system must be incorporated into the islands' regime.

Also, we recommend the re-evaluation of the allocation amounts to be appropriated by Congress for the different programs.

We would recommend to add a section on Title V to include the following:

"Technical assistance. The Environmental Protection Agency will provide technical assistance to territories and Freely Associated States on adaptation and resilience to climate change impacts on water supply. The technical assistance will include, but will not be limited to, implementation of EPA's WaterSense water conservation program, wastewater reuse, rainfall harvesting, and reduction of potable water loss in the distribution system, protection of aquifer recharge areas, erosion control, among others."

We also are recommending Title III, Section 302, to include technical assistance on coastal erosion of flooding.

I also would recommend a new section for "Mitigation, Adaptation, and Resiliency Climate Change Plan":

"(A) One year after the enactment of this law, each territory shall submit a climate change mitigation, adaptation, and resiliency plan.

"(B) Grants—FEMA will provide each territory up to \$1,000,000 to develop a comprehensive climate change mitigation, adaptation, and resiliency plan. The plan will be submitted to the Federal task force for approval. Once approved, each territory will implement it according to the timetables included in the document. Federal grants to implement mitigation, adaptation, and resiliency projects will be contingent on the approved plans."

Once again, we want to thank this honorable Committee for the opportunity to present these preliminary comments and recommendations on the proposed bill, as further commentaries will be submitted at the proper time. The Committee on Climate Change hopes you to find this useful and reiterates its commitment to supporting the initiatives to address climate change.

Thank you.

[The prepared statement of Mr. Machargo follows:]

PREPARED STATEMENT OF THE HON. RAFAEL MACHARGO, SECRETARY, PUERTO RICO
DEPARTMENT OF NATURAL AND ENVIRONMENTAL RESOURCES

Chairman Grijalva, Ranking Member Westerman, and Committee Members: Thank you for the opportunity to appear before you today to discuss the draft of the Insular Area Climate Change Act. My name is Rafael Machargo. I am the Secretary of the Department of Natural and Environmental Resources of Puerto

Rico and President of the Puerto Rico Climate Change Experts and Advisory Committee (CEACC, by its Spanish acronym).

Created under Puerto Rico Act No. 33–2019 (Act 33), the CEACC’s primary duty is to advise on the implementation of Puerto Rico’s public policy on climate change and prepare the “*Plan for the Mitigation, Adaptation, and Resilience on Climate Change of Puerto Rico.*” The CEACC is the official governmental organization for all climate change matters.

The CEACC, which I’m honored to preside, comprises nine members: three of them *ex officio* and six scientific and academic permanent experts, appointed by the Governor of Puerto Rico and confirmed by the Legislative Assembly. The permanent members are the following: Eng. Carl Alex Soderberg (former Director, Caribbean Division of the Environmental Protection Agency); meteorologist Ada Monzón (CEO of *Eco Exploratorio of Puerto Rico* and news communicator); climatologist Dr. Rafael Méndez Tejeda (Scientist and Dean of the University of Puerto Rico, Carolina campus); global renewable energy expert, Mr. Roy Charles Torbert (Director of Rocky Mountain Institute); expert in climate and public health, Dr. Pablo Méndez Lázaro (Scientist at the University of Puerto Rico, Medical Sciences Department); and coastal oceanographer Dr. Maritza Barreto (Chair Coastal Research and Planning Institute of Puerto Rico and member of the American Shore and Beach Association Board of Directors). The Government’s representatives are the Secretary of the Department of Economic Development and Commerce of Puerto Rico (DDEC), the President of the University of Puerto Rico, and the Department of Natural and Environmental Resources of Puerto Rico.

In the past few years, Puerto Rico has experienced the effects of severe weather. On September 20, 2017, Hurricane María, a powerful hurricane with sustained winds over 150 MPH, made direct landfall and bisected the entire Island. María caused widespread destruction and left flooding associated with over 40 inches of rainfall, major devastation of residential areas, roads, bridges, communication towers, and total failure of the electric grid infrastructure caused by the collapse of thousands of power lines and poles. Furthermore, the storm activated thousands of landslides registered in high altitude and steep-sloped topographic areas, including the central cordillera region. NOAA’s National Centers for Environmental Information and the National Hurricane Center jointly classified Hurricane María as the United States’ third-costliest tropical cyclone. Damage in Puerto Rico and the U.S. Virgin Islands totaled \$90 billion.

Climate change needs to be addressed urgently. For that matter, we strongly support Chairman Grijalva’s proposed intentions to move forward with climate change issues on the U.S. Territories and the Freely Associate States. Although the CEACC will be submitting more specific comments on the newest draft version of the bill, our main recommendations are as follows:

- Title III: We recommend to appropriate funds to acquire an additional NEXRAD Doppler system. Given the catastrophic nature of tropical cyclones resulting from climate change, an additional NEXRAD Doppler system must be incorporated into the Islands’ regime.
- Reevaluate the allocations amounts to be appropriated by Congress for the different programs.
- Add a section on Title V to include the following:

TECHNICAL ASSISTANCE

The Environmental Protection Agency will provide technical assistance to the Territories and the Free Associated States on adaptation and resilience to Climate Change impacts on water supply. The technical assistance will include, but will not be limited to, implementation of EPA’s WaterSense water conservation program, wastewater reuse, rainfall harvesting, and reduction of portable water loss in the distribution system, protection of aquifer recharge areas, erosion control, among others.”

- Title III, Section 302: The CEACC recommends including technical assistance on coastal erosion and flooding.
- Add a new Section for:

MITIGATION, ADAPTATION, AND RESILIENCE CLIMATE CHANGE PLAN

(a) One year after the enactment of this law, each Territory shall submit a Climate Change Mitigation, Adaptation, and Resilience Plan

(b) *Grants—FEMA will provide each Territory up to \$1,000,000 to develop a comprehensive Climate Change Mitigation, Adaptation and Resilience Plan. The Plan will be submitted to the federal Task Force for approval. Once approved, each Territory will implement it according to the timetables included in the document. Federal grants to implement mitigation, adaptation, and resilience projects will be contingent on the approved plans.*

Once again, we want to thank this Honorable Commission for the opportunity to present these preliminary comments and recommendations on the proposed bill, as further commentaries will be submitted in the proper time. The CEACC hopes that you find these useful and reiterate its commitment to support initiatives to address climate change,

Thank you.

QUESTIONS SUBMITTED FOR THE RECORD TO MR. RAFAEL A. MACHARGO MALDONADO,
SECRETARY, PUERTO RICO DEPARTMENT OF NATURAL RESOURCES

Thank you for your interest in the effect of climate change in Puerto Rico and the alternatives to address those issues.

In compliance with the Committee's request for information, we submit Puerto Rico Climate Change Experts and Advisory Committee (CEACC, by its Spanish acronym) and Puerto Rico Department of Natural and Environmental Resources commentaries, specifically referencing the questions submitted by each Member.

The CEACC and the DNER hope that you find these comments useful. If you require additional information, please contact Carmen M. Feliciano, Executive Director of the Puerto Rico Federal Affairs Administration.

Questions Submitted by Representative DeGette

Background

Rep. DeGette's Clean Energy Innovation and Deployment Act includes a provision (Section 130 of H.R. 7516 in the 116th Congress) that may be of great benefit to people living in U.S. territories, as well as on islands and in remote areas worldwide.

The provision would require the Department of Energy (DOE) to establish a certification program for electricity-related technologies for use in remote communities. Companies whose products were certified could use that fact in marketing the technologies, much as do the recipients of DOE's Energy Star label. Facilitating the deployment of these technologies would make modern electricity services more affordable, reliable, and resilient to households in remote areas, and reduce demand for expensive imported fossil fuel-generated electricity and the associated carbon emissions.

Qualifying technologies would include those that can generate electricity off-grid (such as solar panels), those that store energy, and highly efficient appliances, including lights, cell-phone chargers, computers, fans, refrigerators, stoves and ovens. DOE would only certify a technology determined to function properly; generate no greenhouse gas emissions; be affordable, reliable, durable, safe, and protective of human health and the environment; be compatible with other technologies relevant to its functioning, including those which have been similarly certified; and be available for deployment at commercial-scale throughout the territories and states of the United States.

There is already a market for these kinds of technologies, especially in developing countries, but many of the products being marketed today do not work well, are sold on the basis of fraudulent claims, or are not compatible with adjacent technologies (for example, a solar panel not being compatible with a battery). Rep. DeGette's measure would make DOE the validator of these technologies, thus driving their innovation, increasing their quality, protecting consumers in the United States and globally, and facilitating the deployment of affordable reliable resilient climate-friendly technologies to communities in the United States, and around the world, that need them the most.

Question 1. In addition to being on the front lines of climate change, are communities on your islands paying much higher electricity rates due to the fact that most electricity is generated from imported, expensive, and, in many cases, polluting fossil fuels?

Answer. Puerto Rico's grid is supplied by a portfolio of energy sources from which only less than 3 percent came from renewables. About 97 percent of the energy is produced using multiple fossil fuels. The high dependence on the import of fossil fuels impacts energy rates drastically, also creating instability on the rates subject to world market changes.

In other words, Puerto Rican communities pay approximately double the U.S. average for electricity and experience almost 10 times as many power outages as the average American customer (per the Department of Energy). Currently, Puerto Rico imports all fossil fuels used on the Island. Approximately 97 percent of all power comes from fossil fuels (a mix of coal, methane imported in liquefied natural gas, heavy fuel oil, and diesel).

The generation in Puerto Rico occurs in a mix of antiquated generators owned by PREPA, a private coal plant owned and operated by AES Corporation, and a liquefied natural gas import and generation facility owned and operated by *EcoElectrica*. Two private providers generate wind power, and five generate solar power on Island. The hydropower resources on the Island require significant attention to be rehabilitated and can be a valuable resource. Also, thousands of Puerto Rican families and businesses provide rooftop solar and have installed batteries. The long-term utility grid plan approved by the Puerto Rico Energy Bureau calls for a large-scale expansion of new renewable and battery storage resources, along with new energy efficiency programs, to reduce costs and meet the public policy requirements on the pathway to 100 percent renewable energy (as specified in Law 17-2019).

Given the few and antiquate generations on the Island, Puerto Rico is exposed to both the fluctuations of the world oil market and the risks of an outage to a major generation facility. In early 2020, a series of devastating earthquakes disrupted communities in the south of Puerto Rico and damaged the largest PREPA-owned generator at Costa Sur. The outage forced other generators to manage daily generation, and without the severe decrease in power demand due to the COVID-19 global pandemic, it could have significantly increased costs and impaired service for Puerto Ricans.

Furthermore, Puerto Rico has repeatedly suffered from environmental degradation due to fossil fuel usage and improper disposal of toxic waste (including coal ash). The EPA has conducted a study of all power plants in the United States concerning compliance with Mercury and Air Toxics Standards (MATS), and the only facilities resulting in a community cancer risk at or above 1-in-1 million are in Puerto Rico (using the methodology established by the EPA's independent Science Advisory Board).

When the largely fossil-dominated and antiquated generation is combined with a fragile grid in need of modernization and improved maintenance practices—Puerto Rico faces an expensive and polluting system. These costs are currently borne by communities largely disadvantaged socio-economically, and further investments in a fossil-dominated system could risk imposing additional decades of cost and negative health outcomes.

Question 2. Are the electric grids on your islands vulnerable to disruption by the effects of climate change, in particular increasing storm intensity, water cycle disruption, average temperatures, and sea level rise?

Answer. The Puerto Rican energy grid is at a high risk of disruption due to climate change, with the most pressing threat due to hurricanes. While no single storm can be attributed to climate change, a growing body of literature finds the odds of extreme storms, including their frequency and duration, exacerbated by the increase in average sea temperatures. The most recent hurricane event occurred in 2017, with Hurricane Irma's impacts and, most damagingly, Hurricane María.

Following the 2017 hurricane season, the average customer lacked power for 7 months, and not until after 11 months had passed PREPA was able to reconnect all customers. These outages were deadly and highly disruptive to community activity. The lack of power crippled water infrastructure and impaired critical healthcare services such as emergency operations and dialysis.

The largest risk and greatest disruption occurs in the transmission and distribution systems, consisting of 2,478 miles of transmission lines, 31,485 miles of distribution lines, and 344 sub-stations, per the Build Back Better report. Failures in these systems can be widespread and typically leave remote communities in the mountainous center of Puerto Rico and Vieques and Culebra's islands, without power for an extended period of time. The risk occurs due to limitations on vegetation management (leaving many power lines at risk of falling limbs), underinvestment in key facilities and substations, and a system design with much of the high voltage transmission running through mountainous terrain with limited road access.

Many of the substations and all fossil-fueled generation facilities are located on the coast and are vulnerable to sea-level rise and flooding. Furthermore, increased temperatures create additional strain in electrical equipment.

Question 3. Do you believe this puts an additional and unnecessary financial strain on those living on your islands?

Answer. Per recent Census data, 45 percent of Puerto Ricans live below the poverty line. Extreme events such as Hurricane Maria were disproportionately deadly due to the weak infrastructure and the fragile state of the power grid. The ongoing financial crisis and prolonged recession have occurred in part due to key industries leaving the Island. According to the President of the Puerto Rico Manufacturers Association, reducing power costs must be the top priority to support the Island's competitiveness.

The combination of burdensome costs of power, even as the global pandemic and lockdowns make household power exceptionally critical for all—combined with declining industrial activity and employment opportunities create an extraordinary strain.

This strain is avoidable, given the increasingly competitive opportunities for renewable and battery storage options to decrease cost and improve Island communities' resilience. Examples from Saint Lucia, Hawaii, and Jamaica provide powerful examples to learn from. In Jamaica, the regulator calculated that in a decade of decreased oil fuel dependence (decreasing from 95 percent to 50 percent by 2019), system costs declined. The regulator assessed that the electricity tariff was 30 percent lower due to improved grid performance, renewable energy, and cleaner and more efficient fossil fuel usage. A similar result in Puerto Rico would significantly benefit families and communities and help improve business conditions and employment.

In Puerto Rico, energy efficiency should also be broadly pursued, and the Puerto Rico Energy Bureau has initiated proceedings to prepare such programs. An effective island-wide energy efficiency effort will reduce the total requirements for new and replacement power generation, reduce costs for individuals and the grid (as energy efficiency is routinely determined to be the cheapest source of power), and make the grid more flexible and resilient to disruptions.

Question 4. Given that, do you think there might be a market on your islands for affordable reliable resilient equipment to generate and use zero-emitting electricity, reducing dependence on expensive fossil fuels and the vulnerable electric grid?

Answer. The market has already been shifting toward clean, resilient, and reliable options. Customers have chosen to adopt rooftop solar panels coupled with batteries for resilience. The grid regulator assessed a detailed future plan (the Integrated Resource Plan) for generation options and determined the highest renewable adoption scenario for cost reduction and meeting public objectives. In December 2020, PREPA filed for the first phase of procurement in compliance with that approved plan, to seek 1,000 megawatts (MW) of solar PV or equivalent renewable energy and 500 MW of 4-hour battery storage.

When given clear direction and appropriate federal support to rebuild the grid to incorporate new clean and resilient power, this market will boost Puerto Rican employment and help reduce dependence on imports. By similarly ensuring that grid-scale procurements, federal support, and incentives such as the Investment Tax Credit can apply to customer-sited systems (distributed energy), the grid and key critical facilities can be made more resilient. In this growing market, specialized off-grid technologies can be useful and supplemental (including solar lights).

Question 5. Do you think certification of this kind of equipment by the U.S. Department of Energy, as described in the Background section, would increase consumer confidence in it and thereby promote its use on your islands?

Answer. Generally, a clear and accepted certification will help advance customer confidence. Customers in Puerto Rico had already installed many solar systems before the impact of hurricanes in 2017. Yet those systems were designed to be grid-tied (meaning they only function when the grid is operable), and many customers were unaware of this constraint. Since this event, systems with the ability to disconnect are widely prevalent (including frequent integration of batteries to integrate with the solar and serve as grid back-up for the facility). Many customers still struggle to determine whether warranties and system interconnection will be straightforward.

For efficient appliances, the DOE Energy Star is widely adopted and trusted by customers. It focuses on the energy performance of equipment, and other related certifications address reliability. Further advancement would be beneficial but

should integrate with DOE Energy Star programs to ensure this is simple and straightforward for customers.

Questions Submitted by Representative Graves

Question 1. I am concerned that the creation of new Federal programs may result in duplication with existing programs, diluting funding availability and potential impacts. Are existing programs failing to meet these needs? If so, could they be reformed to better support current inadequacies? Please provide specific examples.

Answer. Existing programs, specifically the Energy Star certification program provided by DOE, are an effective mechanism to indicate energy-efficient appliances to customers, and household surveys indicate high percentages of customers find the label influential in their purchasing decisions. These Energy Star certified appliances' performance will be functionally similar (barring any voltage fluctuations with weak grids). Continued support to further advance Energy Star's efficiency standards will help raise standards and minimize customer energy costs, particularly in insular areas.

For solar panels and batteries, certification is provided by Underwriters Laboratories (UL) and the Institute of Electrical and Electronics Engineers (IEEE), with significant safety and reliability testing. These are refined and updated frequently and are readily available. These standards are applicable for all U.S. applications and territories.

Continued support to insular areas through the National Laboratories to address customer concerns on interconnection and off-grid operation is beneficial and can be augmented. In terms of solar and battery system sizing, IEEE 1562:2007 provides clear and effective guidance.

Question 2. Insular areas are unique in many ways, including energy. These areas are largely dependent on imports for energy—resulting in high costs, reduced energy security and vulnerability to supply chain disruption. Distributed generation and renewables are a very good fit for the natural resource availability of many of these areas. However, my concern is that the Federal Government would be mandating a singular approach. Even if you were to dramatically increase renewables, does it make sense to keep the door open for other energy options?

Answer. To date, in Puerto Rico, federal entities have supported and advanced the public policy goals established by the Government of Puerto Rico. As established in Act 17 of 2019 and the approved Integrated Resource Plan established in August 2020, that pathway reduces import dependence, reduces costs, and advances renewable energy options. By 2028, the law mandates a full phase-out of the use of coal for power generation. By 2050, the law mandates that 100 percent of the Island's power will be generated by renewable energy.

Institutions in Puerto Rico, particularly the energy regulator who has overseen and now approved the Integrated Resource Plan, can work together with federal support to advance these objectives while assessing other options, including existing resources, alternatives that exist today, and future energy options not yet viable.

Acting quickly to install and integrate the renewable resources as specified by the law, and now in the procurement process by PREPA, will reduce costs for customers and help meet local objectives for a cleaner system.

Question 3. A primary reason for a government mandates is that a desired outcome does not make financial sense over the long term. Is that the case—would renewable energy be more expensive over the long term? If not, what is the benefit of having the Federal Government impose such mandates (if it potentially ties the hands of these areas should a better option come along in the future)?

Answer. Renewable energy is, in fact, the cheapest option for insular areas such as Puerto Rico. According to detailed grid analysis performed under the direction of the Puerto Rico Energy Bureau and carried out by a consultant team from Siemens using PREPA data and input, the cheapest option for all Puerto Ricans in the coming 20 years is the highest renewable energy scenario (S3S2B) assessed in the analysis. In the order titled 'Final Resolution and Order on the Puerto Rico Electric Power Authority's Integrated Resource Plan,' the regulator approved that scenario in concluding the mandated Integrated Resource Plan Process. That plan includes procurements (now underway) to bring on 6,900-gigawatt-hours (GWh) of renewable energy annually by 2025, equally 45 percent of the total grid energy. This scenario, and others assessed by the expert consultants, include energy efficiency programs to reduce total grid power demand. Those new renewables and efficient resources, including all program, financing, and installation costs, are cost-effective

when compared against running existing fossil fuels or developing new fossil fuel infrastructure.

Numerous expert witnesses and intervenors reviewed these findings. Similar findings from studies done by the University of Puerto Rico and led by Professors Efrain O'Neill Carrillo, José Colucci-Ríos, Agustín Irizarry Rivera and others, the organization *Cambio*, the Institute for Energy Economics and Financial Analysis, and many others, all find that the most cost-effective option for Puerto Rico is efficiency and clean energy.

Investing in the most cost-effective option, given all current knowledge and examples of successfully integrating renewable energy from Texas, Arizona, California, Costa Rica, Hawaii, Jamaica, Saint Lucia, and many other U.S. jurisdictions and similar islanded grids, is the clear answer for Puerto Rico.

Questions Submitted by Resident Commissioner González-Colón

Question 1. Could you briefly discuss the role of the Puerto Rico Climate Change Experts and Advisory Committee, which you preside? What are some of the initiatives the Committee plans to pursue in the near future to increase adaptation and resilience to climate change on the Island? How can Congress be of assistance?

Answer. The Committee of Experts and Advisers on Climate Change of Puerto Rico (CEACC, by its Spanish acronym) was established by Law 33–2019. The Committee is comprised of nine members. Three members are ex Officio; the Secretary of Natural and Environmental Resources, who chairs the Committee; the Secretary of Economic Development and Commerce; and the President of the University of Puerto Rico. Six members are non-governmental scientists, which had to be confirmed by the Senate and the House of Representatives of Puerto Rico. The non-governmental members serve for no less than 5 years to assure continuity of service.

The main responsibilities of the CEACC are to oversee the implementation of Puerto Rico's climate change public policy as established by law; develop the Climate Change Mitigation, Adaptation and Resilience Plan of Puerto Rico (the Plan); oversee the implementation of the Plan, and provide advice to the executive and legislative branches of the Government of Puerto Rico on matters concerning climate change. The CEACC will recommend specific adaptation measures in reforestation, tourism, agriculture, transportation, energy production and distribution, water availability, protection of coastal areas, protection of key infrastructure, among others. In addition, the CEACC is following up on Puerto Rican agencies' compliance with specific mandates established in Puerto Rico's Climate Change Act. Examples of these mandates are: (1) purchasing hybrid or electric vehicles in all agencies and municipalities; (2) planting 100,000 trees per year; (3) generate 20 percent of electricity with renewables by 2022, 40 percent by 2025, 60 percent by 2040 and 100 percent by 2050; (4) reduce electricity demand by 1 percent annually for 10 years; (5) conduct inventory of greenhouse gases; (6) mandatory use of solar-powered heaters in homes built after the law was enacted; (7) develop an inventory of green gas execute strategies to protect coral reef, mangroves, and beaches; (8) reduce coastal erosion; (9) execute policy to face sea-level rise among others. The CEACC follows that proposed action and territorial plans and policies will align with the mandates established by law. Congress can help by providing funding for the Plan's development, which would provide the blueprint to mitigate and adapt to climate change in Puerto Rico. The Plan will also establish funding priorities. C of fisheries. Congress can also approve much-needed funds to reduce water loss in the potable water system, implement EPA's WaterSense program in all hoods in the Island, and funds for dredging key water supply reservoirs and mitigate coastal erosion.

Also, Congress should be including Puerto Rico in all climate change initiatives that will be executed as a part of the nation-wide plan.

Question 2. As you know, coral reefs are crucial for Puerto Rico in a variety of ways, whether it is because of their ecological and environmental value, or their importance for our tourism and coastal economies. It is estimated that annually, reefs in Puerto Rico provide flood protection benefits to more than 4,200 people and \$184 million in averted damages to property and economic activity. According to NOAA, coral reef-derived tourism generates nearly \$2 billion in income and regional domestic product in Puerto Rico.

However, coral reefs also provide protection against natural disasters and coastal erosion. That's why I believe one of the most effective ways to ensure Puerto Rico and other U.S. coral jurisdiction have the necessary resources to combat climate change would be to reauthorize and strengthen NOAA's Coral Reef Conservation Program.

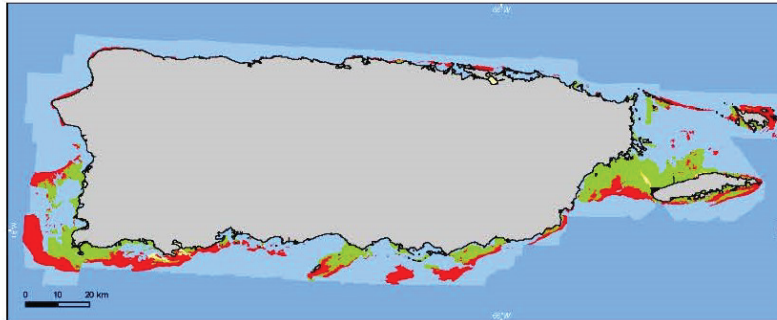
I've joined Congressman Soto and Senator Rubio in introducing the bipartisan and bicameral Restoring Resilient Reefs Act of 2021 (H.R. 160/S. 46), which would achieve just that.

As Secretary of the Puerto Rico Department of Natural and Environmental Resources, could you elaborate on the role coral reefs play in Puerto Rico and why reef conservation efforts are so important to build resilience and mitigate against the impacts of hurricanes and other phenomena?

Answer. Coral reefs are essential for 23 percent of fisheries. Moreover, coral reefs protect the coast from a hurricane and tropical storm waves. Coral reefs absorb up to 90 percent of the energy of these waves. If coral reefs disappear, more than 250,000 homes, all power plants, and 70 percent of Puerto Rico's wastewater treatment infrastructure would be destroyed.

Coral reefs form barriers to protect the coastal communities from waves and storms, attenuating their impacts. The coral reef structure buffers shorelines against floods, preventing loss of life, property damage, and erosion. In engineering terms, the coral 3-D structural configuration acts as a submerged dam setting. That is why reef conservation efforts are so important to build resilience and mitigate against the impacts of hurricanes and other phenomena.

Besides, coral reefs are home to many species. They are known to have the largest biodiversity globally, compared to the biodiversity found in a rainforest. They sustain many commercial fishes, representing an important food source to citizens and wildlife, like sea turtles and sharks. Coral reefs are part of the tropical coastal landscape. A variety of marine life depends on seagrasses, mangroves, and coral reefs. Those marine ecosystems intertwine and complement each other. That is our marine-scape in Puerto Rico.



Map: K. Buja (2008)

Challenges to coral reef protection are enormous in Puerto Rico and worldwide. For instance, decreases in pH within the water column can reduce corals' calcification rates and other calcifying organisms. Ocean acidification has significantly reduced reef-building corals' ability to produce their skeletons, posing a major threat to these organisms.

Local efforts can contribute to reducing acidification by mitigating runoff discharges and sediments across the rivers and creeks. There are green engineering techniques available to mitigate untreated discharges to the sea by creating wetlands in the main bodies of water in PR. Hydrographic basins previously identified for this purpose are the following: Guanajibo River (Mayaguez, west coast), Loco River (Yauco, south), Anton River (Humacao, east), and Loíza, Manatí, Arecibo Rivers (north coast). Second, there is a need to control and reduce the urban and industrial coastal development sewer discharges, including sanitary and stormwater sewer discharges. Primary treatment plants from the Aqueduct and Sewer Authority need to be upgraded, ideally to tertiary treatment plants, to remove nitrogen and phosphorus (nutrients that have been increasing the algae cover and their smothering effect over corals in the reefs).

Puerto Rico is the oldest or second oldest territory in the U.S. that implemented a coral reef monitoring program, and it is still running. This accomplishment has allowed us to analyze changes in coral reefs around the Island over time, among other benefits. Notwithstanding, there is an area of opportunity with regards to water quality. DNER would like to associate the state of the reefs with the condition of water quality. Our current resources have not allowed us to do so. We would

appreciate it if Congress could help us get funding to establish and continue a water quality monitoring program integrated with our coral monitoring program.

Work with communities is recommended to develop action plans based on preparedness and risk reduction activities to increase resilience to disasters and Climate Change. Some municipality mitigation plans have been developed, but more need to be prepared. Their implementation is also needed.

On the other hand, the emergent Stony Coral Tissue Loss Disease (SCTLD) aggressively spread on Puerto Rico's coasts. This disease was first detected in Florida, then in the Virgin Islands, and in Puerto Rico, was first seen in Culebra. It is now very troublesome on all the east coast, but it also affects corals in the south, southwest (La Parguera), and north. Once the coral is infected with SCTLD, the chances of survival are very low. The disease can kill a colony in a matter of days. Coral reefs in Puerto Rico are facing the worst threat in history with this disease. In collaboration with other entities, DNER is treating with antibiotics some sick coral colonies. However, the treatment needs to be significantly strengthened and widen. We would appreciate any prompt help Congress can provide to us. One of the actions honorable González may conduct is to urge NOAA to approve using their funds to treat infected corals. They are currently evaluating the treatment for NEPA approval. Until this approval is achieved, none of our NOAA funds could be expended for treatment. Meanwhile, we have been trying to get donations of the medicine. Funds are also needed to strengthen the implementation of Law 147 of 1999-PR Coral Reef Protection Act and its regulation.

Question 3. I think one of the biggest challenges we face in Puerto Rico when it comes to accessing Federal grants—including those to mitigate the impacts of climate change—is that often individuals, communities, and organizations on the Island simply do not apply for the program, either because they are not aware about the funding opportunity, or because they lack the necessary capacity and know how to go through the application process.

3a. Is this something you've seen or experienced yourself?

Answer. Yes.

3b. In your opinion, should Federal agencies invest more in raising awareness about existing funding opportunities to tackle these issues, building capacity among potential applicants, and simplifying the grant application processes?

Answer. One of the main constraints to accessing Federal grants to mitigate climate change are:

- i. the access of grant information announcement in time, and
- ii. the complexity of the grant application related to the administration process.

All of the above will help. However, a major obstacle is obtaining from IRS non-profit status, which is a prerequisite to receiving federal funds. The process is very cumbersome. Nonprofits have to pay up to \$5,000 for professional services to complete the process. Disadvantaged communities don't have this money to get the IRS nonprofit standing. The other major problem is filling up the paperwork.

Question 4. During the hearing, you mentioned that the most critical climate-related concern in Puerto Rico is coastal erosion.

4a. Can you elaborate on the impact coastal erosion is having on the Island?

Answer. Coastal changes have occurred in Puerto Rico, with erosion causing major problems. Coastal erosion results from the interaction of physical variables such as storm waves, swells, storm surge, storms that act over dunes, beaches, coastal bluff, and alluvial deposits, and other loosely consolidated coastal features. Human activities such as sand extraction, changes in land cover and land use (LCLUC), construction of hard structures in the shoreline, modification of coastal barriers, coastal deforestation, and extraction of sand from rivers, among others, are reducing in many cases the supply of sand to the beaches, causing coastal erosion. Also, the loss of sand is incrementing due to the effects of climate change. As sea levels rise, ocean acidification and the increase of storms' magnitude in the region decrease these coastal events' buffering effect.

For 2021, beach and coastal bluff erosions were the principal types of coastal erosion shown in Puerto Rico. Approximately 70 percent of the Island coastline was suffering erosion, causing important damages in critical infrastructure such as roads, schools, and recreation centers. Also, erosion is continuously reducing the natural buffering action of beaches and dunes and the quality and distribution of coastal ecosystems that depend on it as this main resource.

An overview of the Island's coastal erosion showed sand loss events affecting most beaches from the 1970s to 2010. Approximately 60 percent of the beaches in PR suffered erosion during this period (low (15.8 percent); moderate (14.9 percent); high (3.1 percent) and very high (5 percent) erosion rates) (Barreto et al. 2018). No severe erosion was identified from 1970 to 2010. However, severe erosion has been found at some coastal sites of PR since 2012. The loss of sand was mainly observed in beaches located in the municipalities of Loiza, San Juan, Arecibo, Hatillo, Arroyo, Dorado, and Rincón, where the significant loss of infrastructure—such as roads, buildings, and houses—was also identified (Barreto et al. 2020). Human activity, such as built-up structures, along the shoreline, was one of the variables identified in some beaches that experienced erosion for this period. The loss of infrastructure was observed at many coastal sites where infrastructure was located along the beachfront and faced erosion problems before Hurricane Maria (Federal Emergency Management Agency [FEMA] 2018).

Hurricane Maria caused significant beach erosion along the coastline of the Island. Most beaches suffered a loss of beach elevation. Furthermore, beach width changes were highly variable along the coastline of PR. Major losses in beach width were identified in beaches located in the west-northwest, north-central, and southeast municipalities of the main Island. An increase in erosion was observed mainly in beaches with previous erosion history and/or high human intervention levels along the coast. Minor beach changes and accretion were identified in beaches with natural barriers, such as coral reefs and mangroves, mainly located in the northeast and southwest of the Island. Beach progradation and retreat may affect the enhancement and/or reduction of these geographic areas' beach resilience capacity. This new geomorphic state of the beaches in PR will be important to define beaches' buffer capacity when facing future extreme meteorological and oceanographic events.

For the 2018 period, major erosion was identified in coastal sites in the Arecibo, Hatillo, Aguada, Añasco, San Juan, Loiza, Arroyo, Humacao, Dorado, Mayagüez, Cataño, Vega Baja and Manatí municipalities. Major erosion (beaches and coastal bluff) was identified at Arecibo. Loss of sand is mainly caused by the combination of wave regime, winter storms, swells, cold fronts, human impact. The erosion of the coastal cliff is causing significant damage to the infrastructure of Arecibo's "Barrio Pueblo" and its nearby areas. As well as the area of Ocean Park and Condado in San Juan (Mendez-Tejeda, et al 2020). Schools, roads, recreational areas, and services infrastructures related to water distribution and treatment and electricity generation and distribution were exposed in coastal sites affected by erosion. Significant coastal bluff erosion was identified at Arecibo, Humacao, Yabucoa, San Juan (Puerta de Tierra) and Toa Baja (Isla de Cabra). Coastal bluff erosion increases the exposition of critical infrastructure as principal roads and state buildings at Puerta de Tierra at San Juan.

Approximately 18 percent of the population was exposed to multi-coastal risk in Puerto Rico. These people (496,442) live in the Coastal Zone (legal unit defined by the Government), and 14 percent of people live in coastal areas from 0 to 3 meters of elevation at the Island. This population is highly exposed to coastal erosion, sea-level rise, storm surge, storm waves, and tsunami events.

4b. What actions or policies would you recommend Congress adopt to help mitigate and address this issue?

Answer. The following actions are recommended to mitigate coastal erosion, promote safety and wellness as well protect infrastructure and economic development at the Island: (1) strengthening natural barriers, such as beaches, dunes, coral reefs, seagrass beds, and beach rocks; (2) conducting offshore investigations to identify sediment sources for beach and dune restoration; (3) limiting new constructions in selected high-vulnerability areas; (4) critically evaluating the need to reconstruct infrastructure damaged by the storm; (5) use of green and blue infrastructure as a one of the mitigation strategies; (6) evaluating relocation based on vulnerability and feasibility, with coastal communities being involved in the process; (7) use coastal vulnerability (social, physical and infrastructure) as a one of the metrics to determine priorities in the mitigation processes; (8) conducting a detailed evaluation of coastal erosion as a part of the assessment of the hazards that may affect PR; (9) use scientific data as a baseline of coastal management decision-making processes; (10) support studies of coastal changes to gathering continuous data for the availability of updating data for the 44 coastal municipalities; (11) pronouncing beaches, dunes, coral and mangroves as a vital infrastructure of PR and treating them as such; and (12) evaluate the possibility of revising the cost-benefit metric application over the Puerto Rico territory. This metric is one of the criteria used to decide priorities in the coastal mitigation process.

It is important to execute the different mitigation interventions (e.g., protection, adaptation, and relocation) according to the new coastal scenario on the Island based on post-storm a seismic event by geographic area. It is also necessary to improve non-structural intervention as an important part of the decision-making process in the Island.

Question 5. As we briefly discussed in the hearing, the Puerto Rico Department of Natural and Environmental Resources (DNER) participates and receives funding under various NOAA programs, including the National Coastal Zone Management Program and the Coral Reef Conservation Program. Additionally, DNER oversees the Jobos Bay National Estuarine Research Reserve, which is part of NOAA's National Estuarine Research Reserve System.

Can you discuss the importance of these programs for Puerto Rico and how they help DNER combat the impact of climate change on the Island?

Answer. The DNER PR Coral Reef Conservation and Management Program supports the conservation, protection, and restoration of coral reefs across Puerto Rico. Coral reefs are vulnerable to climate change yet are key players in protecting our coastal habitats and population from climate change impacts, so their protection is vital. Coral reefs attenuate wave energy and reduce subsequent coastal erosion processes from storms, surges, and other high wave energy events. Coral reefs in the U.S. provide flood risk reduction, which has an annual estimated value of \$1.805 billion (2010 U.S. dollars) (Storlazzi et al. 2019). Due to their importance in coastal protection, coral reefs are considered critical infrastructure by Puerto Rican law.

The PR Coral Reef Conservation and Management Program implements and supports various projects around the Archipelago to promote coral reef health and recovery. A programmatic project of this Program is the monitoring of 42 coral reef permanent stations around the Archipelago. This is the second oldest coral monitoring sub-program in the U.S., collecting benthic data since 1999 to establish tendencies and document change over time. Education and outreach to the public and stakeholders conducted by the Program promote these resources' responsible use to avoid damage from anchoring, groundings, and other direct interactions that cause coral mortality. By restoring coral reef ecosystem function through coral restoration and disease response efforts, the PR Coral Reef Conservation and Management Program is protecting associated ecosystems, including Puerto Rico's fisheries resources and coastal infrastructure for the Island.

The Coastal Zone Management Program, managed by the DNER, is a federal grant focused on the following components: wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management planning, ocean resources, energy, and government facility siting and aquaculture. In our Program, a lot of attention and funds have been granted to address Climate Change, especially coastal erosion and coastal hazard mitigation. The Coastal Zone Program has coordinated the preparation of coastal mitigation plans of several municipalities. A lot of surveying work associated with the maritime zone has been performed. The Council of Climate Change was formed through the Coastal Zone Program to share information and recommendations among multiple scientists of different fields and other stakeholders. Several documents have been produced on the subject. Even though significant works have been achieved regarding Climate Change and coastal protection in Puerto Rico, there is no secured and recurring budget aimed at mitigating the impacts of Global Warming in PR. Congress is welcome to aid in this important matter.

The Jobos Bay Estuarine Research Reserve (JBNERR) is a natural protected area in Salinas and Guayama, geared toward research, education, and outreach. The Reserve operates fully with NOAA funds. This protected area has coral reefs, mangroves, coastal lagoons, salt flats, and important wildlife resources. Recently, the SCTLD was detected in Jobos Bay. Unfortunately, approximately 70 percent of the corals were infected in a very short time frame, and many have already died.

Among the research efforts being conducted, there is the Sentinel Initiative. It mainly consists of monitoring the advances of sea-level rise in the reserve areas such as mangroves over time. We have permanent areas being monitored. Besides, JBNERR has a Coastal Training Program. Different audiences get educated on relevant subjects. The Sentinel Program and other research initiatives in JBNERR, the Coastal Training Program, and the Education and Outreach Program help combat climate change on the Island.

Question 6. In your written testimony you call for additional technical assistance for water conservation efforts and initiatives that help reduce portable water loss in the distribution system, among other issues.

Last Congress, I introduced legislation—H.R. 6050, the Puerto Rico WaterSMART Grants Eligibility Act—to make Puerto Rico an eligible jurisdiction for the Bureau of Reclamation’s WaterSMART Grants Program and Drought Resiliency Project Grants Program. These programs provide cost-shared Federal funding for projects that conserve and use water more efficiently and contribute to water supply reliability, as well as to increase resiliency to drought by funding on-the-ground projects that improve water management flexibility during periods of low water supply.

Originally, eligible applicants for these grants had to be located in one of the 17 western states or the small U.S. territories. In 2019, Congress made Alaska and Hawaii eligible applicant locations as well, meaning that Puerto Rico was the only territory and non-contiguous jurisdiction in the United States where these water conservation grants were not available. My bill sought to address this exclusion.

The Puerto Rico WaterSMART Grants Eligibility Act was enacted into law in December 2020 as part of the FY2021 omnibus funding package. Now that the Island is eligible for these grants, I would encourage you and the Puerto Rico Climate Change Experts and Advisory Committee to engage with the Bureau of Reclamation, as this funding opportunity might help address some of the long-standing water conservation and supply issues we face in Puerto Rico.

Could you briefly elaborate on the need to invest in water conservation projects in Puerto Rico? Why is it so important?

Answer. Climate change is already affecting water availability and will exacerbate the situation in the near future. It is important to mention that the lack of water will impact one of the main sources of Puerto Rico’s economy, which is tourism, as well as agriculture and livestock.

Sea level rise has increased saltwater intrusion into our aquifers. This is particularly critical on the south coast. The Department of Natural and Environmental Resources (DNER) formally declared the Southern Aquifer in “critical condition”, which means that if immediate measures are implemented, the whole aquifer will be lost to seawater intrusion. The DNER implemented a ban on the drilling of new wells and a ban on increasing groundwater pumping from existing wells. Since the situation continued to deteriorate, DNER imposed a construction ban in the Municipality of Salinas. Since sea level will continue to rise and a rainfall shortfall is predicted by 2030, a construction ban will be implemented in other municipalities on the South coast if other measures are not established.

Climate change has increased the frequency of severe droughts. In 2015, a severe drought affected half of the Island for 5 months. As a result, the Government of Puerto Rico implemented water rationing. First, every other day, then every 48 hours, and finally, 3 days straight without water service followed by 24-hour service. The rationing cost \$1 billion to the Puerto Rico Economy. Last summer, we suffered another drought which prompted water rationing. This time every other day.

Hurricane María destroyed 144 million trees, which has exacerbated the sedimentation of our drinking water reservoirs. Some of our key reservoirs have lost more than 50 percent of storage capacity. According to NOAA, Puerto Rico will suffer a 10 percent rainfall shortfall by 2030, so the above-described water scarcity events will be exacerbated. To address the water scarcity that Puerto Rico is facing and will face in the immediate future, the following is needed:

1. Dredging of key reservoirs.
2. Reducing water loss in the distribution system from 60 percent to 17 percent.
3. Reuse of treated wastewater.
4. Implementation of EPA’s WaterSense water conservation program.
5. Rainfall harvesting in new homes.
6. Use of home cisterns.

The CHAIRMAN. Thank you very much, Mr. Secretary.

Now let me recognize Ms. Zena Grecni, Sustained Climate Assessment Specialist, East-West Center.

The time is yours. Thank you very much for being here. We look forward to your testimony.

STATEMENT OF ZENA GRECNI, SUSTAINED CLIMATE ASSESSMENT SPECIALIST, EAST-WEST CENTER, HONOLULU, HAWAII

Ms. GRECNI. Aloha and good afternoon. Thank you, Chairman and distinguished Committee members, for this opportunity to testify.

My name is Zena Grecni, and I am the Sustained Climate Assessment Specialist at the East-West Center in Honolulu. I have worked for more than a decade in Hawaii and the U.S.-affiliated Pacific Islands, or USAPI. This is the region that includes American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and the Freely Associated States.

I coordinate the Pacific Islands Regional Climate Assessment, or PIRCA, our regional assessment effort, and serve as an author on its recent reports as well as on the U.S. National Climate Assessment.

Climate change has arrived in the Pacific Islands. Governments and leaders are taking the impacts seriously and are committing the resources, time, and creativity to keep people safe, while fostering adaptation and practical planning for the future. Yet, climate change remains the greatest challenge to our region.

Without increased support, adaptation will not approach the scale needed to meet the multiple crises that climate change will bring to the U.S.-affiliated Pacific Islands, home to nearly half a million people.

I am therefore pleased and excited by the introduction of the Insular Area Climate Change Act, which will leverage the considerable efforts of Pacific Island governments and communities and further build local adaptive capacity.

The Act will help address unique risks to our region. In 2018, we saw Super Typhoon Yutu damage and destroy a significant portion of buildings and infrastructure in the Northern Mariana Islands, requiring more than \$100 million in public assistance.

Scientists have reported an increase on average in tropical cyclone intensity globally, and they expect further increases in the strength of hurricanes and typhoons as the climate warms, amplifying the potential for severe damage.

Even small increases in average sea level could be disastrous for the Pacific Islands, where the majority of infrastructure and communities lie along the coast near sea level. And as Ambassador Zackios referenced, it is an existential threat for the Marshall Islands and other low-lying atolls. Sea-level rise is expected to accelerate strongly after mid-century, highlighting the need for adaptive action now to avoid higher long-term costs.

Wildfire, drought, hotter weather, and more extreme rainfall events threaten public health and the provision of critical services, like safe drinking water. Compound impacts could cause severe disruptions to livelihoods and could compel migration.

What approaches are needed to address these unique risks? Some of the most cost-effective climate solutions involve boosting the resilience of local ecosystems. Coral reefs inject hundreds of millions of dollars into local economies each year and offer vital protection from coastal flooding. In Guam, reef-related tourism alone adds \$323 million per year.

Severe coral bleaching is now more frequent and is expected to happen annually before 2050 if current warming continues. Programs and grants under this Act would therefore catalyze and scale up vital coral reef conservation and restoration programs.

Basing management decisions on past experience alone is kind of like trying to drive by looking in the rearview mirror. More data is needed to see the upcoming curves in the road. This Act would expand climate monitoring through existing NOAA programs, helping to guarantee that we have fine-scale projections for a region that currently lacks them.

Ultimately, the data must reach managers who can apply it, and my team supports that kind of work. I am part of the Pacific RISA, one of several Regional Integrated Sciences and Assessments Programs that the NOAA Climate Program office funds to help managers produce actionable research and help them to evaluate and identify adaptation actions.

The proposed Insular Area Climate Change Task Force would point to ways to provide more equitable access to territories and Freely Associated States to Federal climate change programs. I would suggest that the task force include heads of state, governors, and presidents as members and advisors to better guarantee the success of new and existing programs.

Other potential blind spots in the curve are shifts in global energy supply and prices. The U.S.-affiliated Pacific Islands, again, here, are very vulnerable, as they are dependent on imported fossil fuels, and electricity prices for residents are higher than the U.S. average.

Titles IV and V of the Act would inject critical funds to U.S. territories and Freely Associated States to access renewable sources of reliable renewable energy and increase their resilience to extreme weather and price shocks.

Because Pacific Islands have constrained financial, technical, and human capacity, the Act rightly puts emphasis on programmatic coordination and technical assistance. Local training and capacity-building are essential.

The Pacific RISA stands ready to support important new programs for the U.S. insular areas to address climate change.

Thank you.

[The prepared statement of Ms. Grecni follows:]

PREPARED STATEMENT OF ZENA GRECNI, SUSTAINED CLIMATE ASSESSMENT
SPECIALIST, EAST-WEST CENTER

Chair Grijalva, Ranking Member Westerman, and distinguished members of the Committee, it is an honor to submit this written testimony in support of the Insular Area Climate Change Act.

My name is Zena Grecni, and I am the Sustained Climate Assessment Specialist with the Pacific RISA team based at the East-West Center in Honolulu. The Pacific RISA is one of 11 Regional Integrated Sciences and Assessments (RISA) teams funded and supported by the NOAA Climate Program Office to build the nation's capacity to prepare for and adapt to climate variability and change. I have worked in the Pacific Islands region for more than a decade, supporting Pacific Island governments and communities by conducting research and synthesizing climate information.

As the Sustained Climate Assessment Specialist for Hawai'i and the US-Affiliated Pacific Islands (USAPI), I coordinate a regional climate assessment effort, the Pacific Islands Regional Climate Assessment (PIRCA), comprised of local governments, NGOs, and academic organizations, and supported by Federal entities. To

increase representation of the USAPI (American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and the Freely Associated States under the Compact of Free Association) in regional and national assessments, the PIRCA is conducting climate assessments for each of the USAPI countries and territories. The PIRCA reports summarize up-to-date climate trends and projections for Pacific Islands, and detail specific ways that climate change is affecting critical sectors. Each report was co-authored with local experts and involved collaboration with 30 to 50 technical contributors across a range of essential sectors. I served as an author on three of these assessments released in the past year, including as lead author on assessments for Guam and the Commonwealth of the Northern Mariana Islands (CNMI). I was also an author of our region's chapter in the Fourth US National Climate Assessment, Volume 2, released by the US Global Change Research Program in 2018.

Climate change has arrived in the Pacific Islands. I have spoken with public officials struggling to help their communities to recover from the strongest storm ever to strike US soil. I have witnessed coral reefs dying record-high temperatures. Governments and leaders are taking the impacts seriously and are committing resources, time, and creativity to keep people safe, while fostering adaptation and practical planning for future climate-related risks. Yet climate change remains the greatest challenge to the region.

I am therefore pleased and excited by the introduction of the Insular Area Climate Change Act, which will support the considerable efforts of Pacific Island governments and communities. Without increased support, adaptation will not approach the scale needed to meet the multiple crises that climate change will bring to Pacific islands, the beloved home to nearly half a million people. By necessity, Pacific Island governments have recently focused on addressing extreme weather events and the COVID pandemic more than on actions to respond to future climate risks and emerging threats. Despite setbacks, Pacific Island peoples have nonetheless shown time and again that adaptation and resilience are at their core and that they are willing and ready to partner with US Federal entities and the international community on durable, scalable solutions to the climate crisis.

THE NEED FOR UNIQUE CLIMATE PROGRAMS FOR INSULAR AREAS IN THE PACIFIC

The Pacific Islands region contains an area larger than the continental United States, including 50% of the US Exclusive Economic Zone and key strategic sites for the US Military. The US Pacific Island Insular Areas—also known as the USAPI—are culturally, socially, and economically diverse.

Communities in the USAPI are already experiencing unique impacts from climate change, which are well-documented. The Fourth US National Climate Assessment describes the key climate-related challenges that the Pacific Islands already face and what lies ahead:

- Dependable and safe water supplies are at risk from rising temperatures, changing rainfall patterns, sea level rise, and increased risk of extreme drought and flooding. Some islands already experience saltwater contamination of fresh water supplies or periodic extreme droughts (Keener et al. 2018, Key Message 1). Because of the remoteness of islands, responses to water scarcity have involved delivery of water and deployment of emergency reverse osmosis units by the US Navy at a high cost (Keener et al. 2018; Keener et al. 2012).
- Sea level rise is now beginning to threaten critical infrastructure. Even on islands with higher land elevations, most infrastructure and communities are typically confined to a narrow band of land within a few feet of sea level. The USAPI will experience higher sea level rise than the global average (Sweet et al. 2017). Sea level rise projected during this century will threaten the food and freshwater supplies of Pacific island populations and jeopardize their continued sustainability (Keener et al. 2018, Key Message 3).
- Coral reefs and ocean resources are inseparable from well-being in the Pacific because they underpin livelihoods, culture, and economies. Widespread coral reef bleaching and mortality now occur more frequently than before. By mid-century, the conditions for severe coral bleaching are projected to occur annually if current warming trends continue (see Figure 1). This could result in the loss of reef structures, leading to the loss of coastal protection and fish habitat that reefs provide (Keener et al. 2018, Key Message 4).
- Climate change impacts are expected to amplify existing risks, such as the spread of disease and the prevalence of poor health outcomes. In some locations, compounding impacts may result in severe disruptions to livelihoods

that increase the risk of human conflict or compel the need for migration (Keener et al. 2018, Key Message 6).

- All of these changes imperil the health and well-being of Indigenous communities of the Pacific (Keener et al. 2018, Key Message 5).

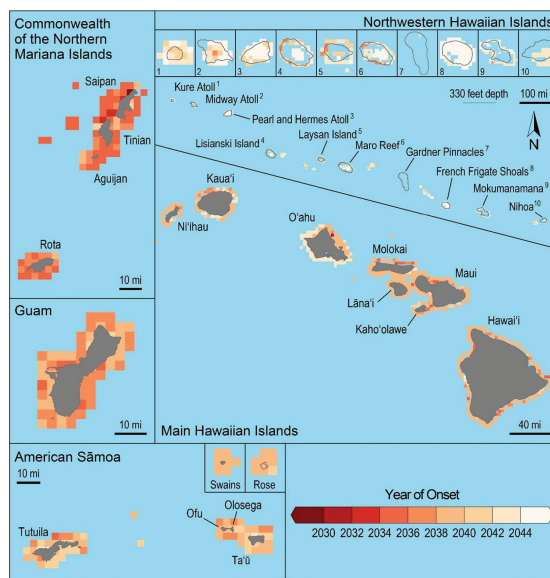


Figure 1. The figure shows the years when severe coral bleaching is projected to occur annually in the Hawai'i and the US-Affiliated Pacific Islands region under a higher emissions scenario (RCP8.5). Darker colors indicate earlier projected onset of coral bleaching. Under projected warming of approximately 0.5°F per decade, all near-shore coral reefs in the region are expected to experience annual bleaching before 2050. Source: Keener et al. 2018; NOAA.

The PIRCA assessment delves deeper into some of the impacts, further examining the situation in specific USAPI locations. For instance, the increasing power of hurricanes, also called tropical cyclones and typhoons in our region, puts island populations and infrastructure in a uniquely vulnerable state. In 2018, seven tropical cyclones, typhoons, and super typhoons damaged infrastructure, claimed lives, and destroyed ecosystems across the Pacific Islands in quick succession, causing billions of dollars in direct damages. A major disaster was declared when Super Typhoon Yutu struck the Northern Mariana Islands in October 2018. Torrential rain and sustained winds of 130–180 miles per hour killed two citizens, injured at least 133 others, and damaged or destroyed significant portions of the islands' buildings and critical infrastructure (FEMA 2020). Applications for individual assistance from FEMA amounted to \$40.5 million and public assistance provided was \$131 million (FEMA 2020).

The inaccessibility of Pacific Islands means that recovery from such events is especially challenging. Super Typhoon Yutu caused widespread power outages, severed water lines, produced a sizable homeless population, and entailed extensive debris removal. Hazardous waste removed from damaged and destroyed households filled 193 shipping containers (FEMA 2020). School was disrupted for all students and many moved to temporary classrooms supplied by FEMA, some used for a year or more after the typhoon. There is scientific consensus that tropical cyclone intensity—the strength of hurricanes and typhoons—is likely to increase in a warming world (Kossin et al. 2017; IPCC 2013; Knutson et al. 2015; Kossin et al. 2020). Already, cyclone intensity has increased globally over the past four decades (Kossin et al. 2020). An increase in maximum typhoon intensities in the Pacific will amplify the potential for severe damage. The Insular Area Climate Change Act, particularly directly sections 404, 502–503 and 601–602, would reduce the potential for harm and increase the ability of communities to recover from major storms.

Increasingly dangerous storms are not the only extreme climate events that require adaptations and weather-proofed infrastructure. Wildfire, drought, hotter temperatures, and more extreme rainfall events present issues for the reliable provision of critical services. As we witnessed millions of Texas residents under a boil water advisory in the past weeks, I thought of the residents of American Samoa for whom unsafe water is a long-term reality. Boil water advisories have been in effect on the most populated island of Tutuila for more than a decade (Wallsgrove and Grecni 2016). Climate change and increasingly intense storms promise to further hinder provision of clean water for drinking and household use.

Even small increases in average temperatures can increase extremes. Hot weather is known to increase hospitalizations and deaths among people with pre-existing cardiovascular, kidney, and respiratory disorders (Sarofim et al. 2016). Non-communicable diseases are already leading causes of death in the USAPI territories, where medical services cannot match those available in most of the Contiguous US. NOAA weather stations have documented an increase in hot days across the Pacific Islands, and 2019 was the hottest year on record in Oceania (Grecni et al. 2021; NOAA NCEI 2021).

Governments and leaders cannot afford to simply watch these impacts unfold. They are engaging in adaptation in many forms. Resilience-building is evident in policies, plans, management actions, and international engagement by Pacific leaders. American Samoa's Governor created the American Samoa Climate Change Task Force; similarly, the Governor of Guam through Executive Order 2019-19 established Guam's Climate Change and Resiliency Commission, with the objective to develop an integrated strategy to build resilience against adverse climate impacts; the CNMI adopted Safe, Smart Growth Guidance; the Republic of Palau established a National Office of Climate Change and adopted the Palau Climate Change Policy, with an action plan and timeline for updates. The result of these actions, and others, is that US Insular Areas in the Pacific now have durable institutions in place that can identify high priority needs, develop proposals for funding, and coordinate cross-sectoral projects.

Nevertheless, adjusting to the impacts of climate change presents logistical challenges and entails higher costs for the USAPI than for locations in the Contiguous US. Materials must be shipped in at great cost, and experienced contractors must be engaged from overseas. Recruiting contractors is particularly complicated now that COVID has necessitated travel restrictions. Because the USAPI have constrained human and technological capacity, the Insular Area Climate Change Act rightly puts emphasis on programmatic coordination and technical assistance. Local training and capacity building are essential for maintaining any new infrastructure or programs.

The National Climate Assessment underscored the importance of early adaptation in avoiding accelerating costs. The savings in the long-term from adaptation are expected to be several times the up-front costs and can generate co-benefits (Lempert et al. 2018). Sea level rise, for example, is projected to accelerate strongly after mid-century, so adaptation strategies implemented sooner can better prepare communities and infrastructure, avoiding more severe impacts.

CORAL REEFS ARE CRITICAL LIFELINES

The PIRCA has highlighted just how integral healthy coral reefs are to the ongoing sustainability of Pacific Island populations, economies, and cultures. Reefs and connected nearshore ecosystems inject hundreds of millions of dollars into Pacific Island economies every year. The total economic value of the CNMI's coral reefs and connected seagrasses were estimated at \$115 million USD, including all goods and services that reefs provide, the value to tourism, and the cultural and social value (Eastern Research Group 2019). In Guam, reef-related tourism alone was estimated at \$323 million USD per year (Spalding et al. 2017). Coral reefs currently offer \$17 million USD annually in protection for buildings and economic activity from coastal flooding in Guam and \$15 million USD annually on Saipan (Storlazzi et al. 2019).

Given the enormous value coral reefs represent, it is troubling that multiple, consecutive coral bleaching events in recent years led to mass reef mortality in some locations. Bleaching events in 2017 caused 90% mortality of some branching coral species in the Saipan Lagoon, well-documented by local scientists and management agencies (CNMI Coral Reef Initiative 2019; Maynard et al. 2019). In the CNMI and Guam, the conditions for significant bleaching are expected to occur on an annual basis starting between 2030 and 2040 (van Hooidonk et al. 2016). Research has identified places have the greatest potential for reef resilience and thus represent

wise investments in conservation (Schumacher et al. 2018; Maynard et al. 2019; Gouezo et al. 2017; Miles et al. 2020).

Despite the urgent need to protect and restore reefs, funding levels remain low. According to a coral management specialist in the Northern Mariana Islands, it is like trying to run an emergency room stocked only with boxes of Band-Aids. Funding for targeted coral reef conservation in the CNMI has averaged less than \$1 million USD annually in recent years. A significant portion of this funding has been allocated to outreach, reducing stresses on corals, and studying coral health. These activities create a good foundation for coral restoration by reducing non-climate threats and providing data to inform managers, yet coral restoration has barely begun in the USAPI. Scientists and managers identify the need for greatly increasing coral restoration to reach a meaningful scale. Saipan Lagoon alone has more than 1,500 acres of coral reef habitat, almost all of which could benefit from increased restoration and management effort. This entails hiring qualified people to implement, manage, and maintain projects. To realize the benefits from investments in coral reef restoration, programs must build local capacity to ensure that the application of new expertise, technology, or tools are sustained.

Examples of projects that are ready to be implemented or scaled up include: (1) both in-situ and ex-situ coral propagation; (2) expanding existing in-water coral nursery networks; (3) developing a portfolio of coral conservation and restoration options that could function as a “mitigation bank” to offset any unavoidable impacts from US Military operations in Guam and the CNMI; and, (4) enhancing post-disaster response and recovery with measures that restore corals in areas providing substantial protection for infrastructure from extreme storms. Great progress was made in the Caribbean after Hurricane Maria, where Puerto Rico and the US Virgin Islands were able to include coral reef work under FEMA recovery support functions. Similar programs for post-disaster recovery could be made available to the USAPI.

Sections 103 (Coral Reefs Prize Competitions), 301 (Climate Change Insular Research Grant Program), and 302 (Coastal Management Technical Assistance and Report) of the Insular Area Climate Change Act can enable research and, most importantly, give a boost to innovative coral reef conservation programs, ultimately making reefs more resilient and bolstering the lifeline services they provide.

ACTIVE CLIMATE MONITORING IS NEEDED FOR IMPROVED MODELING AND FORWARD-LOOKING MANAGEMENT

Basing management decisions on past experience alone is like trying to drive by looking in the rearview mirror. It risks missing upcoming curves and going dangerously off the road. For decision-makers today, climate change is a big curve in the road.

The Pacific RISA and the PIRCA have documented the need for increased climate monitoring in the Pacific Islands for more than a decade. Quality climate data is needed to produce more reliable forecasts and future projections that enable managers to construct reasonable future scenarios. Throughout the USAPI, stations collecting climate data (air temperature, rainfall, wind speeds, etc.) have changed location, and station records are not continuous. Tracking climate trends requires consistent data records of 30 years at the same location, yet only a few locations in the USAPI have data records of sufficient quality.

Federally produced fine-resolution projections are currently available to the Contiguous US States but do not extend to the USAPI. Developing localized predictive modeling for infrastructure planning, agriculture, and a range of other applications would require more data collection stations and, ideally, fine-scale, gridded data. This bill would be a big step toward making the types of data currently available to the Contiguous US also available to the USAPI.

The existing climate data are also difficult to access online in formats suitable for non-specialists. A central data portal for the USAPI could increase data access and use. The US Climate Explorer serves this purpose for all US states but is not available currently for the USAPI.

Sections 303 (National Weather Service Technical Assistance and Grants) and 304 (Ocean and Coastal Mapping Integration) of the Insular Area Climate Change Act would expand the ability of existing NOAA programs to fill data gaps. Although the Act does not specifically provide for it, there is a great need for better understanding of surface water and groundwater systems. The PIRCA technical contributors identified the need for information about the impacts of climate change to island-specific water budgets (Grecni et al. 2021), such as a study done by the USGS looking at water resources under climate change in Guam (Gingerich et al. 2019). Insight into

water supplies can help water managers enhance water sustainability and identify solutions, such as conservation measures or storage and recharge mechanisms.

REGARDING RENEWABLE ENERGY PROGRAMS FOR US INSULAR AREAS IN THE PACIFIC

Other potential blind spots in the curve brought on by climate change are the shifts in global energy supply and prices. The Pacific Islands are highly dependent on imported fossil fuels, leaving them vulnerable to global oil price fluctuations that directly impact the cost of electricity. American Samoa relies on fossil fuel (primarily diesel) for 97% of its electricity generation; nearly 100% of CNMI's electricity is generated using heavy fuel oil; in Guam, 96% of electricity is generated using fossil fuels, with only 4% coming from solar (NREL 2020a; NREL 2015; NREL 2020b).

Electricity prices for residential customers in the USAPI are above the US average. American Samoa's electricity rate for residential customers is \$0.33 USD per kilowatt-hour (kWh); CNMI's residential rates are \$0.21 to \$0.35 USD/kWh; Guam's residential rate is \$0.20 USD/kWh; and the Freely Associated States have rates ranging from \$0.27 to \$0.43 USD/kWh (NREL 2020a; NREL 2020c; NREL 2020b). All are well above the \$0.13 USD/kWh average US residential rate, while per capita GDP is well below that of any US state.

USAPI CLEAN ENERGY INITIATIVES PROVIDE A SOLID FOUNDATION, BUT UPDATES ARE NEEDED

Title IV of the Act, particularly sections 403 (Energy Efficient Product Rebate Program), 404 (Renewable Energy Grant Program), and 406 (State Energy Program Non-Federal Cost-Share Waiver), and Title V, section 504 (Insular Area Renewable Energy Grant Program), would support the renewable energy targets set by USAPI governments and protect island communities. Pacific Island governments have demonstrated they are ready to implement renewable energy and energy efficiency projects but need support to do so.

The USAPI countries and territories have experience with successful small-scale renewable energy projects, particularly small-scale solar photovoltaic (PV) projects, demonstrating the economic and social benefits of such projects and the strong potential for increasing renewable energy generation. Furthermore, major electric utilities in American Samoa, Guam, and CNMI have net-metering in place. Issues remain with ensuring maintenance of new infrastructure and the capital investment needed to dramatically scale up renewable energy.

The US Department of the Interior (DOI) Office of Insular Affairs (OIA) funded the National Renewable Energy Laboratory to conduct initial technical energy assessments for American Samoa, the CNMI, and Guam. With the technical assessments and a Territory energy summit as a springboard, the Pacific Island Territories each established through executive orders nonregulatory advisory groups: the American Samoa Renewable Energy Committee, the CNMI Energy Task Force, and the Guam Energy Task Force.

In 2010, the CNMI Energy Task Force developed the *Commonwealth of the Northern Mariana Islands Strategic Energy Plan* with a focus on energy efficiency and renewable energy. In partnership with the US DOI OIA and the US Department of Energy's National Renewable Energy Laboratory, in 2013 the CNMI Energy Task Force created an Energy Action Plan that outlines near-term strategies for increasing energy efficiency and renewable energy technologies, and decreasing reliance on electricity generation from fossil fuels (NREL 2015).

With the potential for growth in energy demand due to the anticipated military build-up and the need for increased economic self-reliance, Guam has invested in energy conservation and efficiency, renewable energy, efficient transportation, green building design, and smart grid technologies. The *Guam Energy Action Plan* created by the Guam Energy Task Force identified strategies achievable in a short time-frame.

Guam and the CNMI have sufficient wind and solar resources to make a significant shift toward renewable energy. However, potential impacts on threatened bird species and typhoon-level winds may complicate the siting of wind turbines.

The American Samoa Renewable Energy Committee's activities have included expanding solar energy installation, exploring the option of geothermal energy, and developing a waste to energy plant. In 2017, the island of Ta'u converted their energy production from 100% diesel to an entirely solar-powered microgrid. With a population ranging from 200–600 people, the \$8 million project was funded by the DOI and the American Samoa Power Authority and installed by Tesla, demonstrating that energy sustainability is possible on small Pacific Islands.

Updates are now needed to the Energy Action Plans to account for more recent technological advances, the landscape of private- and public-sector partners, and new understanding of best practices. All of the Energy Action Plans call for pursuing finance mechanisms, such as grants and public-private partnerships, for renewable power generation, energy efficiency, and energy conservation projects. The new programs detailed in the Insular Area Climate Change Act, Titles IV and V, would make great progress toward providing the US Territories and Freely Associated States reliable sources of renewable energy while increasing resilience to extreme weather and global energy price shocks.

ADDITIONAL SPECIFIC CONSIDERATIONS FOR THE INSULAR AREA CLIMATE CHANGE ACT

- The Insular Area Climate Change Act establishes the Insular Area Climate Change Interagency Task Force (section 101) to evaluate and identify ways to provide greater access to the Territories and Freely Associated States to climate change-related Federal programs. Including the heads of state of the Territories and Freely Associated States (the Governors and Presidents) as members or advisors to this Task Force would ensure that the leaders responsible for the management of critical infrastructure and natural resources are at the table and can help to ensure success of Federal programs. Pacific RISA has demonstrated that working directly with governments fosters ownership of assessments, and results in lasting relationships and two-way communication that ensures use of Federal science products and resources in climate adaptation. The inclusion of heads of state would follow on a successful Federal model of the US Coral Reef Task Force, which includes freely elected leaders from the US Insular Areas. In Guam, the US Coral Reef Task Force has worked effectively across levels of government to coordinate and support coral reef management.
- The programs and funding for US Insular Areas within the Office of Insular Affairs and NOAA's Office for Coastal Management would provide technical assistance for climate change planning, mitigation, and adaptation. Some flexibility in the language of the bill to support the implementation of the projects that include nature-based solutions, would increase the Act's effectiveness. I also suggest that involvement of the NOAA Climate Program Office, including the NOAA RISA teams, could be valuable, as they have existing programs providing information and assistance to support climate risk management and adaptation in the USAPI.
- Pacific Island economies are struggling to recover from the collapse of tourism, an economic mainstay, due to COVID-19. The waivers of Non-Federal matching requirements for the grants listed in this legislation will remove a barrier to resourcing projects that directly address climate change and improve economic resilience.
- Pacific RISA stands ready to support new programs for the US Insular Areas in the Pacific with actionable research that brings together natural resource managers, decision-makers, and scientists to better evaluate climate risks and prioritize needed adaptations with the most up-to-date science.

Thank you.

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The following documents were submitted as supplements to Ms. Grecni's testimony. These documents are part of the hearing record and are being retained in the Committee's official files:

- *Climate Change in the Commonwealth of the Northern Mariana Islands: Indicators and Considerations for Key Sectors*. Report for the Pacific Islands Regional Climate Assessment. East-West Center, 68 pp, <https://www.eastwestcenter.org/PIRCA-CNMI>
- *Climate Change in Guam: Indicators and Considerations for Key Sectors*. Report for the Pacific Islands Regional Climate Assessment. East-West Center, 60 pp, <https://www.eastwestcenter.org/PIRCA-Guam>
- *Climate Change in Palau: Indicators and Considerations for Key Sectors*. Report for the Pacific Islands Regional Climate Assessment. East-West Center, 68 pp, <https://www.eastwestcenter.org/PIRCA-Palau>
- “Hawai’i and the U.S.-Affiliated Pacific Islands” in *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment*, Vol. II, US Global Change Research Program, 1242–1308, <https://nca2018.globalchange.gov/chapter/27/>

QUESTIONS SUBMITTED FOR THE RECORD TO MS. ZENA GRECNI, SUSTAINED CLIMATE ASSESSMENT SPECIALIST, EAST-WEST CENTER

Questions Submitted by Representative Sablan

Question 1. Given the recent publication of the PIRCA report for the Northern Mariana Islands (Climate Change in the Commonwealth of the Northern Mariana Islands: Indicators and Considerations for Key Sectors), are there major areas of climate change risk in the Northern Marianas that the draft bill, the Insular Area Climate Change Act, would address?

Answer. The increasing intensity of typhoons and other tropical cyclones is increasing the potential for damage to the CNMP's critical infrastructure. The recent Pacific Islands Regional Climate Assessment report for the CNMI underscored that hardening measures to protect electrical, water, wastewater, and other infrastructure can improve reliability, resilience, and energy and water security. The Insular Area Climate Change Act Section 404 creates grant programs that address vulnerabilities in the electric system with updates to power generation, distribution,

communication, and information systems. These actions will make the electric system more flexible and able to withstand changing conditions and extreme storms. Access to the smart technologies the Act incentivizes can provide real-time communication and offer the power utility better tools to prevent outages and manage restoration efforts. Additionally, Sections 502 and 503 would increase the Environmental Protection Agency's role in coordinating and implementing programs that strengthen infrastructure against disasters. The increased technical assistance to the CNMI will boost efforts to update other systems, including drinking water, septic systems, stormwater systems, and solid waste systems, all of which were compromised by Super Typhoon Yutu and other recent powerful storms. Sections 601 and 602 would increase the ability of communities to recover from major storms by eliminating financial barriers for Territories to seek Federal recovery funds.

The PIRCA report also emphasized that climate-related risks to the global economy are expected to cause large shifts in prices and availability of agricultural, energy, and other goods, potentially leading to food and energy insecurity (Greini et al. 2021; Smith et al. 2018). Provisions of the Act will assist Insular Areas in preparing comprehensive energy plans and facilitate energy efficiency (Sections 401–403) and renewable energy development (especially Sections 404 and 405). These measures will increase resilience to energy price shocks and self-sufficiency of CNMI communities.

The 2013 *CNMI Strategic Energy Plan* identified the precarious state of CNMI's energy security and called for creation of a more comprehensive strategy. Updates to the plan, and its further development, are needed now. The Commonwealth is interested in developing solar and other renewable energy sources to increase resilience and efficiency in the energy and water sectors, reduce greenhouse gas emissions, and lower power costs for residents—called for under its recent *Guidance Manual for Smart, Safe Growth* (CNMI 2018). In 2015, the Commonwealth Utilities Corporation explored various energy options in the planning process for an *Integrated Resources Plan* and issued a Request for Proposals to private companies for power generation projects, including renewable energy. The RFP was later canceled, and the *Plan* remained a draft document. The Insular Area Climate Change Act's comprehensive energy plans will restart energy planning and facilitate studies to assist managers to site renewable energy projects (such as newly available renewable technologies and how climate change may affect the amount and duration of solar exposure and wind speed and direction).

Additionally, the Act will add technical assistance and grants to conduct climate change research and provide information for impact-based decision support (Sections 301–304). This actionable research could support decision-making and solutions for additional areas of climate risk, including: the impact of rising air temperatures and extreme heat on human health; sea level rise threats to transportation, housing, businesses, and critical infrastructure; needed protection for cultural resources and sites; and risks to ecosystems.

Question 2. Besides energy infrastructure, what other types of infrastructure in the insular areas are affected by climate change? What types of support are needed to enable managers to protect infrastructure from the impacts of climate change?

Answer. In the water management sector, we recommend managers and policy-makers consider proactive strategies to mitigate the impacts of drought, sea level rise, and stronger typhoons. Technical assistance is needed to assess the impacts of climate change on surface water and groundwater systems and to identify solutions. Using scenarios and modeling to understand the effects of future conditions on island-specific water budgets can inform water system management. Also helpful is improved water resource monitoring (spatial variation in well fields and salinity levels, for example). Technical capacity-building within local management departments is a way to ensure the skills and resources necessary to support ongoing monitoring and adaptive management. Technologies that augment water supply during times of drought (already periodically impacting Guam and the CNMI) would help residents and business to experience less disruption during dry periods.

The CNMI has a history of management challenges regarding disposal of military, industrial, and municipal solid waste, which in some cases has resulted in contamination of fresh water. Policy-relevant research that supports the provision of safe drinking water to all CNMI communities is needed. Examples of such research include vulnerability assessments of CNMI drinking water supply to both climate and non-climate threats.

Additional technical analysis is needed to evaluate changing hazards for highly vulnerable infrastructure and areas of concern previously identified in local planning and assessment. Decision-makers can utilize the existing vulnerability assessments to explore climate-proofing and relocation options. Climate resilience

infrastructure projects could be piloted on a small scale to demonstrate and support problem-solving.

Question 3. Are there other areas of support needed to address the main challenges of climate change in the region?

Answer. More support is needed to increase the scale of response to meet the many challenges U.S.-Affiliated Pacific Islands face from climate change. I recommend consulting with the local governments and leaders involved in resilience and climate adaptation planning, such as members of the CNMI's interagency Planning and Development Advisory Council who collectively updated the *Resources Report* (CNMI ODP 2020). Several priority areas outlined in the PIRCA report by technical contributors include:

- **Pre-disaster recovery planning**—Pre-planning for disaster recovery can help communities to seize opportunities in the rebuilding and recovery phase and improve resilience to future disasters and climate change. Governments and engineers can account for the risk of future changes in extreme weather in the siting and design of new infrastructure (including buildings, communication and energy systems, transportation, and water and wastewater systems). Guidance is available to local governments and communities on developing pre-disaster recovery plans (see: FEMA 2017 and *Guidance Manual for Smart, Safe Growth*, CNMI 2018). Further support and incentives for pre-disaster recovery planning in the Pacific Island Territories can catalyze rebuilding plans that account for climate change.
- **Ecosystem-based solutions**—Ecosystem-based adaptation remains underutilized as a cost-effective approach for reducing climate risk. Governments need additional technical support and capacity for ecosystem-based adaptation, for example to revegetate coastal areas with mangroves to reduce flooding and erosion, thereby helping to protect coastal communities from storm surge and high winds.
- **Innovative insurance mechanisms**—The risks posed by climate change are too great for individuals, businesses, and local governments in the Pacific Islands to cover on their own. Countries with greater insurance coverage across sectors are found to experience better GDP growth after weather-related catastrophes (Melecky and Raddatz 2011). Thus, making additional insurance options available, such as weather-indexed insurance products and risk transfer-for-adaptation programs, could speed up recovery from extreme events and bolster economies.

Question 4. How can the insular areas best build their respective local capacities to ensure coral reef ecosystems conservation and restoration projects are effectively managed and maintained?

Answer. Scientists and managers identify the need for greatly increasing coral conservation and restoration to reach a meaningful scale. This entails increasing (perhaps doubling or tripling) the funding that CNMI receives for coral reef conservation. It also requires hiring qualified people to implement, manage, and maintain projects. To realize the benefits from investments in coral reef restoration, programs must build local capacity to ensure that the application of new expertise, technology, or tools are sustained.

The need to fund personnel and capacity-building within projects is being increasingly recognized by the funding community. The NOAA Coastal Resilience Grants Program and some other recent awards have included additional personnel and leniency with matching requirements. An expansion of this model across other funding sources would be welcomed in the Pacific Island jurisdictions.

Coral reef conservation and restoration in the Pacific Islands Region would also benefit from more long-term funding periods focusing on partnerships between government and NGOs. Often, projects have 18- to 24-month performance periods for implementation. A small amount of contractual funds may be included for NGOs to provide targeted technical assistance, which is not sustained after a year or so. The short performance periods create challenges to implementing truly impactful conservation and restoration projects. The planning and permitting phases typically consume most project resources. Sustained jurisdictional and regional public-private partnership support across 3- to 5-year timelines should be a primary aim, so that these relationships can be leveraged over the course of multiple discrete projects.

One crucial partner in the effort to restore and conserve vital reef ecosystems may be the U.S. Military due to the scale of mitigation needed to offset defense activities. The Department of Defense appears to have a growing recognition of climate threats and the role that reefs play in coastal defense functions.

Lastly, post-disaster funding for coral reef triage and restoration is becoming widely acknowledged to increase shoreline protection while generating economic benefits. Great progress was made in the Caribbean after Hurricane Maria, where Puerto Rico and the U.S. Virgin Islands were able to include coral reef work under FEMA recovery support functions. While NOAA's Coral Program is in currently initiating an Emergency Coral Response Fund, conservation and restoration in support of nature-based infrastructure could be instituted or codified in other Federal agency priorities for post-disaster recovery.

Question 5. As noted in the PIRCA reports, the coral reef ecosystems in the Pacific insular areas provide hundreds of millions of dollars of economic benefit each year to our island economies. Coral reefs also provide effective natural protection from storm surge and coastal flooding. Unfortunately, widespread bleaching and mortality due to warming sea temperatures have become common occurrences in the region. Can anything be done to protect and restore the precious, vital coral reefs of the insular areas? How does this bill help?

Answer. Widespread coral reef bleaching and mortality is now occurring more frequently, and the future outlook for reefs hinges on near-term global action to cut greenhouse gas emissions. Although conservation efforts can reduce stresses on coral and increase reef resilience to climate impacts, there is growing evidence that major impacts can be avoided only through substantial reductions in the global average atmospheric carbon dioxide concentration.

Nonetheless, reef resiliency does matter. Research in CNMI has identified places that have the greatest potential for reef resilience and thus represent wise investments in conservation and reef restoration (Maynard et al. 2019). Managers are undertaking coral propagation and restoration on high-value reefs. The first pilot projects for structure-building coral propagation (coral nurseries) are being implemented in the Saipan Lagoon in the vicinity of Mañagaha Island.

Examples of projects that are ready to be implemented or scaled up with additional funding, technical assistance, and capacity include:

- both in-situ and ex-situ coral propagation;
- expanding existing in-water coral nursery networks;
- developing a portfolio of coral conservation and restoration options that could function as a “mitigation bank” to offset any unavoidable impacts from U.S. Armed Forces operations in Guam and the CNMI;
- and, enhancing post-disaster response and recovery with measures that restore corals and other natural infrastructure that provide substantial protection from extreme storms.

The Insular Area Climate Change Act would remove a barrier to obtaining funding for coral management and monitoring under the Coral Reef Conservation Act of 2000 by waiving the matching requirement for Insular Areas. It would also add Coral Reef Prize Competitions (Section 103) managed by the Office of Science and Technology Policy that would inject needed funds to scale up coral reef conservation, restoration, and research. Through this Act and growth in capacity-building programs, the Pacific Islands Region can become a leader in providing job growth in coral management and secure a livable future for communities.

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Questions Submitted by Representative DeGette

Background

Rep. DeGette’s Clean Energy Innovation and Deployment Act includes a provision (Section 130 of H.R. 7516 in the 116th Congress) that may be of great benefit to people living in U.S. territories, as well as on islands and in remote areas worldwide.

The provision would require the Department of Energy (DOE) to establish a certification program for electricity-related technologies for use in remote communities. Companies whose products were certified could use that fact in marketing the technologies, much as do the recipients of DOE’s Energy Star label. Facilitating the deployment of these technologies would make modern electricity services more affordable, reliable, and resilient to households in remote areas, and reduce demand for expensive imported fossil fuel-generated electricity and the associated carbon emissions.

Qualifying technologies would include those that can generate electricity off-grid (such as solar panels), those that store energy, and highly efficient appliances, including lights, cell-phone chargers, computers, fans, refrigerators, stoves and ovens. DOE would only certify a technology determined to function properly; generate no greenhouse gas emissions; be affordable, reliable, durable, safe, and protective of human health and the environment; be compatible with other technologies relevant to its functioning, including those which have been similarly certified; and be available for deployment at commercial-scale throughout the territories and states of the United States.

There is already a market for these kinds of technologies, especially in developing countries, but many of the products being marketed today do not work well, are sold on the basis of fraudulent claims, or are not compatible with adjacent technologies (for example, a solar panel not being compatible with a battery). Rep. DeGette’s measure would make DOE the validator of these technologies, thus driving their innovation, increasing their quality, protecting consumers in the United States and globally, and facilitating the deployment of affordable reliable resilient climate-friendly technologies to communities in the United States, and around the world, that need them the most.

Question 1. In addition to being on the front lines of climate change, are communities on your islands paying much higher electricity rates due to the fact that most electricity is generated from imported, expensive, and, in many cases, polluting fossil fuels?

Answer. Yes, the high price of fossil fuel electricity places an undue burden on low-income, remote Pacific Island communities. The Pacific Island Territories (American Samoa, the Commonwealth of the Northern Mariana Islands [CNMI], and Guam) are almost entirely dependent on fossil fuels to meet their electricity generation needs, and oil is imported at high shipping rates and prices. (Guam, the CNMI, and American Samoa are each more than 5,000 miles from the Continental U.S.)

Electricity prices for residents in the Pacific Island Territories are above the U.S. average. American Samoa’s electricity rate for residential customers is \$0.33 USD per kilowatt-hour (kWh); CNMI’s residential rates are \$0.21 to \$0.35 USD/kWh; and Guam’s residential rate is \$0.20 USD/kWh (NREL 2020a, b, & c). All are well above the \$0.13 USD/kWh average U.S. residential rate. Residents in American Samoa pay more than double the U.S. average rate, while median household income is much lower than for the U.S. as a whole (52% lower at the last Census in 2009).

The CNMI has a median household income below that of any U.S. state (at \$19,958 in 2009).

While the Pacific Island Territories have no natural oil reserves, they have abundant sun and wind resources that can play a major role in meeting their energy needs (Baring-Gould et al. 2011a & b; Busche et al. 2011). Renewable energy generation sources are becoming increasingly cost competitive with an expanding market share for solar and wind energy.

Question 2. Are the electric grids on your islands vulnerable to disruption by the effects of climate change, in particular increasing storm intensity, water cycle disruption, average temperatures, and sea level rise?

Answer. Yes, on Pacific Islands, the majority of infrastructure and communities lie along the coast near sea level and are exposed to sea level rise and increasingly powerful storms. Extreme weather events in recent years have exposed a high degree of vulnerability of electrical grids and supply infrastructure. In 2018, Super Typhoon Yutu, a Category 5 cyclone, was the strongest typhoon ever recorded to impact the Mariana Islands. Super Typhoon Yutu damaged or destroyed significant portions of buildings and critical infrastructure in the CNMI, causing widespread power outages. While recent updates by FEMA and the Commonwealth Utilities Corporation have “storm-proofed” and improved some electric infrastructure in Saipan’s integrated system (consisting of three diesel generation facilities and an integrated grid), other parts of the grid remain under-protected. The CNMI’s infrastructure has been described as a patchwork of systems, with coverage, reliability, and modernization varying across different villages and sections of the island (Greene and Skeele 2014). Temporary blackouts are not uncommon when power levels are lower than normal or when weather disrupts areas of service.

Sea level rise presents major risks for electrical supply infrastructure. For example, Saipan’s primary electricity generation plant is in a FEMA flood zone and within the zone exposed under the CNMI Coastal Management Program’s sea level rise planning scenario (Greene et al. 2021). Temporary flooding from a 10-year storm event combined with sea level rise by mid-century (under a business-as-usual scenario) would inundate all access routes to the main power plant and the plant itself (Green and Skeele 2014).

The CNMI’s seaport facilities (where fuel shipments are received) face challenges as well. The Port of Saipan complex is particularly exposed to waves and storm surge during swell and storms, with the channel and docking facilities oriented toward the exposed west-southwest (Greene and Skeele 2014).

On Guam, electrical generation and transmission systems are similarly exposed to sea level rise and storm inundation. The commercial sector (including hotels, restaurants, and commercial buildings) consumes more than one-third of Guam’s electricity, while the U.S. Military accounts for one-fifth of Guam’s electricity consumption. Guam’s petroleum used for energy is mostly imported from Asian countries (US EIA 2021). Thus, risks to global energy supply chains and expected climate change impacts pose a threat to Guam’s economy as well as U.S. defense installations.

Question 3. Do you believe this puts an additional and unnecessary financial strain on those living on your islands?

Answer. According to the U.S. Fourth National Climate Assessment, climate change is anticipated to lead to large-scale shifts in the availability and prices of energy, with impacts on the U.S. economy (Smith et al. 2018). Given their nearly complete reliance on high-cost imports of fuel for their energy needs, islands are vulnerable to global price shocks and energy shortages that may result from climate change and extreme weather.

The cost burden is already high for residents (see response to Question 1), and climate change adds volatility to the cost of electricity. At the last Census, income levels in the Pacific Island Territories were low in comparison to the U.S. as a whole.

The COVID-19 pandemic and its enormous impact to tourism, devastating the islands’ economies in the past year. This additional loss of income further creates the situation for energy price increases to harm people in the Pacific Islands.

Question 4. Given that, do you think there might be a market on your islands for affordable reliable resilient equipment to generate and use zero-emitting electricity, reducing dependence on expensive fossil fuels and the vulnerable electric grid?

Answer. Yes, provided technologies are very affordable or can be funded through low-cost loans or grant programs. A similar program, the Energy-Efficient Appliance Rebate Program that provides funding to assist residents to reduce their energy

consumption by purchasing energy efficient appliances, has been successful in the Pacific Island Territories. With the potential for growth in energy demand due to the anticipated U.S. Military build-up and the need for increased economic self-reliance, the Pacific Island Territories could represent a market for zero-emitting appliances and technologies.

Question 5. Do you think certification of this kind of equipment by the U.S. Department of Energy, as described in the Background section, would increase consumer confidence in it and thereby promote its use on your islands?

Answer. The cost of technologies may be a larger factor than certifications in decisions for many consumers. However, the use of technologies by government, U.S. Military, and some private sector consumers may increase from the boost in confidence that comes with U.S. Department of Energy certification.

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Questions Submitted by Representative Graves

Question 1. I am concerned that the creation of new Federal programs may result in duplication with existing programs, diluting funding availability and potential impacts. Are existing programs failing to meet these needs? If so, could they be reformed to better support current inadequacies? Please provide specific examples.

Answer. The Insular Area Climate Change Act will add vital increased support for existing programs and fill certain important gaps for U.S. Pacific Island Insular Areas. Addressing energy planning needs with support from the Department of Energy specifically for insular areas will better direct, coordinate, and fund energy programs that are not sufficiently supported to achieve comprehensive planning and management. (For example, comprehensive energy planning for the CNMI by the Commonwealth Utilities Corporation started in 2015 but later stalled due to

disaster recovery and the need for technical assistance.) Also, the creation of the Climate Change Insular Research Grant Program within NOAA would expand critical climate monitoring by providing grants to institutions of higher education and research entities. This is much needed in a region that lacks fine-scale climate projections and has only a few climate datasets suitable for understanding climate and the shifts taking place.

Some federally sponsored regional programs not covered in the draft bill are successful and currently provide effective support to governments and managers to address climate risk. These programs could be expanded with further funding and include:

- The **NOAA Regional Integrated Sciences and Assessments (RISA)** program supports 11 RISA teams in regions across the U.S. that help expand and build the nation's capacity to prepare for and adapt to climate variability and change. I work as Sustained Climate Assessment Specialist at one RISA team, the Pacific RISA, which serves Hawaii and the U.S.-Affiliated Pacific Islands. We partner with public- and private-sector user communities to provide innovative services, products, and tools to enhance the use of science in climate-related decision-making.
- The **National Climate Adaptation Science Centers (NCASC)**, funded by the Department of the Interior and managed by the USGS, currently disseminate Federal funding for academic research that can be applied in local management decisions. We coordinate and partner with the Pacific Island Climate Adaptation Science Center, a consortium that includes the University of Hawaii and the University of Guam.
- The **U.S. Global Change Research Program (USGCRP)** coordinates a quadrennial assessment of climate risk to the U.S. economy, key sectors, and the environment. Some reporting requirements of the bill might be more efficiently accomplished if done as part of assessments that USGCRP coordinates.

Question 2. Insular areas are unique in many ways, including energy. These areas are largely dependent on imports for energy—resulting in high costs, reduced energy security and vulnerability to supply chain disruption. Distributed generation and renewables are a very good fit for the natural resource availability of many of these areas. However, my concern is that the Federal Government would be mandating a singular approach. Even if you were to dramatically increase renewables, does it make sense to keep the door open for other energy options?

Answer. I would not advocate an approach that rules out any viable, resilient energy strategy, especially in a region that is so vulnerable to acute and chronic stressors. The Insular Area Climate Change Act in no way precludes any option that may assist in the transition away from carbon-based fuel sources, however specific support for renewable energy is needed. The Pacific Islands lag most U.S. States in renewable energy development and the new jobs that it creates. Without the involvement of Federal programs and support, comprehensive energy planning, research, and development may further stall in U.S. Pacific Island Territories, as they struggle to recover from the collapse of tourism, the main economic driver.

The costs of continued reliance on fossil fuels for islands go beyond reduced energy security and risk of supply chain disruptions. While issues associated with importing energy sources do leave islands in a precarious position, the impacts of climate change uniquely threaten islands, and some islands may even cease to exist. This situation makes the global transition to renewable, low-emission energy sources urgent. Islands can be hubs of innovation for sustainable, resilient energy systems, providing useful experience for the energy and utilities industry throughout the United States.

Question 3. A primary reason for a government mandates is that a desired outcome does not make financial sense over the long term. Is that the case—would renewable energy be more expensive over the long term? If not, what is the benefit of having the Federal Government impose such mandates (if it potentially ties the hands of these areas should a better option come along in the future)?

Answer. The Act's proposed Office of Insular Area Energy Policy (Section 401) and Comprehensive Energy Plans (Section 402) would involve comprehensive review of energy costs in the Territories, with the mandate to "reduce or stabilize energy costs in the Insular Areas" (page 15, lines 18–19). I see no mandate in the draft Insular Area Climate Change Act that would exclude any energy source. Rather, the Act calls for a comprehensive look at the initial, current, and future planned sources of energy, including both renewable and imported sources.

Renewable energy has become more cost competitive as its use has grown. However, further incentives are needed in island areas where resources for new capital investments are limited. Jobs in the renewable energy sector have also seen tremendous growth in the past decade, and the Act would enable the Insular Areas to access this job growth. Recent figures show renewable energy employs about 850,000 people in the U.S. (not including some 2.3 million jobs in energy efficiency). Wind turbine service technician is a fast-growing occupation according to the U.S. Bureau of Labor Statistics.

Energy security is critical to the Pacific Islands' future economic development and sustainability. A trained workforce to develop and expand energy industries and energy-efficient technologies will play a critical role in achieving economic stability for the Pacific Islands.

The CHAIRMAN. Thank you very much. I appreciate your testimony.

Let me now ask Dr. Austin Shelton, Director, University of Guam Center for Island Sustainability, for your comments.

Doctor, the floor is yours.

STATEMENT OF AUSTIN SHELTON, PH.D., DIRECTOR, CENTER FOR ISLAND SUSTAINABILITY, UNIVERSITY OF GUAM, MANGILAO, GUAM

Dr. SHELTON. Chairman Grijalva, Ranking Member Westerman, and distinguished members of the Committee, hafa adai. My name is Austin Shelton, and I am a marine and environmental scientist serving as the Director of the University of Guam Center for Island Sustainability and Guam Sea Grant and also co-chair of the U.S. Climate Strong Islands Network.

Instead of heavy climate statistics and data, which I am sure my fellow witnesses and I are submitting to you all in writing, I would like to start off with some counterintuitive thoughts about islands.

Under the weight of climate change impacts, biodiversity loss, debilitating storms, and swallowing seas, islands are not sinking. Strong and resilient, islands are rising.

Traditional celestial navigators remind the world that islands were never isolated. Oceans connected us for millennia. Now, a vast network of undersea fiber optic cables make islands some of the most digitally connected places in the world. While the pandemic dictates that we plant our feet one place on the ground, we connect across the planet here on screens to share glimpses of what a brighter future could look like.

Islands are rising.

Since the start of nonindigenous colonial periods, islands suffered high rates of chronic conditions and communicable diseases. Now, during the most challenging global health pandemic, islands are among the safest places in the world.

Islands are rising.

I would like to thank Chairman Grijalva for introducing this legislation and thank the Members for considering the critical support it would provide for climate change planning, mitigation, and adaptation in U.S. island territories and Freely Associated States.

The University of Guam Center for Island Sustainability was established in 2009 to lead and support the transition of our island region toward a sustainable future, and our center fully supports the legislation and is pleased to offer comments.

Echoing my fellow witnesses, climate change impacts to our nation are disproportionate. Islands contribute the least to the causes of climate change, yet we experience the brunt of its impacts, in the form of frequent and severe storm events, droughts, flooding, and coral bleaching. Islands are victims and we are suffering, but we also have lots of knowledge and innovations to share as bright spots for the nation in the fight against climate change.

That is why I say to you that islands are rising. It is the theme of our upcoming University of Guam Conference on Island Sustainability, which last year brought together thousands of islanders from around the globe virtually.

And one island innovation example that we learned through the conference network last year was solar schools in Puerto Rico. Following Hurricanes Irma and Maria, over 100 schools were equipped with solar PV and battery storage. The project can serve as a roadmap to resilience for other island communities that we would love to follow in Guam with the resources to be provided through this legislation.

After disasters, schools become community shelters and command centers. Right now, schools are COVID-19 testing, vaccination, and food distribution sites. Upgrading school infrastructure with solar photovoltaics and battery storage will greatly improve resilience, as electricity is often wiped out for weeks or months following a disaster.

Guam recently took a few big steps toward achieving a sustainable future, and we would be ready to take advantage of new opportunities provided through this legislation.

In November 2019, Guam Public Law 35–46 was signed, mandating 50 percent renewable energy production for the island by 2035 and 100 percent by 2045.

In September 2020, the Guam Green Growth Action Framework was formally adopted by the Governor of Guam, Lourdes Leon Guerrero. The initiative aligns with the 17 United Nations Sustainable Development Goals, serving as our island's most comprehensive action plan ever created to achieve a sustainable future. U.N. Sustainable Development Goal 13, climate action, is a common thread through the whole framework.

A Guam Coral Reef Resilience Strategy and Guam Climate Change Resilience Commission were also recently formed. And thanks to the Pacific Island's Regional Climate Assessment in Zena's presentation, we know what climate impacts are here and on the way. With our island's initiatives in place and priorities identified, Guam is ready to hit the ground running with technical assistance and infrastructure development upon passage of this legislation.

The University of Guam Center for Island Sustainability implements climate actions and serves as a convener of local, regional, and global partners. In solidarity, islands are uniting in common purpose through the Local2030 Islands Network, Climate Strong Islands Network, and other organizations to act on climate.

Islands are distant, but they are not alone. Together, islands are rising.

Si yu'os ma'ase, and thank you for the opportunity to testify.

[The prepared statement of Dr. Shelton follows:]

PREPARED STATEMENT OF AUSTIN J. SHELTON, PH.D., DIRECTOR AND ASSISTANT PROFESSOR, UNIVERSITY OF GUAM CENTER FOR ISLAND SUSTAINABILITY AND SEA GRANT

Hafa Adai. My name is Austin Shelton, and I am a marine and environmental scientist serving as the director of the University of Guam Center for Island Sustainability and Guam Sea Grant.

I would like to start off with some counterintuitive thoughts about islands.

ISLANDS ARE RISING

Under the weight of climate change impacts—biodiversity loss, debilitating storms, and swallowing seas— islands are not sinking. Strong and resilient, islands are rising.

Traditional celestial navigators remind the world that islands were never isolated. Oceans connected us for millennia. Now, a vast network of undersea fiberoptic cables make islands some of the most digitally connected places in the world. While the pandemic dictates that we plant our feet one place on the ground, we connect across the planet here on screens to share glimpses of what a brighter tomorrow could look like. Islands Are Rising.

Since the start of non-indigenous colonial periods, islands suffered high rates of chronic conditions and communicable diseases. During the most challenging global health pandemic, islands are among the safest places in the world. Islands Are Rising.

I would like to thank Chairman Grijalva for introducing this legislation and thank the members for considering the critical support it would provide for climate change planning, mitigation, and adaptation in U.S. island territories and Freely Associated States. The University of Guam Center for Island Sustainability was established in 2009 to lead and support the transition of our island region toward a sustainable future. Our center fully supports the legislation and is pleased to offer comments.

Climate change impacts to our nation are disproportionate. Islands contribute the least to the causes of climate change, yet we experience the brunt of its impacts in the form of frequent and severe storm events, droughts, flooding, and coral bleaching. Islands are victims and we're suffering, but we also have lots of knowledge and innovations to share as bright spots for the nation in the fight against climate change.

That is why I say to you that Islands Are Rising. It's the theme of our upcoming University of Guam Conference on Island Sustainability April 5–9, 2021, which last year, brought together thousands of islanders from around the globe virtually (over 16,000 on Zoom and social media from 80 countries, states, and territories).

One island innovation example learned through the conference network was solar schools in Puerto Rico. Following Hurricanes Irma and Maria, Blue Planet Energy equipped over 100 schools with solar energy and battery storage. The project can serve as a roadmap to resiliency for other island communities that we would love to follow in Guam with the resources to be provided through this legislation. After disasters, schools become community shelters and command centers. Right now, schools are COVID-19 testing, vaccination, and food distribution sites. Upgrading school infrastructure with solar photovoltaics and battery storage will greatly improve resilience as electricity is often wiped out for weeks or months following a disaster.

ENERGY AND SUSTAINABILITY POLICIES AND INITIATIVES

Guam recently took a few big steps toward achieving a sustainable future, and we would be ready to take advantage of new opportunities provided through this legislation. In November 2019, Guam Public Law 35–46 was signed, mandating 50% renewable energy production for the island by 2035 and 100% by 2045.

The Guam Green Growth (G3) Initiative is the most comprehensive public-private partnership ever created to achieve a sustainable future for our island. Executive Order 2019–23 brought together 97 working group members representing all sectors of society to create the Guam Green Growth Action Framework. The executive order assigned our Center for Island Sustainability to facilitate G3. Formally adopted by Governor Lourdes A. Leon Guerrero and Lt. Governor Joshua F. Tenorio in September 2020, the G3 Action Framework guides implementation of the 17 United Nations Sustainable Development Goals in locally and culturally effective ways. U.N. SDG 13 Climate Action is a common thread through the whole framework. While G3 drives local action, it also places Guam at the global forefront of leadership in island sustainability. Guam is a founding member of the Local2030 Islands Network, through which islanders scale innovative, values-based, and resilient

sustainability solutions worldwide. The G3 Action Framework is focused on five categories of action—1) Healthy and Prosperous Communities; 2) Educated, Capable, and Compassionate Island; 3) Sustainable Homes, Utilities, and Transportation; 4) Thriving Natural Resources; and 5) Sustainable Alliances. Cross-cutting elements are incorporated into all categories—climate action, resilience, public engagement, policy, and the core CHamorú values of respect, cooperation and treating others with kindness, generosity, and dignity.

The Guam Coral Reef Resilience Strategy (GRRS) was adopted in 2018. The goal of the GRRS is to enhance the resilience of Guam’s coral reef ecosystems and human communities to the impacts of climate change by 2025. The GRRS is a tool for adaptive, strategic management; an opportunity to engage and inform key stakeholders; a mechanism to increase effectiveness of coral reef management; and a guide for funding projects designed to reach a common goal. The Guam Climate Change Resiliency Commission was formed in 2019. It is the objective of the commission to develop an integrated strategy to build resiliency against the adverse effects of climate change and to reduce contributing factors such as greenhouse emissions. Goals from both the GRRS and the Guam Climate Change Resiliency Commission are integrated into the G3 Action Framework.

FUNDING CONSIDERATIONS

With our initiatives in place and priorities identified, Guam is ready to hit the ground running with technical assistance and infrastructure development upon passage of this legislation. However, non-federal cost sharing should not be a barrier to action on climate change. The Sec. 102 Non-Federal Cost Share Waiver provision to increase the waiver to \$750,000 for territories would greatly increase the ability of islands to implement climate action projects. Though we have the scientific and institutional capacity to make significant impacts with additional federal funds, we often need to scale back grant proposal plans because local funds are limited and often tied up for other federal matching requirements. An increased match waiver would greatly expand our capabilities and allow islands to leverage and maximize other federal investments.

The legislation’s appropriations to NOAA for increased climate change, coastal management, and ocean and coastal mapping are most welcome. Please also consider additional appropriations to NOAA for the National Sea Grant College Program to achieve equity for insular areas. The National Sea Grant College Program enhances the practical use and conservation of coastal, marine and Great Lakes resources in order to create a sustainable economy and environment. Puerto Rico is currently the only U.S. territory with a full-status Sea Grant College Program. I serve as the director of the Guam Sea Grant Coherent Area Program, and we will soon undergo a review for Institutional Status to increase our base funding. CNMI, American Samoa, USVI, and the Freely Associated States do not have their own Sea Grant Programs.

The world is at the cusp of a green industrial revolution with the unfolding of new technological advances in 5G Internet, renewable energy, and emission-free transportation. In addition to climate change planning and research, U.S. island territories and the FAS urgently need assistance with the build-out of infrastructure to make a swift transition into the new green industrial revolution. The proposed provisions for renewable energy and sustainable infrastructure grant will support new green jobs, increase climate resilience, and lower fossil-fuel emissions.

ISLAND PARTNERS

The University of Guam Center for Island Sustainability implements climate actions and serves as a convener of local, regional, and global partners. In solidarity, islands are uniting in common purpose through the Local2030 Islands Network, U.S. Climate Strong Islands Network, and other organizations to act on climate. I suggest adding representatives of these networks in a member or advisory capacity to the Insular Area Climate Change Interagency Task Force in Sec. 101.

Islands are distant, but they are not alone. Together, **Islands Are Rising.**

Si Yu’os Ma’ase and thank you for introducing this legislation and providing me the opportunity to testify.

QUESTIONS SUBMITTED FOR THE RECORD TO DR. AUSTIN SHELTON, DIRECTOR,
UNIVERSITY OF GUAM, CENTER FOR ISLAND SUSTAINABILITY

Questions Submitted by Representative Sablan

Question 1. Widespread bleaching and mortality due to warming sea temperatures have become common occurrences in the region. Can anything be done to protect and restore the precious, vital coral reefs of the insular areas? How does this bill help?

Answer. Coral reefs provide immense ecological, economical, and cultural benefits to islands. Guam and the CNMI are home to the most diverse coral reefs in the United States, with more species of coral than Hawaii and the entire Caribbean combined. Bleaching killed 34% of Guam's coral reefs between 2013–2017, and it was likely similar in the CNMI. In order to end widespread bleaching and mortality before coral reefs are completely decimated, the U.S. and global community must rapidly reach net zero carbon emissions. While new national policies and global accords work to achieve carbon neutrality, funding to improve coral resilience is essential.

Resilience is achieved through direct actions taken to reduce local environmental stressors, such as coastal pollution, nutrient loading, and land erosion and subsequent sedimentation on coral reefs. This bill states that coral reef prize competitions should be established in federal agencies, but it is unclear whether new funding sources will be appropriated for these purposes or take funding from other programs. The proposed local matching funds waiver will be helpful to increase local access to federal funds in insular areas, but new large investments for coral resilience are also needed. For example, the majority of current funding from the NOAA Coral Reef Conservation Program is used only for U.S. Coral Reef Task Force Priority Sites, which is a very small percentage of total coastal area in the insular areas. This leaves the majority of the local environmental stressors in the rest of island territories and FAS often completely neglected.

Any new funds for coral resilience that this legislation may provide should go directly to natural resource agencies, non-governmental organizations, and institutions of higher learning based in insular areas. Islands should not have to compete with institutions in continental states for coral resilience funds.

Question 2. How can the insular areas best build their respective local capacities to ensure coral reef ecosystems conservation and restoration projects are effectively managed and maintained?

Answer. An increase in funding from the NOAA Coral Reef Conservation Program, DOI Office of Insular Affairs Coral Reef Initiative, US EPA, etc. to create more positions at local government natural resource agencies will ensure better management and maintenance of coral reef conservation and restoration projects.

Local capacity of trained individuals can be increased with more funding for place-based K-12 environmental education and STEM pathway funding for colleges and universities. National Science Foundation EPSCoR and INCLUDES programs are providing over 100 opportunities for local students in marine and environmental students in Guam over the next few years. Increased funding to programs such as these should be considered.

University of Guam Sea Grant is providing some additional research and student opportunities each year. Equitable funding to all territories and FAS from the National Sea Grant College Program should be considered. As mentioned in my earlier written testimony, only Puerto Rico is the only insular area that has a full-status Sea Grant College Program. Guam is two steps behind with only a Sea Grant Coherent Area Program. CNMI, American Samoa, USVI, and all the FAS lack their own Sea Grant Programs. A \$2 million investment per year for each territory and FAS could provide for full Sea Grant College Programs in all insular areas. This would provide critical research, extension, and education services for islands on the frontlines of climate impacts such as coral bleaching.

Questions Submitted by Representative DeGette

Background

Rep. DeGette's Clean Energy Innovation and Deployment Act includes a provision (Section 130 of H.R. 7516 in the 116th Congress) that may be of great benefit to people living in U.S. territories, as well as on islands and in remote areas worldwide.

The provision would require the Department of Energy (DOE) to establish a certification program for electricity-related technologies for use in remote communities. Companies whose products were certified could use that fact in marketing

the technologies, much as do the recipients of DOE's Energy Star label. Facilitating the deployment of these technologies would make modern electricity services more affordable, reliable, and resilient to households in remote areas, and reduce demand for expensive imported fossil fuel-generated electricity and the associated carbon emissions.

Qualifying technologies would include those that can generate electricity off-grid (such as solar panels), those that store energy, and highly efficient appliances, including lights, cell-phone chargers, computers, fans, refrigerators, stoves and ovens. DOE would only certify a technology determined to function properly; generate no greenhouse gas emissions; be affordable, reliable, durable, safe, and protective of human health and the environment; be compatible with other technologies relevant to its functioning, including those which have been similarly certified; and be available for deployment at commercial-scale throughout the territories and states of the United States.

There is already a market for these kinds of technologies, especially in developing countries, but many of the products being marketed today do not work well, are sold on the basis of fraudulent claims, or are not compatible with adjacent technologies (for example, a solar panel not being compatible with a battery). Rep. DeGette's measure would make DOE the validator of these technologies, thus driving their innovation, increasing their quality, protecting consumers in the United States and globally, and facilitating the deployment of affordable reliable resilient climate-friendly technologies to communities in the United States, and around the world, that need them the most.

Question 1. In addition to being on the front lines of climate change, are communities on your islands paying much higher electricity rates due to the fact that most electricity is generated from imported, expensive, and, in many cases, polluting fossil fuels?

Answer. Guam's rate of electricity per kwh is on the lower end compared to other islands in the Pacific (https://guamccu.org/wp-content/uploads/2020/12/gpa_ar_2019.pdf). Imported diesel is what fuels most of the energy demand, and the Public Utilities Commission just authorized the building of a new 180MW diesel burning powerplant. While the current dollar cost is not currently alarming, we will be in a precarious situation for decades to come with continued reliance on imported fossil fuels and its global price fluctuations instead of capturing more renewable sources of energy.

Question 2. Are the electric grids on your islands vulnerable to disruption by the effects of climate change, in particular increasing storm intensity, water cycle disruption, average temperatures, and sea level rise?

Answer. Yes, Guam's electric grid is vulnerable to disruptions. Residents can lose electricity for weeks or months following storms, which is predicted to be more frequent and severe due to climate change. Most power lines are above ground and exposed to high winds adding to the vulnerability. Existing power plants are located at sea level, close to the coastline.

Question 3. Do you believe this puts an additional and unnecessary financial strain on those living on your islands?

Answer. Yes, the vulnerability of the electric grids adds to electricity costs of island residents.

Question 4. Given that, do you think there might be a market on your islands for affordable reliable resilient equipment to generate and use zero-emitting electricity, reducing dependence on expensive fossil fuels and the vulnerable electric grid?

Answer. Yes, more resilient, zero-carbon-emitting technology would certainly be welcomed to reduce vulnerability and reliability on fossil fuels. Guam's Governor signed a 100% renewable energy by 2045 mandate into law in 2019. It is the first law of its kind in any U.S. territory. We need all the support possible from Federal policies and programs to help us achieve the ambitious mandate.

Question 5. Do you think certification of this kind of equipment by the U.S. Department of Energy, as described in the Background section, would increase consumer confidence in it and thereby promote its use on your islands?

Answer. The certification program will be helpful. However, individual consumer purchasing of appliances will not be enough to reach zero-emissions by 2050. Along with the certificate program, federal policies should provide further incentives to ensure adoption of the new technologies by local power agencies and commissions.

Questions Submitted by Representative Graves

Question 1. I am concerned that the creation of new Federal programs may result in duplication with existing programs, diluting funding availability and potential impacts. Are existing programs failing to meet these needs? If so, could they be reformed to better support current inadequacies? Please provide specific examples.

Answer. U.S. island territories and Freely Associated States are on the frontlines of climate change-generated natural disasters and impacts. Existing federal programs are inadequate to achieve the impact necessary to address the current and future threats to communities, infrastructure, and natural resources. For example, current funding from the NOAA Coral Reef Conservation Program is extremely limited and only used for U.S. Coral Reef Task Force Priority Sites, which is a very small percentage of island coastal areas. This leaves the majority of the local environmental stressors in the rest of island territories and FAS often completely neglected. Significantly larger and dedicated investments to island infrastructure and natural resources is the reform needed, and this proposed legislation is helping to address that.

Question 2. Insular areas are unique in many ways, including energy. These areas are largely dependent on imports for energy—resulting in high costs, reduced energy security and vulnerability to supply chain disruption. Distributed generation and renewables are a very good fit for the natural resource availability of many of these areas. However, my concern is that the Federal Government would be mandating a singular approach. Even if you were to dramatically increase renewables, does it make sense to keep the door open for other energy options?

Answer. In my understanding of the legislation, the door is not closed to existing energy options. This legislation helps shift dependence on imported fossil fuels to local, renewable energy production. Every dollar spent on imported fossil fuels (which mostly come from Singapore in Guam's case) is a dollar exported from the local economy of the U.S. territory. The shift to local renewable energy production is critical for providing energy resilience and cost-savings to island communities.

Question 3. A primary reason for a government mandates is that a desired outcome does not make financial sense over the long term. Is that the case—would renewable energy be more expensive over the long term? If not, what is the benefit of having the Federal Government impose such mandates (if it potentially ties the hands of these areas should a better option come along in the future)?

Answer. No, renewable energy will not be more expensive over the long term. Renewable energy will save money over the long term. Renewable energy production in Guam will allow locally generated dollars, along with federal aid provided to the territory, to remain in the local economy instead of being sent off to Asia for the importation of fossil fuels. A rapid shift to renewable energy today will also avoid future infrastructure repair expenses. If carbon emissions continue, islands will experience more climate-related impacts, such as severe storms and rising seas. Because of the cost of future infrastructure repairs, any dollar we think we're saving today with fossil fuels, is really just stealing from our future generations.

The CHAIRMAN. Thank you very much, Doctor.

Let me return to Commissioner Oriol from the U.S. Virgin Islands Department of Planning and Resources—the technical difficulties have been dealt with—to finish his testimony that he was unable to do so at that time.

Mr. ORIOL. Thank you, Chairman Grijalva. And thank you for allowing me to navigate through these small island issues that we have down here.

I will just return to page 4 of my testimony.

The U.S. Virgin Islands is very supportive of the coral reef prize competition authorized under Title I, Section 103 of the bill. As the Caribbean Islands are faced with battling the effects of the stony coral tissue loss disease and the Pacific Islands are increasing efforts for restoration in response to the 50 percent loss of coral in the last 6 years due to bleaching, awarding funds supporting

innovative ideas for research and conservation in the insular areas will provide a great benefit for the management of coral reef ecosystems.

The USVI would ask that the language also include restoration in addition to research and conservation, as we work with partners in more active management for coastal coral reef ecosystems that protect our coasts and service the community with our food, economy, and quality of life.

Coastal water quality is both a human health and natural resource management issue that will be significantly impacted by climate change. Climate will impact available drinking water and pose increased risks from stormwater discharge. Funding should be earmarked to upgrade the infrastructure to ensure adequate drinking water supply and effectively manage the volume and quality of ocean discharge from stormwater to protect coastal coral reef ecosystems.

Under Title IV, Section 405, as it relates to the opportunities for the development of offshore wind, the USVI would ask that consideration for the language to include wave energy production be included. The monitoring buoys, to include those that are part of the Integrated Ocean Observing System, suggest that there is great potential for wave energy generations in the U.S. Virgin Islands. This potential may exist beyond the territorial limits of the USVI in the U.S. EEZ, and, as such, we would not want to limit the potential for research and investment only to wind production.

As it relates to Title V, Section 503, for the development of an insular area sustainable infrastructure grant program, again, we highlight the significant amount of funding associated with this program which would allow the islands to make significant improvements to the infrastructure systems.

We would ask that language also be considered such that each insular area receive assistance from FEMA to standardize the hazard mitigation package that will be used to respond and to restore coastal natural resource loss after future natural disasters to maintain coastal protection rather than such loss being on a case-by-case basis.

Lastly, on behalf of the insular family, I would like to thank the bill sponsor for language in Title I, Section 102, that proposes increasing the cost-share match waiver from \$200,000 to \$750,000, as well as the many sections calling for the waiving of the match requirement for the different programs. This would not only impact our programs covered under this bill but across many of our territorial programs altogether.

In conclusion, I would like to thank you, Mr. Chair, and the members of the Committee for the opportunity to address the proposed Insular Area Climate Change Act. There are many benefits to the people of the insular areas and territories that can be realized from the passage of this bill.

This comprehensive strategy to address climate impacts to the islands will result not only in improvement of our natural and built systems but will also improve our economic, social, and cultural systems as well, providing a sound legacy for future generations. We look forward to Congress' favorable consideration of this bill.

Thank you very much.

[The prepared statement of Mr. Oriol follows:]

PREPARED STATEMENT OF MR. JEAN-PIERRE L. ORIOL, COMMISSIONER, DEPARTMENT OF PLANNING AND NATURAL RESOURCES, GOVERNMENT OF THE UNITED STATES VIRGIN ISLANDS

Thank you Representative Grijalva for the opportunity to testify in support of the proposed “Insular Areas Climate Change Act” on behalf of the US Virgin Islands. Whether it is the 2015 federally-declared disaster for drought in the US Caribbean, the impact of Hurricanes Irma and Maria to Puerto Rico and the US Virgin Islands in 2017, and Tropical Cyclone Gita in American Samoa or Super Typhoon Yutu in the Mariana Islands in 2018—the people of the Insular Areas and the Territories of the United States are no strangers to damaging events associated with climate change. Our islands make minimal contributions to greenhouse gas emissions, yet they are experiencing overwhelming ecological, economic and cultural impacts from global climate change, which will dramatically increase over the next several decades. The combined effects of sea level rise, ocean acidification, increased storm intensity and frequency, significant changes in rainfall, coral bleaching, and temperature-induced changes in the distribution of ocean productivity and fisheries are of great concern to all of the Insular Areas, and require addressing infrastructure improvements as well as sustainability and climate change adaptation planning.

Addressing climate change in an effective and timely manner is one of the most pressing challenges where sound environmental policy is also the best economic policy, and addresses key quality of life issues for present and future generations. For the US Virgin Islands, as we recover from the devastation suffered from two Category 5 hurricanes, we are focused on incorporating long-term resilience into our everyday way of life. The US Virgin Islands is involved in several initiatives related to assessing the impacts from climate change on our Territory. In conjunction with the University of the Virgin Islands, using funding from NOAA’s Office for Coastal Management, the VI’s Coastal Zone Management Program is developing a Coastal Vulnerability Index which will identify our susceptibility to different climate-related events such as sea-level rise, tsunamis, storm surge, drought, coastal flooding and coastal erosion; DOI’s Office of Insular Areas has provided funding to the Territory through its Coral Reef Initiative to install ocean acidification monitors at our long-term monitoring sites, and has also provided funding to the Territory for a 50 kW microgrid at one of our hurricane shelter sites; the US Department of Energy is partnering on many initiatives with the Virgin Islands’ Division of Energy, including an energy rebate program, our “Sun Power” grant program and providing technical assistance with our Comprehensive Energy Strategy; the GVI is receiving support from FEMA’s Hazard Mitigation Program for the updating of our Hazard Mitigation Resilience Plan, which identifies threats across all sectors and strategies to be implemented as part of our long-term resilience; and last, but not exhaustive, I would also like to recognize the support given to us from the Department of Housing and Urban Development, who is administering the Community-Development Block Grant-Disaster Recovery funding issued to the US Virgin Islands, which has a mandate for the US Virgin Islands to relate the activities in the third tranche of funds to the Hazard Mitigation Resilience Plan.

The proposed bill provides five sections directing the actions of our federal partners in assisting the Insular Areas and Territories with planning and implementation of climate resilience activities. The US Virgin Islands is supportive of all the directives in Titles II to VI. Overall, the USVI sees the significance of this bill as the proposed creation of programs and steady funding sources specifically for the Insular Areas and Territories to address impacts related to climate change. We applaud the bill’s sponsor for the language included in Title I, Section 101(c)(1) and (c)(2) related to “equitable baseline funding.” Many baseline formulas for assistance under federal programs use landmass or population as criteria in the allocation of funds, which means that the islands will likely always receive the least amount of funding; however, as islands, our areas are the most impacted by climate change, and therefore a different strategy should be implemented to assist our areas. It is our opinion that the passage of the Insular Areas Climate Change Act creates the equitable conditions for the islands to comprehensively address the challenges that will come as a result of climate change. I’d also like to highlight a few key points made in the bill . . .

As there are a number of programs proposed in the bill for funding between the Territories and the Freely Associated States (FAS), we would ask that the distribution of the funds be provided in the language of the bill. As the FAS is also eligible

for sources of funds not available for the Territories (such as other international programs), we would recommend an 85% share of funded programs be dedicated to the Territories and 15% funding to FAS.

As a representative of the US Coral Reef Task Force, an inter-agency body comprised of 12 federal agencies and 7 jurisdictional partners plus the FAS, with the goal of protecting the coral reef ecosystems under and affiliated with the United States, I have witnessed first-hand the benefits of inter-agency collaboration described in Title I. It reduces redundancies, streamlines processing and often results in more efficient use of funds for project implementation. The Task Force should be a partnership between the federal family and the jurisdictions with the goal of promoting adaptation and implementation of appropriate response measures to enhance resilience. Currently the Task Force only includes members of the federal family, but should include the islands as well.

The USVI is very supportive of the Coral Reef Prize Competition authorized under Title I, Section 103 of the bill. As the Caribbean Islands are faced with battling the effects of Stony Coral Tissue Loss Disease, and the Pacific Islands are increasing efforts for restoration in response to the 50% loss of coral in the last 6 years due to bleaching, awarding funds supporting innovative ideas for research and conservation in the Insular Areas will provide a great benefit for the management of coral reef ecosystems. The USVI would ask that the language also include "restoration" in addition to research and conservation, as we work with partners in more active management of the coastal coral reef ecosystems that protect our coasts and service our community with food, economy and quality of life.

Coastal water quality is both a human health and natural resource management issue that will be significantly impacted by climate change. Climate will impact available drinking water and pose increased risks from stormwater discharge. Funding should be earmarked to upgrade the infrastructure to ensure adequate drinking water supply and effectively manage the volume and quality of ocean discharge of stormwater to protect the coastal coral reef ecosystem.

Under Title IV, Section 405 as it relates to opportunities for the development of offshore wind, the USVI would ask that consideration for language to include wave energy production be included. The monitoring buoys, to include those that are part of the Integrated Ocean Observing System, suggest that there is great potential for wave energy generations in the Virgin Islands. This potential may exist beyond the territorial limits of the USVI, in the US EEZ, and as such, we would not want to limit the potential for research and investment only to wind production.

As it relates to Title V, Section 503 for the development of an Insular Area Sustainable Infrastructure Grant Program, again we highlight the significant amount of funding associated with this program which would allow the islands to make significant improvements to the infrastructure systems. We would ask that language also be considered such that each insular area receive assistance from FEMA to standardize the hazard mitigation package that will be used to respond to and restore coastal natural resource loss after future natural disasters to maintain coastal protection, rather than such loss being on a case by case basis.

Lastly, on behalf of the Insular family, I would like to thank the bill sponsor for language in Title I, Section 102(a) proposing increasing the cost-share match waiver from \$200,000 to \$750,000, as well as the many sections calling for the waiving of the match requirement for the different programs. This would impact not only programs covered under this bill, but across many of our territorial programs.

In conclusion, I would like to thank Representative Grijalva and the members of the Committee for the opportunity to address the proposed Insular Areas Climate Change Act. There are many benefits to the people of the Insular Areas and Territories that can be realized from the passage of this bill. This comprehensive strategy to address climate impacts to the islands will result, not only in improvement of our natural and built systems, but will also improve economic, social and cultural systems as well, providing a sound legacy for future generations. We look forward to Congress's favorable consideration of this bill.

QUESTIONS SUBMITTED FOR THE RECORD TO MR. JEAN-PIERRE L. ORIOL,
COMMISSIONER, USVI DEPARTMENT OF PLANNING AND NATURAL RESOURCES

Mr. Oriol did not submit responses to the Committee by the appropriate deadline for inclusion in the printed record.

Questions Submitted by Representative DeGette

Background

Rep. DeGette's Clean Energy Innovation and Deployment Act includes a provision (Section 130 of H.R. 7516 in the 116th Congress) that may be of great benefit to people living in U.S. territories, as well as on islands and in remote areas worldwide.

The provision would require the Department of Energy (DOE) to establish a certification program for electricity-related technologies for use in remote communities. Companies whose products were certified could use that fact in marketing the technologies, much as do the recipients of DOE's Energy Star label. Facilitating the deployment of these technologies would make modern electricity services more affordable, reliable, and resilient to households in remote areas, and reduce demand for expensive imported fossil fuel-generated electricity and the associated carbon emissions.

Qualifying technologies would include those that can generate electricity off-grid (such as solar panels), those that store energy, and highly efficient appliances, including lights, cell-phone chargers, computers, fans, refrigerators, stoves and ovens. DOE would only certify a technology determined to function properly; generate no greenhouse gas emissions; be affordable, reliable, durable, safe, and protective of human health and the environment; be compatible with other technologies relevant to its functioning, including those which have been similarly certified; and be available for deployment at commercial-scale throughout the territories and states of the United States.

There is already a market for these kinds of technologies, especially in developing countries, but many of the products being marketed today do not work well, are sold on the basis of fraudulent claims, or are not compatible with adjacent technologies (for example, a solar panel not being compatible with a battery). Rep. DeGette's measure would make DOE the validator of these technologies, thus driving their innovation, increasing their quality, protecting consumers in the United States and globally, and facilitating the deployment of affordable reliable resilient climate-friendly technologies to communities in the United States, and around the world, that need them the most.

Question 1. In addition to being on the front lines of climate change, are communities on your islands paying much higher electricity rates due to the fact that most electricity is generated from imported, expensive, and, in many cases, polluting fossil fuels?

Question 2. Are the electric grids on your islands vulnerable to disruption by the effects of climate change, in particular increasing storm intensity, water cycle disruption, average temperatures, and sea level rise?

Question 3. Do you believe this puts an additional and unnecessary financial strain on those living on your islands?

Question 4. Given that, do you think there might be a market on your islands for affordable reliable resilient equipment to generate and use zero-emitting electricity, reducing dependence on expensive fossil fuels and the vulnerable electric grid?

Question 5. Do you think certification of this kind of equipment by the U.S. Department of Energy, as described in the Background section, would increase consumer confidence in it and thereby promote its use on your islands?

Questions Submitted by Representative Graves

Question 1. I am concerned that the creation of new Federal programs may result in duplication with existing programs, diluting funding availability and potential impacts. Are existing programs failing to meet these needs? If so, could they be reformed to better support current inadequacies? Please provide specific examples.

Question 2. Insular areas are unique in many ways, including energy. These areas are largely dependent on imports for energy—resulting in high costs, reduced energy security and vulnerability to supply chain disruption. Distributed generation and renewables are a very good fit for the natural resource availability of many of these

areas. However, my concern is that the Federal Government would be mandating a singular approach. Even if you were to dramatically increase renewables, does it make sense to keep the door open for other energy options?

Question 3. A primary reason for a government mandates is that a desired outcome does not make financial sense over the long term. Is that the case—would renewable energy be more expensive over the long term? If not, what is the benefit of having the Federal Government impose such mandates (if it potentially ties the hands of these areas should a better option come along in the future)?

The CHAIRMAN. Thank you, Commissioner. I am very glad that you were able to finish that part of your testimony and appreciate it very much.

Now it is time for the Members to ask questions to our witnesses. And, again, the 5-minute limit will be in place for the Members.

Let me recognize myself for the initial questions.

Mr. WESTERMAN. Chairman Grijalva? This is Representative Westerman.

The CHAIRMAN. Ah, Mr. Ranking Member. I was trying to acknowledge you a couple of previous times. Now that I have you there, you are recognized.

STATEMENT OF THE HON. BRUCE WESTERMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ARKANSAS

Mr. WESTERMAN. Thank you. I could hear you, but apparently there was a problem getting my microphone unmuted, but it is working now.

Thank you, Chairman. I just wanted to make some opening comments. And I want to thank the witnesses for being with us virtually today, as well as all the Members.

As you are all aware, the U.S. territories and Freely Associated States are located in some of the most remote places on the planet. Aside from environmental and climate concerns, there are legacy issues with many of the insular energy systems, as has been highlighted by recent tropical storms. Each have individual needs and circumstances that should be given thoughtful consideration when Congress does its work.

Although when creating long-term energy plans we should consider all energy sources and technologies, we also must be intellectually realistic, knowing that the greenhouse gas emissions from insular areas is hardly a blip in the global data.

A healthy economy and a healthy environment are linked. Reliable, efficient, and affordable energy are critical to both the economy and the environment. Domestic production of both conventional and alternative energy sources ensures that the best global standards will be used to power our nation and our allies abroad, as the United States has some of the most stringent environmental and labor standards in the world.

Even assuming renewable energy continues its recent growth trajectory, global demand for oil and natural gas is not expected to fade in the foreseeable future. In fact, the Energy Information Administration predicts a 40 percent growth in global natural gas consumption by 2050.

Energy policy for insular areas must focus not only on renewability but also on reliability, efficiency, and affordability. The important question today is: What are the practical ways we can reduce pollution, promote a healthier environment, and not decimate the American taxpayers' and families' checkbooks, nor the economies and standard of living in insular areas?

Although this is our first hearing this Congress, this Committee has held numerous climate change hearings in each of its Subcommittees the past several years. Most seem to be more about playing politics and the generation of headlines instead of workable solutions.

What is clear is that a total energy transition by 2030 is estimated to eliminate nearly all of the current energy sources and the millions of jobs related to those sources. It is also clear that this would have an extraordinary cost.

The draft bill by Mr. Grijalva authorizes millions of dollars for new grant programs and offices to push the insular areas toward the use of renewables and mitigate the effects of climate change. While the intent of doing something positive for the insular areas is commendable, I believe this bill somewhat misses the mark in some key areas.

In my mind, there is nothing limiting the executive branch from forming a task force on its own to study access barriers the insular areas face and issue a report to Congress.

It is vitally important to work with each of these islands' leaders and their Members in Congress to address each island's specific goals and needs. Strengthening existing programs and grants available should come before we see an expansion of government. Congress should be providing tools to the insular areas and allowing each of them to make their own decisions on what energy sources they use or want to develop.

I am also concerned that we don't have any witnesses here today from the Administration. These officials would be able to speak to the capacity of existing programs and if increases are warranted. They would also be able to tell whether any of these new grant programs are redundant.

I hope today's conversation will help promote sensible solutions that will push for greater coordination between Federal agencies that provide assistance to the insular areas and Freely Associated States.

Chairman, I appreciate you coming back to me, with the technical problems that we had, and I look forward to a discussion with the witnesses today. I yield back.

The CHAIRMAN. No problem, Mr. Ranking Member. Thank you for your comments.

And I know the Ambassador needs to leave for his very important 1 o'clock meeting. If I may, one quick question.

You state that climate change poses an existential threat to your country and you don't use those words lightly because the very existence of your island is challenged, quote/unquote. You say that the adaptation is central to your continued ability to exercise your national right of self-determination in the face of challenges created by climate change.

Given the leadership role RMI has been playing on the international stage, particularly around the security issues that you mentioned, to highlight the issues you face as a result of climate change that you have done, what lessons can you share that could be helpful in our efforts to adapt to a new reality?

And, with that, Mr. Ambassador, let me ask you for whatever response you might have, sir. And I know that you leave after your answer, but I appreciate your time and making time for us today.

Ambassador ZACKIOS. Thank you very much, Mr. Chairman, for that very important question. And, of course, the Marshall Islands, as you have correctly said, has not only raised these issues at the regional and global levels on the existential threat that climate change does, but the Marshall Islands has also worked with multilateral institutions to address the issue of climate change.

As I mentioned in my oral testimony and in the written testimony, the Marshall Islands is part of a four atolls work that is looking into elevation of islands in the four atolls that are mostly at risk: that is the Marshall Islands, Seychelles, Maldives, and Tarawa. We are working very closely in that effort.

We have also looked at, given the studies from the University of Hawaii and others, elevation of islands so that our populations can relocate because of the threats that climate change poses. We have done energy and national strategy. We were the first to provide our national determined contribution. We are looking at renewable energy independence in 2050, coal independence in 2020, and these are some of the measures that we have. We continue to advocate the importance of climate change and how that affects us.

In the case of the Marshall Islands, we see inundations almost every year and at every cycle of them all. So, it is a real threat to us, and all these efforts are being taken. And given that we have a very important and key infrastructure for the United States in the Marshall Islands, as stated, the Ronald Reagan Ballistic Missile Defense Site, island elevation is something that is very important.

There was a study by George Washington University on elevating islands in the Marshall Islands as well as in Roi-Namur, and these are some efforts that we continue to work on. We are partners and have entered into and established organizations, including organizations to discuss and raise more awareness on the issue of climate change.

So, these are some brief comments, Mr. Chairman. I hope I have been able to answer your question. But if there is need, we could always submit further in writing to your Committee. Thank you.

The CHAIRMAN. If I may, Mr. Ambassador, one of the questions that I think invariably comes up is—do you really need to go this far in terms of the approach with not only this legislation, but other initiatives around climate change? And I think you bring a valid and unique issue, and I think the Defense Department will be studying that as well, now that they are free to do that.

Is the effect on national security and defense, in terms of the assets and the investment that has already occurred, short term and long term, and then give any followup with regard to those two topics, national security and defense, and the importance of mitigating the issue of climate change with regard to Marshall Islands

in particular in this question. But I think overall, if you could forward that to the Committee, because I think we lose sight of what that is going to cost both in terms of security, but also in terms of investment that has already occurred in those locations.

With that, let me thank you, and I will save other questions for later on.

And I now turn to Ranking Member González-Colón, Commissioner, for any questions that you might have of our panelists.

Miss GONZÁLEZ-COLÓN. Thank you, Mr. Chairman.

I will go first with Secretary Machargo from Puerto Rico. I know in his statement he made a description of the climate change expert and advisory committee and whose members were there. And I would like to know, specifically, what are the initiatives of that committee for the near future? What is the resiliency to climate change on the island? What are the top three specific goals of that committee?

Mr. MACHARGO. Yes. First, we want to hold community polls to get the input from the people on what measures we should take to tackle climate change and what are the ill effects of climate change in these communities. With that input from the communities, then the committee would be enacting a climate change resiliency plan. That, again, will be submitted for public hearings.

The plan has some very stringent goals regarding the use of renewable sources for Puerto Rico. One of the methods of the law that we are implementing right now is to work with the General Services Administration from the Government of Puerto Rico to make sure that all vehicle purchases by the Government of Puerto Rico are either hybrid or electric cars.

We are also working with the Energy Regulatory Commission to make sure that the Puerto Rico Electric Energy Authority is moving to renewable fuels for the power grid of Puerto Rico. We are also going to start a baseline greenhouse gas study, and our next step is also to have an economic study of the impacts of not having any climate change mitigation measures in Puerto Rico and what would be those effects on the economy.

Miss GONZÁLEZ-COLÓN. What is the most critical climate change related concern in Puerto Rico at this time?

Mr. MACHARGO. I think it is the coastal erosion.

Miss GONZÁLEZ-COLÓN. Coastal erosion. And we accomplished a Army Corps of Engineer study for the island during 2017 and 2018, that are still being conducted.

One of the issues that you discuss in your statement was that Puerto Rico was eligible for a series of grants, including NOAA coastal zone management grants and coral reef conservation programs, among others, and the natural resources department, that you actually directly received funding in many of those programs. How has been your experience dealing at this time with NOAA, with Fish and Wildlife, the Department of the Interior, and EPA, regarding all those grants, and how do you compare that with FEMA?

Mr. MACHARGO. We have an excellent relationship with Fish and Wildlife, EPA. We are getting Federal grants, working with them to achieve the goals of the Department. With FEMA, they take too

long. There are still many facilities of the Department that have suffered damage from Hurricane Irma and Maria that have not been inspected by FEMA, so we cannot put them in working order. And the people are concerned why those facilities are not yet ready to serve the people, and instead that we are still working for FEMA. We are frustrated by that.

Miss GONZÁLEZ-COLÓN. So, we can say that your experience dealing with the agency, in NOAA, Fish and Wildlife, Department of the Interior, EPA, are dealing with the Department very diligently to work with climate issues, and you have been having good experience with them?

Mr. MACHARGO. Yes, yes.

Miss GONZÁLEZ-COLÓN. Thank you. I know my time has expired, so I thank you.

I yield back, Mr. Chairman.

The CHAIRMAN. Thank you very much.

We are going to proceed with the Members by seniority. Let me now turn to Vice Chair for Insular Affairs for the Full Committee, Mr. Sablan. The time is yours, sir. You are recognized.

Mr. SABLAN. Yes, thank you. And welcome to all the witnesses. Thank you for taking the time to submit testimony and for appearing today.

Ms. Grecni, did I say that right? Ms. Grecni? Zena. Is that right? Can I call you Zena?

Ms. GRECNI. Yes, that is right.

Mr. SABLAN. OK. Thank you.

Ms. GRECNI. I am having a little bit of a connectivity issue. Sorry.

Mr. SABLAN. Thank you. One of the reasons I asked the Committee to include you as a witness is I was impressed with your institution's report on climate change in the Northern Mariana Islands, and also because you are able to make comparisons between Northern Marianas, Guam, and American Samoa, and, of course, they are Freely Associated States.

And you alluded in your written testimony about the updates that are needed to the energy action plans to account for more recent technological advances, the landscape effect, and all of those things.

So, I will ask you this, because I know it is important to all the witnesses and to all of the residents of the insular areas, that lowering the cost of electricity has been a long-standing goal for all the insular areas, especially if greenhouse gas emissions can also be decreased.

We have been successful in increasing funding for energy action plans mandated in Section 9 of Public Law 113-235. And the law requires the Department of the Interior to create a team of technical, policy, and financial experts to write an energy plan for each insular area and to help put the plans in action.

The goal is to reduce reliance on expensive imported fuel replacing it with low-energy sources and to improve the efficiency of island power systems. The plans are to include a specific timetable and lay out how the changes can be financed. And every year, Interior is supposed to report to Congress on whether progress is

occurring. And every year, representatives of the insular areas try to make sure that this program is funded.

So, except for initial technical energy assessments about 10 years ago and the awarding of small annual grants that some in Interior put out as if they come from their family estate, none of this requirement established by law is happening, none, zero. And there are no proposals, timelines, funding strategies to increase energy efficiency. There has been no substantial progress to move toward a reliable source of renewable energy, while increasing the recipients of energy infrastructure to extreme weather hazard.

Let me ask you, and any of the witnesses could also chime in if they wish, will transferring this requirement that is now assigned to Interior, transferring it to the Department of Energy, as this deal proposes, would it help insular areas improve energy efficiencies and reduce cost? What do you think the insular areas need to meet renewable energy targets and protect island communities?

And, Ms. Grecni, I will tell you, I appreciate your testimony. It is very well written, and your report was science and research based.

So, if anybody has an answer—Ms. Grecni can start. I have a minute left.

Ms. GRECNI. Thank you, Vice Chair Sablan. It is really wonderful to hear that the products that we put out from the scientific community can be useful in practical decision making.

I would just point out that fossil fuels make up almost 100 percent of energy budgets for all of the U.S.-affiliated Pacific Islands, and those must be shipped in, so that is not cost effective or efficient. So, I think that there is a strong need for these energy action plans to really remain coordinated.

My experience is not largely in energy; it is in science and research, in supporting decision making. But in that area I see that a lot of times we are working under unfunded initiatives, so people from the management sector and research sector are having to volunteer their time. They are having to put aside the day-to-day work and really focus on data and assembling and synthesizing research to even understand the impacts of climate change. So, if that is also the case in the energy sector, I can see that just having an influx of programmatic support would be very helpful.

Mr. SABLAN. My time is up, but if anybody else would like to answer that question in writing, I would really appreciate very much your support toward Chairman Grijalva's draft of this bill that he is proposing and remove that authority and responsibility from Interior into the Department of Energy.

Chairman, my time is up. I yield.

The CHAIRMAN. Thank you, Mr. Vice Chairman.

And let me now turn to the Ranking Member of the Full Committee, Mr. Westerman, for his time. Sir, you are recognized.

Mr. WESTERMAN. Thank you, Chairman Grijalva. And thank you again to the witnesses for your time today.

As we look at insular areas and energy systems, this is definitely an area that needs to be addressed, and I hope we can work as a Committee to address those areas, but I think we have maybe a difference of opinion on the best way to address these issues.

Mr. Sablan talked about reliability and how important that is, and I think most people who connect to their energy systems are very concerned about the reliability and the affordability of those energy systems.

Title V of this bill creates a renewable energy grant program under DOE, and it specifically says in there that the insular areas are free to choose—or it doesn't give them the freedom to choose what kind of energy sources they use. It specifically refers to renewable energy and says that it can't be generated from fossil fuels or nuclear energy, which I have always thought nuclear was one of the cleanest, most reliable sources of energy that we have.

My first question is for Mr. Machargo, and it is, would you like more flexibility in the language to allow Puerto Rico to use these funds toward other sources?

Mr. MACHARGO. Yes, we would like to have more flexibility. We are moving toward having a greater percentage of renewable energies, but the electricity regeneration in Puerto Rico, it needs to have some reliable baseload so the power can stay on when the renewables are not ready. So, I would agree with that recommendation.

Mr. WESTERMAN. And, as you know, in the United States, we have been able to cut back on emissions. We have actually decreased emissions more than the top 12 countries in the Paris Climate Accord combined without threatening the reliability actually by using more natural gas. And, again, thinking about Puerto Rico and the location to the Gulf and where a lot of our liquid natural gas exports would be originating from, would you support being able to use this funding to access LNG to use in Puerto Rico?

Mr. MACHARGO. Well, we will support it if it is within the goals of Act 33 of the percentages of renewables versus the percentages of hydrocarbons, yes. And the remaining percent of hydrocarbon that the law allows—actually, if we are going to use hydrocarbon, it should be renewable natural gas.

Mr. WESTERMAN. And, Mr. Oriol, do you believe that insular areas should have a say in what energy projects they should be able to use this money for and that the money should not be limited?

Mr. ORIOL. Thank you for the question, Representative. I believe that our systems as they exist are already primarily on fossil fuels, so I think that the limitation to want to push renewables and possibly hybridize our systems is actually a better solution for the island destinations.

And while we already have existing systems that will work on our fossils, we are trying to upgrade that infrastructure to be that cleaner burning capacity of multiple types, because I don't think that in areas where we have limited land capacity that we can rely on one single source across our territory.

Mr. WESTERMAN. Yes. I think we have seen that illustrated in a lot of places where we need multiple sources of energy to have that reliability. Also, affordability is something that I think is very important. And I am just wondering how much economics are actually considered or would be considered in these projects, and how much of a burden it would create on people on the islands to get their

electricity so that it would not only be reliable, but also would be affordable.

One area of renewable energy that I am a proponent of is using woody biomass, which also, when we look at Puerto Rico and the Virgin Islands and their proximity to the mainland, you could be a huge market for domestically produced wood pellets. But although it is not called out in the language, I am guessing woody biomass would be frowned upon as an energy source as well. So, I would open that up to anyone on the panel about your thoughts on using woody biomass as a fuel source.

The CHAIRMAN. The time is up on those questions, and we will adjust and see if there is any response going forward.

Let me now turn to the Chair of the Subcommittee on Energy, Mr. Lowenthal, for his questions. Mr. Lowenthal.

Mr. LOWENTHAL. Thank you, Mr. Chair.

I thank all the witnesses for being here. I am enjoying this tremendously and being educated myself.

As we all know, the reason for this hearing is climate change is already bringing increased temperatures, sea-level rise, and 100-year extreme weather events are now occurring once a decade, not once every 100 years, and it is only going to get worse. Now talking about the insular areas surrounded by sea, populations largely in low-lying areas and largely situated in areas that are prone to both hurricanes and typhoon activities, climate change is going to continue to have an outsized impact on our territories.

So, in all of your testimonies, many of you, both in your written and sometimes the oral testimony, and we have already had this very extensive discussion about the need and opportunities for expanded renewable energy projects and how the Insular Area Climate Change Act can help jump start such projects.

And the bill creates, as we know, the interagency task force, new grant opportunities at different agencies for renewable energy projects, as well as the study and available leasing for offshore wind opportunities, all bringing exciting new opportunities for cleaner power sources for the territories, as well as greater energy independence.

But I am interested in digging a little deeper into this, because some territories may be better suited for some renewable sources, while with proper siting, all of the territories may have the opportunities for several different technologies.

Mr. Oriol, in your testimony, you mentioned the potential of wave energy in the Virgin Islands; Mr. Zackios, you mentioned the opportunities for solar in the Marshall Islands; and, Ms. Grecni, you have discussed solar and wind opportunities throughout the territories. I would love for each of you to briefly go into the renewable energy potential and where this bill will help and maybe where this bill may need to have some additions.

Mr. Oriol, can we start with you, and, Mr. Zackios, and then Ms. Grecni, and, if we have time, from any of the other witnesses on this area. We are going to dig a little deeper into what is really the renewable potential that you see in the territories that you are here speaking about. So, I am going to start now.

First, Mr. Oriol, can we start with you?

The CLERK. Mr. Lowenthal, I believe he is having connectivity issues.

Mr. LOWENTHAL. Oh, OK. Any of the others want to tell us a little bit more in depth about what are the potentials for renewable energy, dig a little deeper on the actual potentials and what you see—what kinds of renewable energies we are talking about.

Dr. SHELTON. Hello. This is Austin Shelton from the University of Guam.

Mr. LOWENTHAL. Yes.

Dr. SHELTON. I would like to share, Congressman, that the potential that we have is to meet our mandates for 50 percent renewable energy by 2035 and 100 percent by 2045. Our power authority here in Guam is confident that they are going to be able to reach the 50 percent with existing technology and solar energy. And as more technologies are developed over the years, I think we are confident that we can get to the 100 percent by 2045.

The reason that this bill, I think, is important for us is because it will provide the critical technical assistance. So, we are looking forward to working with the Department of Energy, the national laboratories, to understand the potential for other technologies that will work.

For example, in high school, I used junkyard materials to make energy from the ocean currents behind my house. So, it can be done cheaply in some instances, but we need the higher level technology to shift to the greener infrastructure, which I think is possible for islands in many different ways.

Mr. LOWENTHAL. So, now you are going to look both at the addition and the technologies around solar and then really move and look at if there are other potential sources of energy also?

Dr. SHELTON. Correct.

Mr. LOWENTHAL. Anybody else want to talk about what specific energy sources you are going to move quickly to, and what are the other opportunities that you see?

Mr. ORIOL. Hi. Good afternoon, Congressman. This is Commissioner Oriol again. I apologize for my bandwidth issues.

The Virgin Islands is actually in the midst of a comprehensive energy strategy for the territory right now and working with a number of partners, NREL, in trying to determine what the best way forward for the territory is, which is going to be a diversified program.

And what we do know is that with a territory population of 100,000 people, we need to make a municipal system across that, because we are not going to be able to individually support what those costs are.

So, this Act and the funding that is pledged toward the planning and then the infrastructure for it allows for multiple things to be thought of across that time frame. But then, also, because it is sustained funding, as technology evolves, we would then be able to access that funding and install that infrastructure that would allow us to diversify our grid across the territories.

Mr. LOWENTHAL. Thank you.

And I am going to yield back. Thank you very much, Mr. Chair.

The CHAIRMAN. Thank you, Mr. Lowenthal.

Let me now ask Mr. Gohmert, who is recognized for 5 minutes.

Mr. GOHMERT. Thank you very much. I appreciate our witnesses. I appreciate it, Mr. Chairman.

Dr. Shelton, you were talking earlier about Guam's capacity and the batteries that you are developing. And, by the way, I love your island. In fact, I love all the islands we have had Representatives from. But at Guam, I even loved being a single lover at Two Lovers Point out there, but you have a beautiful island.

But I was wondering, I am from Texas, and what we have found is—and I don't want to be too elementary, but in severe storms, especially prolonged severe storms, solar doesn't end up being a very reliable energy source. And I still have confidence some day some bright mind is going to figure out how we can hold gigawatt electricity, massive amounts, and not lose much but hold it efficiently. And I think that that is the far greatest need we have. If we can hold massive gigawatt electricity—as you know, we can hold DC currents in low batteries, but we are not there. But when we can, our problems will be over, I think.

But, in the meantime, you mentioned the batteries that you have, and I am wondering what is the capacity that you have? How much energy are you able to store and for how long?

Dr. SHELTON. Thank you for the question, Congressman Gohmert. I don't think I spoke about batteries, but I do know that the Guam Power Authority is developing a solar farm right now that should have around 100-something megawatts storage capacity. I think our total island need is in the megawatt range. We don't have—I mean, 200 something. I am sorry, I will find the correct numbers to you to submit in writing. But I think we are in the 100-megawatt range for the storage right now with that capacity.

So, perhaps as islands can serve as an example, in a bright spot, with our lower energy needs, that the battery storage is actually more feasible here than in large-scale gigawatt states like Texas.

Mr. GOHMERT. I haven't seen a briefing recently. How many American troops do you have at Guam now? I was thinking some years back they were increasing those numbers, so it is important that we not only keep Guam powered for the good people of Guam, but also with the wonderful host that you have been to American servicemembers. Do you know about how many you have out there on the far end of the island?

Dr. SHELTON. No. I am sorry, Congressman. I don't want to take a guess at that. I know we have quite a few, but I will say that the Guam power—the Department of Defense is one of our Guam Power Authority's largest customers, and I think they have a good partnership with the reliability that Guam is providing for the Department of Defense's energy needs.

Mr. GOHMERT. OK. Well, I mean, back before nuclear energy, the Navy was the most intensive at developing battery capacity, but then when nuclear came along and submarines and ships shifted over to nuclear, that money and that effort at research failed, but now we have a new interest in that. I am hoping we will get there at some point.

But we also learned in Texas, through our latest storm, that wind capacity can be so overwhelming that it becomes a nonfactor. So, I think the key to the renewables is if we can develop a way,

whether it is a battery or some type of capacitor that can hold that energy, heck, we might even be able to capture some lightning to power things, but in the meantime, we have to struggle along.

I wanted to ask Ms. Monzón—you are right, there have been two Category 5 devastating hurricanes. I mean, Puerto Rico has suffered before, but a Category 5 really is so devastating. With China set to double the number of coal-powered plants that they have and India continuing to just spew so much pollution into the air, ends up coming over to the United States, I am wondering what specific actions can the United States take that will stop Category 5 hurricanes?

Ms. MONZÓN. Well, thank you for the question. This is not going to get any better from here. This is something that we have to understand. The hurricane trend of Category 4's and 5's is up, and unfortunately, this is going to be devastating for our islands. Before, we thought that we would have a Category 5 almost every 100 years. Now, we are thinking perhaps 25, 20 years, and we don't know. We are 3 months from starting a new hurricane season, and we are in a very fragile, fragile environment, because we are still recovering from Hurricane Maria, had an earthquake sequence, and are also under COVID. So, all our resources are compromised and are vulnerable to face another hurricane season.

Mr. GOHMERT. Well, and that is why I was hoping that you knew of something specific we could do to help reduce the Category 5. The last thing Puerto Rico needs is another 5. Anyway, hopefully at some point we will figure out what can be done to end Category 5's, but in the meantime, our hearts and our assistance goes to Puerto Rico. I know you are struggling. But my time is expired, and I appreciate your participation. Thank you.

The CHAIRMAN. The gentleman yields.

Let me now ask Ms. Leger Fernandez, Chair of the Indigenous Peoples Subcommittee for the Full Committee. Ms. Fernandez is recognized.

Ms. LEGER FERNANDEZ. Good afternoon. Thank you so very much to our panelists, to Chairman Grijalva for this legislation, to the great questions that we are hearing that are illuminating what we must do.

The stories of the risks of the sea-level rise, the ocean warming, the devastating hurricanes and cyclones, but also, that the islands are rising, right. The islands are rising. I liked hearing that because I think that we have much to learn and that your adaptation and response to build resiliency to get to 100 percent in 2045 is inspiring, and it might provide us lessons for action throughout the United States.

So, in this bill, among other provisions, I am very supportive of the waiver of non-Federal cost-share requirements for some of the programs. I have worked on FEMA disasters with tribes and other communities in New Mexico, and we know that our most vulnerable, who suffer most from disasters, also have the fewest resources to rebuild in a green and resilient manner. So, I look forward to working with my Chair and colleagues to see if we can extend those exemptions to other communities in future legislation.

Before the panel, I notice that the bill throughout has language to ensure the Federal agencies provide technical assistance to the

communities. As you know, in New Mexico, we have the Los Alamos National Lab and Sandia National Lab. They are so interested in working on clean energy technologies such as renewables and microgrids.

The Chair recognized that climate crisis is a national security threat and that these labs are tasked with addressing these national security threats. So, I wanted to see if any of you have worked with the labs or if you see that there is an opportunity working with these DOE labs on climate adaptation, designing energy infrastructure, geothermal, those new technologies that Mr. Shelton acknowledged we need to get to that 100 percent for 2045.

This is a question for the panel. I don't know if Mr. Austin or if any of you want to take that up again.

Dr. SHELTON. Thank you, Congresswoman Fernandez. I can just make a quick comment that we haven't had the pleasure of working with the national labs based in New Mexico yet, but we have worked closely in the past with the National Renewable Energy Laboratory, which I believe is in Colorado, if I am not mistaken, and they helped us create our last energy strategy for the island.

And we have just applied for technical assistance to create the roadmap to 100 percent renewable energy, so we are hoping that we will be considered favorably for that opportunity, and we look forward to learning about more technologies to achieve our 100 percent renewable mandate. Thank you.

Ms. LEGER FERNANDEZ. Great. Well, I will raise the issue with our labs and make sure that they think about what we are doing in the territories.

If anybody else wants to answer that, I would also then maybe talk a little bit about the microgrids and community resilience, especially with regards to community solar and for those individuals or communities who can't afford their own rooftop solar and battery. That is another issue that I think is really important.

Can you, any of the panel, talk about how they are implementing that on the island and whether you think you need more support? Is everything in place for you with regards to that?

Mr. ORIOL. Good afternoon, Congresswoman. This is Commissioner Oriol from the U.S. Virgin Islands. To answer your first question, we are not working with the labs in the New Mexico area, but like Austin mentioned for Guam, the Virgin Islands is working extensively with the National Renewable Energy Lab based in Colorado. They are a part of our comprehensive energy strategy technical committee, and as I mentioned previously, we are working to diversify our grid. So, microgrids are, in fact, one of the strategies for us.

If you are familiar with the U.S. Virgin Islands, we are a system of four main islands. And when one of the main islands, Saint Thomas, will shut down, then that will have effects on our neighboring island of Saint John and also Water Island.

So, microgrids are, in fact, currently part of the strategy so that if, in fact, we do have a service interruption on the main island, the islands of Saint John, for example, which I believe were the furthest along on our microgrid right now, we would be able to still have the energy capacity to power its system and power the island. And we are looking at multiple areas to place microgrids rather

than having everything tied back to the main plant in case of interruptions, that it is not disturbing the entire island all at one time.

Ms. LEGER FERNANDEZ. Thank you for your answer, and my time is expired.

I yield back.

The CHAIRMAN. The gentlelady yields back.

Let me now—Mrs. Radewagen. Representative, the time is yours.

Mrs. RADEWAGEN. Thank you, Mr. Chairman and Ranking Member, for your work in putting this hearing together. And thank you to the panel for your testimony.

I also want to thank Chairman Sablan and Ranking Member González-Colón as well for the efforts on behalf of the territories.

The goal of the studies and funding grants outlined in the proposal to help prepare the territories to handle the effects of climate change is noble and worthwhile. And while I do have some concerns about parts of the draft bill we are discussing today, I am hopeful today's hearing will help us reach bipartisan solutions as we move forward.

Let me begin by highlighting some of the unique challenges faced by American Samoa. Based on statistics from the University of Hawaii and briefings I have received in the past from our Sea Grant Fellows, the global sea-level rise averages one-eighth of an inch every year in American Samoa. However, the total real delta change for American Samoa is closer to an alarming three-quarters of an inch per year.

So, actually, we have lost over 7 inches in the last decade, 10 percent from sea rise but 90 percent due to shrinking of our main island Tutuila, which is essentially a mountaintop arising from the sea. We are literally sinking due to volcanic activity and seismic shifting, and it is this shrinking effect which is the bulk of harm happening much faster than the sea-rise effect, which is somewhat unique to our principal island of Tutuila. As such, any resiliency initiatives for American Samoa should take this into consideration and prioritize buffering our seawall construction and preventing erosion.

One of the other concerns faced by American Samoa is meeting our energy needs in a remote marine-based and dependent economy. Our territory knows better than anywhere else that a single hiccup in the oil supply chain can cause prices to rise or, worse still, leave us completely in the dark.

It makes sense not to place all of our eggs in one basket, and alternate sources of energy play their part in filling those gaps. For example, the Island of Ta'u, in my home district, is almost 100 percent solar powered. They are completely off the regular grid and are using some of the latest in solar panel technology. That said, not all forms of energy are created equal. We are blessed to have abundant tropical sunshine, and that is a solution that works well for us.

But I have some concerns about the one-size-fits-all approach this bill takes in places, particularly in regards to offshore wind farms. I supported wind energy initiatives for the territories in the past that give the territorial governors final discretion, and my office has been working with Ranking Member González-Colón on her wind energy legislation for a while now.

This draft bill, however, departs from past drafts as it mandates that the Secretary make at least one wind lease sale in each of the territories. The bill makes some efforts to consult with the territories' governors before the lease or sales. So, I would hope we can see some modification in this regard to weigh the governors' views more heavily when it comes to if, when, and where a lease or sale shall take place.

My constituents have expressed concerns, many times to myself, our governor, and their local village leaders about the impact windmills will have on cultural land and sea traditions, scenic views, wildlife impact, and fishing access. Our fishing has been severely restricted with national sea monuments expansion. We also have several endangered species of birds and bats to think about.

And aesthetic views from the shoreline mean much more in our island tradition. You see, we bury our dead, our loved ones, right beside our homes, a lot of times above ground and usually with the best possible views of the sea. The creation stories of our culture revolve around Tagaloa and the creating of the Samoan Islands and others as stepping stones. The point is, our people place their loved ones on their land specifically to have these sacred views, so we must protect that tradition.

I want to reiterate, I am fully supportive of keeping our alternative energy options open. Chairman Grijalva's bill comes from a good place and is a very good start, but I would hope we can accommodate our governors' authority against forced changes from Washington that will impact our island's history, culture, and way of life.

American Samoa voluntarily ceded these islands in exchange for the promise of protection of just these very cultural traditions and ways of life called our Fa'a Samoa. I am hopeful the process will yield legislation that can reach an effective compromise on this front.

We have 25- and 50-mile restrictions imposed on certain fishing areas, so perhaps setting distance limits so that the wind farms are not so visible from the shoreline would help, or allowing the governor a veto over projects too close to shore within specified limits would be possible. There seem to be some options here, and I would like to work with the Majority to find the best fit.

Finally, lack of funding and cost-matching ability often are barriers to entry to resiliency projects in American Samoa, and the Chairman's bill makes great efforts addressing that.

Thank you again, Chairman Grijalva, for your bill and the opportunity to comment. I know you and the Ranking Member and all the Committee members care about the territories' needs and appreciate it, and I hope you can all enjoy the natural beauty this Committee is working to protect on a CODEL sometime this Congress to investigate these and other issues.

Thank you, and I yield back my remaining time, if there is any left, to Ranking Member González-Colón.

The CHAIRMAN. Well, I don't think there is any left. But anyway, let me—Mrs. Radewagen, let me tell the gentlelady that her comments and her observations are important and valid, and look forward to working with her on the points that she made.

Let me now ask Ms. Katie Porter, Representative, Chair of the Oversight and Investigations Committee, for her 5 minutes. You are recognized, Ms. Porter.

Ms. Porter is recognized for 5 minutes. Is she there?

Let me move to the gentlelady from Colorado, a valuable member of this Committee, Ms. DeGette. The floor is yours. You are recognized.

Ms. DeGette?

Mr. SABLAN. Not here as well, Chairman Grijalva.

The CHAIRMAN. OK. Going down the line, Mr. Soto—the gentleman is recognized for 5 minutes, if he is available.

Mr. SOTO. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Mr. Soto.

Mr. SOTO. I appreciate the opportunity.

We know that climate change, the climate crisis is an existential threat to the human race, and we see low-lying states like Florida be affected like so many of our insular lands, whether it is the rising seas or whether it is through strengthening in extreme hurricanes as well as monsoons. And we know we have to do something about it, which is why I am very excited about the Chairman's presentation of a draft for the Insular Area Climate Change Act of 2021. It is a draft because we are seeking your input, and that is absolutely critical.

As you know, the bill would help centralize and expand Federal energy programs—which programs and how we do it, we are here today to listen to that; create multiple grant programs; invest in renewable energy and sustainable infrastructure; taking care of the causes of climate change, fossil fuel, and other pollution; and also making our infrastructure more resilient against hurricanes and other extreme weather.

This bill will be a critical part of the Build Back Better infrastructure package that we will be working on over the next few months. And the bill will also ensure that our insular lands won't be left behind as we give America a well-needed upgrade.

And, Chairman, I wanted to thank you personally for the inclusion of the coral reef section, which will complement our Restoring Resilient Reefs Act very nicely in protecting declining reefs, including the Great Florida Reef and so many other reefs in the Caribbean and the Pacific.

Turning to my family's native island of Puerto Rico, in 2019, the Puerto Rican legislature passed an amazing goal, 100 percent renewable energy by 2050. Sadly, it has been about 2 years since we had our hearing in this Committee with HUD and with FEMA about the \$1.9 billion HUD grant to upgrade the electrical system. We are still waiting on that, and that is critical funding to help with this upgrade, to meet this challenge that the Puerto Rico legislature has set for itself.

Secretary Machargo, do you know what the status of this grant is and why is it so important that we finally get the grant?

Mr. MACHARGO. The information I have from the Puerto Rico Electric Power Authority is that they submitted their plan to FEMA and that they are about to get started with their overhaul of the electrical grid of Puerto Rico.

Mr. SOTO. OK. But it looks like we need to help you.

Secretary Machargo, I know about a year ago, 4 percent of the total power was renewable. What is the percentage today, so we get a sense of what we need to do to help in this bill?

Mr. MACHARGO. I think it is about 20 percent, and we have to raise it according to the goals of Law 33 to increase it to 50 percent in a couple of years. So, we are working toward that goal. The Puerto Rico Electric Power Authority is very aggressively pursuing renewable source of energy, and the Energy Commission is making sure that any further expansion on the energy grid, any new type kilowatt added should be renewable energy.

Mr. SOTO. Last, Ms. Monzón, about the importance of community-driven renewable projects, how critical is this bill to making sure we get solar into rural communities in the central part of Puerto Rico and other hurricane hard-hit areas?

You are on mute.

And, Chairman, I believe some of my time was already running by the time you called on me. You may want to check with staff on that.

Ms. Monzón.

Ms. MONZÓN. It is extremely critical, Mr. Soto. As a matter of fact, I think that because of the interruption of energy, we lost so many lives because people couldn't get access to services because it was delayed for a long time. So, as much as we can, we need to invest in renewable energy. It is the only way that we can make sure that hospitals, the emergency management offices, the critical essential services facilities can have access to their own energy, so that then they can provide the services that are needed, especially in catastrophic hurricanes or catastrophic events, because that is the time where we get tested. At that time, that is when we need to provide the services so that we don't lose lives.

And in that sense, I think that we have to invest hard to switch to renewable energy and at the same time avoid disruption in water services, in health care, food supplies, the whole supply chain, because all of that provides for the stability and the response and recovery of our islands in case of a catastrophic event.

Mr. SOTO. Thank you. And my time is expired.

The CHAIRMAN. Thank you, Mr. Soto.

Mr. Stauber, you are recognized, sir, for 5 minutes.

Mr. STAUBER. Thank you, Chair Grijalva.

Mr. Machargo, thank you for your public service to Puerto Rico, and thank you for testifying today.

Chairman Grijalva's bill calls for a massive expansion of energy technology, especially wind as the bill requires further offshore lease sales. As you may be aware, a single wind turbine requires 335 tons of steel, nearly 5 tons of copper and others.

One concern with this bill is that I see no buy-American requirements. In northern Minnesota, our iron miners produce the taconite that feeds 80 percent of this country's steelmaking. However, our top steelmaking competitor is China. Unfortunately, China's steelmaking requires a 50 percent higher greenhouse gas emissions footprint.

For this one windmill, this is more than 300 hundred tons of carbon equivalents produced if the turbine is sourced in China. If

the goal is truly a reduction in greenhouse gas emissions, can you commit to sourcing LNG energy components domestically?

Mr. MACHARGO. You are asking me?

Mr. STAUBER. Mr. Machargo, yes.

Mr. MACHARGO. Well, unfortunately, I am not in charge of the Puerto Rico Electric Power Authority, but I think your advice is well taken, and that we should source our wind power turbines from places that manufacture with energy efficiency because we don't want to defeat the purpose of moving toward renewable energy. You have seen a source of renewable energy that it takes oil-based energy or carbon-based energy to manufacture, so I think that advice is well taken and I will convey it to the Puerto Rico Energy Commission and the Puerto Rico Electric Power Authority. So, I welcome that suggestion.

Mr. STAUBER. And I think that that is very wise to invest in those domestically sourced materials that are produced using less carbon emissions with our labor standards and our environmental standards, and I appreciate your comments.

I yield back, Mr. Chair.

The CHAIRMAN. Mr. Vice Chair of the Full Committee, Mr. García, you are recognized for 5 minutes.

Mr. SABLÁN. Chuy, we can't hear you.

The CHAIRMAN. Mr. García, you are recognized for 5 minutes.

Mr. GARCÍA. Oh, sorry. Yes. Thank you, Mr. Chairman. Sorry about that blip. Thank you for holding this hearing. And, of course, thanks to the Ranking Member.

Today, we speak on one of the most important issues that we are facing and one that will impact generations to come: climate change.

In one way or another, we are all impacted by climate change, but for those living in the insular areas, the impact is immediate and deadly. They do not have the luxury or privilege of ignoring climate change. The insular areas are a tragic reminder of why climate action cannot wait.

In 2017, two major storms, Hurricanes Maria and Irma, impacted Puerto Rico and the U.S. Virgin Islands, causing thousands of deaths and significant damage to Puerto Rico's fragile power grid especially. Over 3 years later, people are still reeling from the pain and the islands have slowly recovered, despite the Federal Government's slow response.

The evidence is clear: Rising temperatures and heavier rainfall both play a key role in intensifying hurricane strength and destruction, and it will only worsen unless we act now.

As currently drafted, the Insular Area Climate Change Act of 2021 would provide the U.S. territories with long-overdue access to climate change and related Federal programs.

Finally, but equally important to this proposal, is the importance of a process that is inclusive, transparent, community-led, and community-driven. Bottom line, the people who are most impacted by climate change should be at the table.

Question for Secretary Machargo Maldonado. Thank you for joining us. Mr. Secretary, do you agree that people who are most impacted by climate change should be included in the decision-making process?

Mr. MACHARGO. Yes. Thank you, Congressman García.

Yes, I agree that the decision of the climate change resiliency and response strategies should be a product of our public participation and should be brought out all throughout the communities, because there are many communities that are affected differently, especially those coastal communities that are seeing their homes being eaten away by the ocean. I have been in a community in Guayanilla that has been literally sinking, and the people are losing their homes. So, those people who have the most serious impact should be heard. I agree with you, Congressman García.

Mr. GARCÍA. Thank you, sir.

And are you aware of the harmful impact that the construction of a proposed development, Kontel Adventure in Santa Isabel, would have on the community, environment, and endangered species, including cutting off the residents of the city from access to the beach?

Mr. MACHARGO. Well, according to the law of the Commonwealth of Puerto Rico, everybody should have access to the beach. That would be illegal, to cut people from access to the beach.

I will take note of that case that you mention, and I will look into it to see if they have all the permits, and I will evaluate any negative impact that that project will have on the surrounding communities.

Mr. GARCÍA. Thank you, Secretary.

Also, I want to know if the communities near Bahia Jauca were informed in advance of this development. And were there public forums or not—I have heard that there weren't—to address the concerns? That would be appreciated.

The communities near Bahia Jauca were some of the hardest hit by Hurricane Maria and are still struggling more than 3 years later. A project of this size with potential negative environmental impact must have public input and consideration.

So, Mr. Chairman, I ask for unanimous consent to enter a letter on behalf of Salvemos Jauca into the record. Salvemos Jauca is a movement by a local organizer to ensure that the ecological and biodiverse treasures of Bahia Jauca are preserved.

Most importantly, community input must always be prioritized so that people who are most impacted by such developments have their voices heard.

Thank you. And if there is unanimous consent, I yield back.

The CHAIRMAN. Without objection, so ordered.

[The information follows:]

SAVE JAUCA COMMITTEE

December 12, 2020

Hon. RAÚL M. GRIJALVA, *Chairman,*
House Natural Resources Committee,
1324 Longworth House Office Building,
Washington, DC 20515.

Dear Chairman Grijalva:

The Jauca Beach, located in the southern town of Santa Isabel, Puerto Rico is in danger of providing the last public community access to its beach. Our community recently discovered a construction proposal that will place a hotel in its last public access to the beach. For these reasons, the Save Jauca Beach Committee and residents of Puerto Rico request your aid in stopping the hotel construction and conserve its access to the people of our hometown in Santa Isabel, Puerto Rico.

The hotel construction would affect its ecological and biodiverse treasures, as well as the community that surrounds it. Firstly, our Jauca beach bay area contains archeology treasures documented by archeologist Juan Gonzalez. Also, it contains great biodiversity in danger such as the Manatee and mangrove forest that could be affected by the construction of this Hotel.

As people of the City of Santa Isabel we are opposing to this Hotel since it will limit the current use of the community and safety since the terrain where this hotel is proposed to be in the Maritime land. And lastly, after hurricane Maria it was reported by FEMA that this very same beach area was reported as a flood zone.

We are requesting your intervention as Chairman of House Natural Resources Committee since the local government and agencies seem to bypass the protection of our natural resources and the public access of the people to it. Our request is to preserve and protect the Jauca Bay Maritime land and to guarantee the conservation of our natural resources.

In times of global warming, sea level raise, and stronger storm systems on our region, we urge you to stand up for the natural resource access, for the maintenance of healthy communities and a safe climate.

Respectfully,

MOISES MARRERO • NELSON TORRES • ELERI OSSORIO

The CHAIRMAN. And, Mr. Secretary, let me associate myself with Mr. García's question and comments regarding this development. And any information that is forthcoming will be disseminated to the Committee. There is a great deal of interest on the part of many of us as to that particular development and its potential impacts. So, we are looking forward to it, and thank you very much for your willingness to provide that.

Mr. MACHARGO. Mr. Chairman, I will look into the case and provide the Committee with the information regarding the case and the concerned public participation.

The CHAIRMAN. Thank you so much.

Let me recognize Mr. Tiffany.

Representative Tiffany, you are recognized for 5 minutes.

If not, Representative Carl, sir, you are recognized for 5 minutes.

Representative Rosendale, you are recognized for 5 minutes.

Mr. ROSENDALE. Thank you, Mr. Chair and Ranking Member Westerman.

The CHAIRMAN. You are welcome.

Mr. ROSENDALE. And thank you to the entire panel for joining us.

As an avid outdoorsman who lives in a rural community adjacent to Montana's largest state park, Makoshika, and two of the nation's gems, Yellowstone National Park and Glacier National Park, I

know how special the environment is to our way of life in Montana and to the balance of the United States and the territories.

I believe that we have an obligation to balance environmental protections with responsible energy production, and the two are not mutually exclusive. It is of grave concern to me when the government unfairly picks energy winners and losers in order to placate the environmental, green lobby.

Modern American energy development goes to great lengths to minimize their environmental footprint by operating under the strictest regulatory standards and restoring disturbed areas to better than predeveloped condition.

Traditional fuel sources continue to be the most reliable source of energy for the electric grid. They can be stored on-site, are dispatchable, and operate 24/7/365 days a year.

While I believe in an all-of-the-above energy approach, this proposal completely ignores that science and continues to push the left's Green New Deal initiative, which dramatically drives up energy costs for those who can least afford it.

So, Secretary Maldonado, thank you for being here today.

Nearly three-fourths of the energy used in Puerto Rico comes from petroleum products, all of which are imported. Currently, just 2.5 percent of Puerto Rico's electricity is generated by renewables.

We have seen the devastating impacts hurricanes have had in Puerto Rico and the need for a reliable energy grid. How does Puerto Rico plan to implement grid reliability if mandated to transition to 100 percent renewable energy? And what measurable impact will this have on our climate?

Thank you.

Mr. MACHARGO. OK. Thank you, Mr. Congressman, for the question.

One of the ways that Puerto Rico should recover and rebuild its electric grid is through the use of microgrids to make sure that critical infrastructure, like hospitals and government buildings, should have energy sources.

Also, due to the production costs of the Puerto Rico Electric Power Authority, moving toward renewable energy has represented a saving in the cost per kilowatt, and regarding the effect on Puerto Rico's contribution to output, I don't think it would be that great, but every little bit helps.

Mr. ROSENDALE. That is an awful lot to pay for a little bit of help, Mr. Maldonado.

Do we have any kind of—we still have some time here. Do we have any kind of cost estimate on what that investment would take?

Miss GONZÁLEZ-COLÓN. Mr. Rosendale, will you yield?

Mr. ROSENDALE. Yes, I will.

Miss GONZÁLEZ-COLÓN. Thank you, Mr. Rosendale.

Secretary Machargo is from the Natural and Environmental Resources Department, so he is not in charge of energy for the island.

We do have the Puerto Rico Electric Power Authority, which is the government-owned company managing all energy, and then you have the Energy Commission.

And I agree with you 200 percent. We need to move forward for having energy solutions on the island that can be reliable, that can be constant, that can meet the demand of the industry as well.

And being an island, that means that right now we are burning oil. And we need LNG, we need a lot of other opportunities. And I know that the island approved the law to have 100 percent renewables by 2050, but right now it is just 2 percent that we have.

I think one of the biggest issues is bringing the Energy Commission of Puerto Rico and discuss that same question you brought to the Committee. How much is it going to cost? How soon is that going to be implemented? Because you are hitting the target here. And I think that the perfect people to answer those questions should be the Energy Commission of the island and the Puerto Rico Electric Power Authority.

And, with that, I yield to you.

Mr. ROSENDALE. Thank you.

Mr. Chairman, with that, I yield back to you.

The CHAIRMAN. The gentleman yields back. Time is up. Thank you very much, sir.

A new member to the Committee. Welcome, new member to the Committee, Mr. Cohen. You are recognized for 5 minutes if you are available.

Mr. COHEN. Thank you, Mr. Chairman. I am here.

I have enjoyed the meeting. This is my first Committee meeting on Natural Resources. I am a rookie. I appreciate you not requiring me to wear a beanie and signify that, but I would do that, because it is an honor to be on this Committee.

And climate change is one of the major reasons why I wanted to be on this Committee, and protection of our waters and oceans. And, of course, that would include the insular areas.

So, I thank you for the Committee meeting.

I had a great opportunity to visit Puerto Rico February a year ago with Chairman DeFazio on a CODEL. And the Ranking Member, I think, joined us in the Virgin Islands. The first time I have been to either of those parts of the United States, and I learned a lot and enjoyed the experience and learned about the hurricanes and the devastation on those two islands.

We need to be concerned about the effects the climate will have on those islands and on all the islands of the United States. So, this is an important meeting, and I am just learning and will follow along and try to learn more about what we can do to protect these areas, which we need to do. They are valuable.

And I just wonder, is the gentleman still on from the Virgin Islands?

Mr. ORIOL. Yes, Congressman. Yes, I am.

Mr. COHEN. Have you all constructed a statue of Delegate Plaskett yet? You know, she is a hero.

Mr. ORIOL. I am sure it is in the works.

Mr. COHEN. I thought he was the greatest guy from the Virgin Islands, but Stacey Plaskett has surpassed him. She is phenomenal.

And Commissioner González-Colón treated us wonderfully in Puerto Rico, and I thank her for that. It was a great trip and a

learning experience. She taught me something about Roberto Clemente, but she didn't tell me that Francisco Lindor was also from Puerto Rico, and he is a good guy too.

But I will yield back and look forward to learning from the Chairman and the other Members, and take my position as a freshman. I yield back my time.

The CHAIRMAN. Thank you very much, Mr. Cohen. Appreciate it. Let me now ask Mr. Moore. You are recognized for 5 minutes, sir.

Mr. MOORE. Thank you, Chairman.

And thank you all for being here today. I do appreciate the time you have taken to share with us some of the challenges you face.

I try to make every issue that comes up a bit personal, and this is another area. After the hurricane, after the devastation in Puerto Rico, a very, very close friend of mine is married to a gal whose sister lives in Puerto Rico. He organized a trip, he raised money, he went down there personally. Being able to contribute in a small way to that is a way that brings our world together.

The areas that are involved in this, they mean a great deal to America, to the inclusive nature of territories, states, whatever you want to—this is an inclusive matter, right? And with respect to two big areas, with military and tourism, I hope that we are able to communicate that, and I hope that you are able to understand that this entire Committee cares and understands that greatly.

Some of the comments previously, just about the importance of military. I also serve on House Armed Services, so I hope to be able to bring this topic to that Committee as well, given the specific nature of Guam.

I do have concerns with the discussion draft of the Insular Area Climate Change Act.

We have made incredible strides in recent years toward reducing our emissions, improving the efficiency of our energy infrastructure, and making breakthroughs in cleaner technologies. And I want to always be a force for market-based solutions and not forcing or overly mandating these types of things but creating the right incentive program, creating the right data to be able to continue to move us in the right direction. I sincerely believe that the market is doing a good job at this, and we are witnessing a shift toward cleaner technologies.

So, I just want to be able to be a voice in making sure that this debate on this topic isn't shaped by sensationalism. We can't focus only on one industry or one interest group with respect to this topic. And I hope that we can create a really good dialogue going on with all my colleagues on this Committee and those of you that are willing to show up.

I have a few questions in mind, and one was just, I believe, brought up, but feel free to touch on it as I toss this over to some of the experts here, or the witnesses.

Just specifically, in plain speak, how can we move toward replacing petroleum as—what can we replace it with for a reliable source on the islands, specifically for Puerto Rico, given that 75 percent of Puerto Rico's energy needs are met?

But the other question that I will pose—and I welcome any comments in these last couple minutes that remain. I am a strong

believer in the importance of locally inspired, locally led, and locally executed projects. Any additional experiences that you all have had that will contribute to that would you like to share with us at this time? I think that we can find real solutions in that, local-led.

So, either of those two questions, I will yield to anybody that would like to jump in on that. I don't want to specifically direct my comments toward anybody, but I will yield, though, and would love to hear your thoughts.

In particular, Mr. Shelton, any other locally inspired that you would like to share?

Dr. SHELTON. Thank you, Congressman Moore.

I think for locally inspired energy generation, that is a little bit difficult. I mean, there are some instances, like I mentioned earlier, that we can generate some of our own electricity with backyard contraptions. But it is not enough to move to the 100 percent renewable energy that we would like to do.

I think one of the things that could lead to more affordability—there are some studies—I am not an economics expert, but there are heavy subsidies for fossil fuels still and fewer subsidies for renewable energy. So, if that can help with affordability, that would be great.

And we also need to think about the long-term costs for islands. Maybe it is more affordable to the ratepayer for using fossil fuels today, but we are going to have a lot of infrastructure costs to literally, like, raise the islands—not in my metaphorical sense that I was using earlier, but we will have to build the infrastructure to avoid the rising seas, if that is the way that we continue to view the affordability in the short term versus the long term.

Thank you, Congressman.

Mr. MOORE. Thanks.

And it looks like our time could be up, so I yield back.

The CHAIRMAN. Thank you, Mr. Moore.

The gentleman yields.

Representative Tlaib, you are recognized for 5 minutes. Thank you.

Ms. TLAIB. Thank you, Chairman.

While my district may be far from Puerto Rico or the U.S. Virgin Islands, we have more in common than one might think. My district is full of frontline communities directly exposed to the climate crisis, from what we call the ZIP Code 48217, where the concentration of corporate polluters is literally killing my neighbors, to a city of Dearborn Heights that I share with Congresswoman Dingell, where increased flooding in the Ecorse Creek is threatening people's lives.

The sooner we realize that our fates are all connected and that nobody will be spared by our climate inaction, the sooner we can pass laws like the Insular Area Climate Change Act that take real steps to protect our most vulnerable communities. And it should not be controversial.

Throughout the COVID pandemic, I have been contacted by my mayors in my district who face barriers to using Federal relief funds because of cost-sharing requirements they couldn't meet. And

I know the pain these requirements can pose, so I am glad to see match requirements waived in this bill.

Mr. Oriol, how would waiving the non-Federal cost-sharing requirements truly benefit the people of the Virgin Islands and allow you all to better fight climate change and its effects?

Mr. ORIOL. Thank you for the question, Congresswoman Tlaib.

Even as we speak right now, the Virgin Islands, through the administration of the HUD CDBG-DR grant and the hazard mitigation funding for recovery right now from Hurricanes Irma and Maria require us to have some cost-share. I believe it is 10 percent at this time.

So, when you are talking about a billion dollars in relief aid but needing to come up with that 10 percent match requirement, that is a huge obstacle for a territory with 100,000 residents who are suffering from a pandemic, whose primary revenue source is tourism, and everything has been shut down for over 12 months now.

So, as this will continue, the types of things that the administrators have to grapple with is: How?

Ms. TLAIB. Yes.

Mr. ORIOL. So, cost-share relief, even down to the smaller grants, where it allows us to be able to directly implement some of the strategies that we list with our Federal partners and get those out onto the ground. It is a huge, huge relief, from a very small \$200,000 grant up to our billion-dollar assistance loans.

Ms. TLAIB. I couldn't agree more.

In my district, municipalities have been ravaged by debt. I don't know if you know—the city of Detroit recently went through the biggest municipal bankruptcy in American history. And I saw the impact on my residents. And the city of Inkster in my district lost its entire school district because of outstanding debt.

So, I really do appreciate the leadership of our Chairman.

Mr. Maldonado, one of the President's campaign promises was to forgive disaster relief loans to Puerto Rico, in the municipalities there, so they can recover faster. How would this proposal, which is also included in the bill as Section 601, help Puerto Rico?

And, Mr. Chair, I couldn't see that Mr. Maldonado was still with us. If not, I can proceed.

Mr. MACHARGO. Yes, I am here. Madam, can you repeat the question?

Ms. TLAIB. I was talking about one of the things that our current President had promised was to forgive disaster relief loans to Puerto Rico—and I know we talked a little bit about that—in the municipalities so they can recover faster.

How does this proposal, which is included in the bill as Section 601, how does that really help the Puerto Rican people?

Mr. MACHARGO. Well, we have a situation with the cost-share of the relief programs that are putting some small municipalities through strain, because they don't have the reimbursements, and they don't have the money to start the projects. And we in the local government are being—development like a line of credit so the municipalities can start the project.

But that provision of the bill would greatly help, because we cannot—

Ms. TLAI B. Because time is limited, would you say it truly paralyzes you all from continuing the services and support for the people? Am I correct?

Mr. MACHARGO. Yes. Yes, it does.

Ms. TLAI B. Same thing in the city of Detroit.

I am really just—and bear with me, Chairman. I really want to show just how connected it is, that we can't allow communities to continue to fail like this. We are still seeing the impact of allowing Detroit to go bankrupt, and we can't continue to allow communities across the world to be able to face—especially Puerto Rico and the Virgin Islands. It is really up to us, the United States, to protect them.

So, thank you all so much.

I yield.

The CHAIRMAN. Thank you very much, Representative. I think it is important to make that connection. I am glad that you brought that up. Because sometimes we deal with the issue of climate change in isolation of everything else, and we shouldn't. And I appreciate that.

If there are no further Members that are seeking to be recognized for questions, I do want to thank the witnesses for their testimony. And as I said initially, before I adjourn, that we wanted to bring this as a draft so that we have the opportunity to receive input. And thank you very much to the witnesses for that, and also from our colleagues.

The importance of this piece of legislation can't be underestimated, but also the need to take some action cannot be ignored either. The move toward coming up with some compromise and some bipartisan agreements that will be necessary going forward is important, but the need to take action is also important, and that process will not go on in perpetuity. And our staff will proceed to try to work with you, and I will certainly create outreach with Miss Colón and Mrs. Radewagen to see those areas in which they brought up some issues that we can deal with.

Thank you very much.

Before I close and before we close on the witnesses, there was a report that was issued by the Environmental Defense Fund. It said that Puerto Rico could be considered a canary in the coal mine for climate change because it has been feeling the consequences of a warming world for some time. In fact, the same could be said for all of the islands that we are dealing with today.

Let me ask Ms. Monzón, do you agree with this assessment? And are these specific examples—do you agree with the assessment that the Defense Fund came up with regarding the canary in the coal mine?

If she is still available.

Ms. Monzón?

Mr. ORIOL. She needs to unmute.

The CHAIRMAN. OK.

Ms. MONZÓN. Sorry about that. You got cut off, and I couldn't follow the statement. Could you repeat it, please?

The CHAIRMAN. There was a report issued by the Environmental Defense Fund. When speaking of Puerto Rico, it said: Puerto Rico could be considered as a canary in the coal mine for climate

change, because it has been feeling the consequences of a warming world for some time already. In fact, the same could be said for all the islands that we have been talking about today relative to this legislation.

So, my question simply to you was: Do you agree with that assessment? And I just wanted you to comment on that.

Ms. MONZÓN. Yes, Mr. Grijalva, I agree. No one can be surprised that our island has been subject to the most catastrophic impact of climate change. We are suffering from the coastal erosion; we are suffering from catastrophic hurricanes, one after the other.

Even the health impact that we have had because of these things and also because of the economic development that is stalling in many areas of the island, that means that we definitely—if we can survive, if we can do it right, especially with all the funding that we are receiving in Puerto Rico to build better and safer, definitely we can be the example to America and for the entire planet on how to do it right.

I only agree that we have the advantage of doing something better now than we have ever had. This is a historic moment for Puerto Rico, a historic moment. Thank you.

The CHAIRMAN. I agree. Thank you.

The hearing is adjourned. I appreciate it.

[Whereupon, at 2:31 p.m., the Committee was adjourned.]

