

Testimony of Dr. Shay Bahramirad
Senior Vice President Engineering, Asset Management, Capital Programs at
LUMA

before the

U.S. House of Representatives Committee on Natural Resources
Hearing on Puerto Rico's Post-Disaster Reconstruction & Power Grid
Development

November 17, 2022

I. INTRODUCTION

Chairman Grijalva, Ranking Member Westerman, and members of the Committee:

Thank you for the invitation to appear this morning to discuss the most urgent matter facing the people of Puerto Rico: post-disaster reconstruction and development of Puerto Rico's power grid.

All of us at LUMA, the over 3,000 men and women who work hard every day, and who have dedicated countless hours to restoring power to our customers following the most recent hurricane to make landfall in Puerto Rico: Hurricane Fiona are determined to overcome the profound challenges we inherited from the prior operator and build a more reliable, more resilient, and cleaner energy future for the 3.1 million people we are fortunate to serve.

Throughout this testimony, we will provide the members of this committee with more information on LUMA's preparation and response to Hurricane Fiona, the status of FEMA projects and permanent works, and our ongoing collaboration with the Department of Energy ("DOE") which is accelerating project construction, grid modernization and the transition to sustainable, renewable energy sources.

Furthermore, we will share with you some initiatives we have undertaken to provide further support to our customers, such as LUMA's support for and participation in the Power Stabilization Task Force.

In addition, I will discuss key facts and information regarding the electric grid's historically poor condition prior to our commencement of operations on the island; LUMA's commitment to rebuilding the electric system to higher standards for greater resilience; recommendations for future reconstruction efforts; and our pledge to develop the Puerto Rican workforce who will rebuild the island's energy grid.

Moreover, we will focus on the challenges that have emerged following decades of mismanagement by the Puerto Rico Electric Power Authority, which filed for bankruptcy relief in July 2017. The dispute over \$9 billion of outstanding debt, which is still ongoing after 5 years, has severely limited the ability to fully transform the electric system.

Lastly, all of us at LUMA fully embrace the profound responsibility we have to respond to emergency situations and build a more resilient electric grid. With the support of FEMA, the Puerto Rican government, Congress, and other partners, we will build the energy future that the people of Puerto Rico deserve.

II. EMERGENCY PREPAREDNESS AND THE RESPONSE TO HURRICANE FIONA

LUMA's emergency response to Hurricane Fiona follows a 15-month effort to overcome years – if not decades – of profound operational neglect and lack of maintenance by the previous operator. Even before starting operations, LUMA focused intensely on preparing for an event like Hurricane Fiona, ensuring that personnel received over 10,000 hours in emergency response training on FEMA's National Incident Management System and fully outfitting field crews with proper safety equipment and roadworthy vehicles—conditions that were absent under the previous operator.

On and around September 14, 2022, LUMA activated its emergency operations center and began formal preparations for what became a powerful and devastating Category 1 hurricane, that included 100 mph winds, over 30 inches of rain, severe flooding, and widespread damage to local infrastructure and electric infrastructure. LUMA's advance work and close coordination with Puerto Rico and federal emergency response agencies, as well as local communities, allowed a restoration of electric service to 90% of customers within 12 days of Hurricane Fiona making landfall—a restoration timeline never seen before in Puerto Rico for a hurricane, and on par with restoration times for similar events in other jurisdictions in the continental US.

These preparations included the following:

- Activating the LUMA Emergency Operations Center and deploying company representatives to the central government's Emergency Operations Center, as indicated in LUMA's Emergency Response Plan (ERP);
- Mobilizing 1,300 field workers, including lineworkers and substation technicians, who are trained and available to respond to serious emergencies;
- Maintaining our 1,800 fleet units fueled and ready to deploy for emergency response;
- Keeping the \$130 million inventory of transmission and distribution material available and on-hand to respond to emergency events (more than five times the inventory that was on the island immediately prior to Hurricane Maria);
- Deferring all planned reliability work in order to prioritize and dedicate all available resources to storm response;
- Coordinating with the Puerto Rico Emergency Management Bureau (PREMB), the Puerto Rico Electric Power Authority (PREPA), FEMA, the U.S. Department of Energy Support Function #12 Annex (ESF #12 Annex) and other government agencies to coordinate a unified response;
- Conducting proactive outreach to essential service providers like hospitals;

- Coordinating restoration work to prioritize Community Lifelines, including health, safety, transportation and communications facilities; and
- Pre-deploying equipment and resources in Puerto Rico to respond to possible impacts from the storm and maintaining contact with mutual aid providers so that in the event of the need for additional response resources, the Caribbean Electric Utility Services Corporation (CARILEC), the Edison Electric Institute (EEI) and the American Public Power Association (APPA) can provide assistance with restoration efforts.

The grid in Puerto Rico, already fragile, was severely damaged by Hurricane Fiona, especially in the Ponce, Mayagüez and some of the central highland regions that suffered severe damage to roads and critical infrastructure. As you know, the electric system consists of 1) energy generation, which is the responsibility of third parties, including PREPA, and 2) the transmission and distribution of energy, which is the responsibility of LUMA.

On the transmission and distribution system:

- 30% of transmission line segments sustained damage
- 54% of distribution feeders sustained damage
- Seven substations experienced severe flooding (submerged in water) or were rendered inaccessible
- The result was an island-wide blackout leading to more than 1.4 million customers experiencing outages

LUMA deployed more than 2,500 utility workers and more than 2,500 vehicles, including seven helicopters, to restore the grid. These helicopters performed over 239 total flight hours, flying over 12,000 miles of coverage area.

- These workers included LUMA's normal workforce, seven local contractor companies, and those LUMA was able to leverage from Quanta Services, one of its parent companies, which deployed 221 employees, 56 bucket trucks, and 22 diggers.
- These workers were directed from six regional operations centers, which were overseen by a centralized LUMA Emergency Operations Center, which coordinated with the System Operations Control Center in San Juan and a mobile emergency operations center in Guayanilla on the southern coast.

As part of a coordinated communications strategy, LUMA kept the public informed throughout the emergency by providing the following:

- 435 total updates, including press releases, official statements, and interviews on television and the radio, on hurricane response and disaster recovery efforts
- 1,759 announcements on radio
- 1,135 social media updates
- 34 videos posted online showing extent of damages and ongoing recovery efforts

- All of this work led to restoring 90% of customers within 12 days of hurricane landfall

In addition, as part of our commitment to transparency, on October 21, 2022, LUMA publicly provided a document titled *Hurricane Fiona Response and Restoration Event Summary*, with responsive statistical information regarding the response to the emergency related to the passing of Hurricane Fiona through Puerto Rico. We believe that this summary represents the most comprehensive collection of restoration information ever provided to the public so soon following a hurricane in Puerto R

III. STATUS OF FEMA FUNDED RECONSTRUCTION PROJECTS

When LUMA assumed operations of Puerto Rico's transmission and distribution system, one of our highest priorities was to work together with FEMA, the Puerto Rico Energy Bureau, the Puerto Rico Public-Private Partnerships Authority, the Central Office for Recovery, Reconstruction and Resiliency (COR3), and the Puerto Rico Electric Power Authority (PREPA) to develop and advance a series of federally funded infrastructure improvement projects to transform and modernize Puerto Rico's energy system.

During the past 17 months, LUMA has been able to advance FEMA projects in Puerto Rico at a historic pace – a stark comparison to the previous five years under the prior operator.

A. FEMA Reconstruction Projects

As of November 1, 2022, LUMA has initiated 251 projects with FEMA, representing more than \$6.2 billion worth of federally funded projects. In contrast, only 37 project submissions had even been made (and not one project had a preliminary design) before LUMA assumed operations on June 1, 2021.

- **Obligated FEMA Projects.** LUMA has received, to date, FEMA approval for 38 critical infrastructure projects¹ including:
 - Twenty-eight local distribution projects that will address critical infrastructure, such as streetlights and pole replacement, targeting the municipalities of San Juan, Arecibo, Mayaguez, Caguas, Bayamón and Carolina to reduce outages and increase the reliability of the electric system.
 - Four regional transmission reconstruction projects that will help improve the high-voltage critical energy infrastructure that delivers energy across the island.
 - Five substation modernization projects that will address the pivotal role played by substations in helping deliver energy to communities across Puerto Rico beginning in the municipalities of San Juan, Vieques, Culebra, Manatí, and Guayanilla.

- One critical Emergency Management System (EMS), which is the first phase of transforming the system operations control center with state-of-the-art technology and software to modernize the way Puerto Rico's energy grid is monitored and managed.
- **FEMA Projects Under Construction.** LUMA has started construction on 23 FEMA-funded projects across Puerto Rico including:
 - Six initial streetlight projects as part of LUMA's \$1 billion Community Streetlight Initiative in the municipalities of Guánica, Lajas, Aguada, Maunabo, Luquillo, and Villalba, where in less than three months, LUMA has installed over 15,000 streetlights.
 - One critical transmission line repair project to improve the grid's resiliency.
 - Sixteen distribution pole replacement projects to increase the reliability of the electric grid.

In addition to the projects initiated, approved, and under construction, LUMA has also taken the following FEMA-related actions:

- Received approval for \$656 million to procure material that requires long lead times for manufacturing and delivery, mainly grid equipment including breakers, transformers, and reclosers.
- Developed four proposals for Hazard Mitigation for non-damaged infrastructure under Section 404 of the Stafford Act which would represent \$900 million for grid modernization, including an advanced metering infrastructure, an advanced microgrid project, and mobile microgrids to enable renewable energy and make communities more resilient in the face of system-wide disturbances.
- Working with FEMA to get support for the immediate addressing of Fiona-related damages with permanent work

Taken in totality, over the coming months and years, FEMA-funded projects that are being directed by LUMA will be not only the largest capital energy program in Puerto Rico's history, but also the largest ever funded by the federal government to repair and rebuild an electric system across any state and/or territory. As a result, LUMA is excited by the significant progress that has been made to date that will, as more FEMA projects begin construction, provide Puerto Ricans with a stronger, transformed energy grid.

B. Working Closely with FEMA on Emergency Preparedness

In addition to moving forward critical federally funded infrastructure projects, LUMA continues to prioritize emergency preparedness and taking the necessary steps and actions to be able to respond to hurricanes and other emergencies.

Given the historic impact of recent hurricanes and the lasting effects it has had on the people of Puerto Rico, LUMA has made preparing for emergency events a daily and year-round priority.

As part of our emergency preparedness efforts, we have worked closely with FEMA, PREMB, DOE ESF 12, and other partners to establish and adopt industry emergency preparedness standards. Among the actions we have taken include the following:

- **Establish Emergency Response Plan.** In May, LUMA submitted its 2022 Emergency Response Plan (ERP) to the Puerto Rico Energy Bureau as part of its continuous effort to plan, prepare for and respond to the major emergencies and the 2022 hurricane season.
 - LUMA's 2022 ERP outlines the actions LUMA takes in an emergency event and helps direct the company's response, recovery, and restoration efforts.
 - More specifically, the ERP addresses how LUMA responds to any emergency, including hurricanes, earthquakes or any other major event that impacts the electric power system.
- **Adopt Industry Best Practices.** The LUMA ERP follows industry best practices for emergency response and follows the National Incident Management System as established by FEMA.
 - The National Incident Management System framework establishes a standardized Incident Command System (ICS) which is used across industries and is the basis for LUMA's ERP.
- **Emergency Preparedness, Training & Readiness.** LUMA has undertaken extensive efforts to improve preparedness, training, and readiness, including:
 - **Emergency Preparedness:**
 - Three emergency preparedness tabletop exercises completed with FEMA and DOE/ESF 12/PREPA/PREMB and other local stakeholders.
 - Procuring and maintaining a fleet of more than 1,800 vehicles available to support emergency response efforts.
 - Installing equipment in the LUMA Emergency Operations Center and purchasing supplies for emergency operations.
 - **Emergency Training:**
 - Completing more than 10,000 hours of ICS training.
 - Completing an Emergency Operations Center mock drill based on Category 4 Hurricane making landfall on May 12, 2022, with 75 attendees.

- Emergency Readiness:
 - To date, LUMA maintains a total on-hand inventory of T&D equipment and materials available for daily operations and emergencies amounting to \$130 million including:
 - 19,000 poles
 - 18 million feet of cables
 - 2,545 transformers
 - 53,000 LED luminaries
 - 135,000 insulators
 - 7,800 switches/breakers
 - 30,100 crossarms
 - As part of our more than 3,000 employees, LUMA has 1,300 transmission and distribution workers across Puerto Rico who are trained and available to respond to serious emergencies, in addition to resources from contractors and mutual aid.
 - We also have established mutual aid agreements with the CARILEC, EEI and the APPA for response to critical events in cases where additional resources for restoration and response become necessary.
 - We have also been working with US DOE on development of a Storm Damage Prediction Tool for estimating material needs. The Storm Damage Prediction Tool helps forecast storm damage to transmission and distribution infrastructure.

C. Collaboration with DOE, FEMA, and COR3 in Accelerating Reconstruction

As part of our commitment to immediately addressing the lack of sufficient, dependable power generation in Puerto Rico, LUMA is participating and actively supporting the Power Stabilization Task Force led by FEMA. Together with federal and Puerto Rico agencies, we have been working to improve performance on a series of critical areas.

- *Global/Flexible Match*
 - The US DOE is collaborating with FEMA and HUD, to issue a letter to COR3 that would formally approve the use of funds to provide projects that would serve as cost share in terms of a global and flexible match
 - Ongoing collaboration efforts are being discussed to evaluate how several individual projects can serve a larger goal
- *Working Capital Advance*

- We're working with COR3 to be able to leverage additional FEMA funds in order to purchase equipment ahead of time and mitigate any potential supply chain problems that may arise
- LUMA is also working with FEMA and COR3 to increase the proportion of project cost that could be provided in advance from the current 25% to 50%
- *Environmental and Historical Preservation (EHP) Review Process Efficiencies*
 - We are working with FEMA and our partners in the Puerto Rico government, to align on ways to streamline the EHP process, including better aligning of the EHP reviews with existing processes at the federal and territorial level and supporting reciprocity between different governmental agencies
 - Additionally, we are collaborating with FEMA on conducting the EHP review on a programmatic level where applicable, rather than on individual projects
- *Hazard Mitigation Strategy*
 - We are currently undertaking efforts with FEMA and stakeholders to recognize the importance of “vegetation reset” as a hazard mitigation strategy, which can have a transformational impact on the reliability and resiliency of the grid, as well as limit future damages on grid equipment
 - We are also looking more broadly for a holistic, island-wide perspective on leveraging Section 406 hazard mitigation funds to maximum effect
- *Community Development Block Grant- Disaster Recovery (CDBG-DR) Electric Power Reliability and Resilience Program (ER2)*
 - We are working with stakeholders as well as the Puerto Rico Department of Housing, COR3, DOE, and HUD, to finalize program guidelines to enable the most impactful deployment of distributed technologies, including microgrids
 - We are supporting advanced microgrid projects to serve areas such as the Centro Medico, which represents critical customers for San Juan and the entire island

IV. HISTORICAL PERSPECTIVE OF PUERTO RICO'S ELECTRIC GRID

To understand the dynamics surrounding our mission to transform Puerto Rico's transmission and distribution system one must first start to analyze the electric grid's condition prior to LUMA beginning operations on the island. As has been documented publicly, Puerto Rico's electrical grid suffered from years and decades of neglect and mismanagement under the past utility operator. These profound operational failures

severely impact all areas of the energy system and represent an ongoing challenge that LUMA remains determined to confront and overcome.

With respect to the state of infrastructure that LUMA inherited 17 months ago, the following are just some examples of the conditions that were faced:

- **Poor Substations:** 30% of transmission and distribution substations, key nodes in the electric grid, were estimated to require safety and hazard mitigation to reach remediation.
- **Poor T&D Assets:** An estimated 20% of transmission and distribution line assets, including poles and wires, required safety and hazard mitigation to reach remediation.
- **Public Safety Hazards:** Approximately 50,000 streetlights, more than 10% of all of the streetlights on the island, were estimated to be physical and public safety hazards.
- **Lack of Sound Engineering & Planning:** Processes for engineering functions such as distribution planning, transmission planning, protection and coordination were lacking and not following industry standards. For example, a proper simulation model for the Island's transmission system did not exist to properly design the system.
- **Antiquated EMS:** The Energy Management System (EMS), a primary technology to facilitate the stable grid operations, had been purchased in the mid-1990s, poorly maintained and was no longer supported by the vendor. We found that PREPA had procured spare parts from eBay.
- **Lack of Safety Requirements:** The entire ground and air fleet used for utility operations did not meet U.S. Department of Transportation safety requirements.
- **Lack of Critical Maintenance:** Recommended baseline maintenance of transmission and substation assets were not completed, and manufacturers' guidelines were not followed.
- **Poor Vegetation Management:** Vegetation management was often delayed by PREPA, and vegetation was present and evident when visiting substations, as well as lines and feeders.
- **Lasting Impact of Hurricane Maria:** Hurricane Maria accelerated this deterioration and highlighted the flaws in legacy design, operation, and maintenance activities. Some customers didn't have power for more than a year after Hurricane Maria, which is unacceptable.

These facts, while significant in scope and impact, do not come close to fully capturing the truly weakened and deteriorated state of the electric grid. As LUMA has documented through photographic evidence that has been provided to the Committee, the T&D system inherited by LUMA was weakened by years, if not decades, of poor design, maintenance,

lack of proper inspections, and other profound failures that continue to impact the stability and reliability of the energy system.

As a measure of the fragile and weakened nature of the energy grid, Puerto Rico has experienced a number of large-scale outage events since 2016 – five of which preceded a similar large outage event on April 6 of 2022:

- September 21, 2016 – Due to fire at Aguirre Power Generating Plant
- April 12, 2018 – Due to vegetation
- April 18, 2018 – Due to transmission repairs
- January 7, 2020 – Due to earthquake on the island
- July 28, 2020 – Due to vegetation / equipment failure

Each of these events affected more than 500,000 customers and restoration efforts lasted for longer than three days. This history of such events underscores how deeply fragile and severely vulnerable Puerto Rico's electric grid and critical infrastructure has been because of the failures of the past operator and reinforces the need for LUMA to remain focused on the fundamental improvements needed to modernize and transform the energy system.

V. LUMA'S COMMITMENT TO COMPLETE REPAIRS TO UPGRADED STANDARDS AND IN A PERMANENT MANNER

Given the need to address these past infrastructure failures and overall fragility of the energy grid, LUMA takes very seriously the need to improve the reliability and resiliency of Puerto Rico's transmission and distribution system. Accordingly, we have implemented a markedly different approach that is grounded in data, rigorous engineering, sound planning aligned with modern industry standards, and transparency about the progress being conducted and the challenges that are being faced. Given this approach, and in spite of the challenges we have faced, LUMA has made substantial progress across key areas, including:

- **Improving Reliability (Reducing the Number of Outages Experienced):**
 - The System Average Interruption Frequency Index (SAIFI), or the number of outages that an average customer experiences in a year, has been reduced by 30% (improvement from a PREPA baseline of 10.6 to 7.6).
 - What this means is that instead of an average customer experiencing 10.6 outages in a year, they're experiencing 7.6.
 - 15% fewer substation events than in PREPA's last year.
 - Restored and re-energized two transmission lines that were out since Hurricane Maria, and two additional lines that were out since before Hurricane Maria, representing 43 miles of transmission lines.
 - Restored and re-energized 5 substations that had been out since Hurricane Maria.

- Restored and re-energized 496 pieces of equipment, including in substations and on the transmission and distribution systems.
- **Empowering the Growth of Solar/Clean Energy/Renewables:**
 - Before LUMA began operations, there was a severe backlog of customers who had applied for inclusion in PREPA's solar net-metering program and were waiting to install rooftop solar.
 - We have successfully reduced this backlog and have now integrated more than 36,000 customers to the program, which is more than the previous ten years under PREPA.
 - In a little over a year, LUMA added more customers to the residential solar program than PREPA ever did over a full decade. Average time for approval of interconnection has dropped to under 30 days.
 - Completed studies to support the interconnection of more than 1300 MW of renewable utility-scale generation and completed solar hosting capacity analyses.
 - Completed cutting-edge optimization analysis to identify locations in the system with zero network upgrade cost for affordable and economical renewable energy integration.
 - We have gone from approximately 450 distributed generation interconnections monthly to approximately 2,200 interconnections per month. Through our accelerated program, LUMA added more residential solar for customers in 15 months than the previous operator did over a whole decade.
 - Reenergized transmission line that was out of service since Hurricane Maria connecting a 27 MW wind farm to the system.
- **Improving Customer Service:**
 - 1.5 million customers have been provided support by LUMA, through more than 5 million calls, 400K+ e-mails, 650K+ direct messages on social media
 - The average wait time of customers on the phone decreased from more than 10 minutes while under PREPA to approximately 5 minutes under LUMA.
 - The rate of call abandonment declined from more than 50% with PREPA to 18% under LUMA.
 - 750,000+ downloads of MiLUMA application.

- **Improving Workplace Safety & Trainings:**

- Developed procedures to support the operation of interconnected generation resources, the reliable dispatch of power, black start² and restoration, as well as numerous other critical operations. These procedures did not exist prior to our arrival as operator of the T&D system.
- We have renewed the service fleet with 1,200 new or repaired vehicles, fully compliant with safety and transportation requirements.
- Graduated the first class of Puerto Rican electric line workers from LUMA Technical College, with subsequent graduating classes during the last year.
- Total recordable injury rate went from 8.63 under PREPA to 2.88 under LUMA.

Injury severity rate declined from 62.9 under PREPA to 11.64 under LUMA.

VI. LUMA'S INVESTMENT & COMMITMENT TO WORKFORCE DEVELOPMENT THROUGH LUMA TECHNICAL COLLEGE

From the very beginning of this process, LUMA has demonstrated a unique commitment to (i) training and knowledge transfer, as evidenced by LUMA's pledge to build and manage, at its cost and expense, a lineworkers college in Puerto Rico (the "LUMA Technical College").

Founded by Quanta Services and ATCO, LUMA College for Technical Training is modeled after Quanta's educational institution Northwest Lineman College. The Northwest Lineman College (NLC) is an industry-leading educational institution that provides safety and certification training in the power delivery, natural gas, and telecommunications industries. NLC offers complete solutions from entry-level career programs to advanced industry training and has remained committed to doing what's best for the student for more than 25 years.

The LUMA Technical College offers a 13-week Utility Lineworker Program. Through this 13-week pre-apprentice training program, trainees acquire the knowledge, skill and behaviors that prepare them to be a highly valuable entry-level lineworker. Using the Three-Phase Educational Model, LUMA Technical College focuses on education around three domains of learning: Knowledge, Skill and Behavior. Each academic course, skill competency, and behavior expectation is shaped by this model.

VII. LUMA'S COMMITMENT TO ENERGY AFFORDABILITY VS. RISING GENERATION FUEL COSTS AND DETERIORATING DEPENDABILITY OF GENERATION FLEET

² Black start refers to restarting the grid after an island-wide blackout. The other procedures referenced above are related to managing energy generation to provide reliable power.

It is important to make clear that LUMA has NEVER proposed an increase to the base rate that covers the operation of the T&D system. While there have been increases in electricity rates approved by the PREB over the past year, it is important to understand that these increases have been solely due to increases in generation fuel costs.

LUMA's base rate has not changed, and spending has not increased since June 2021. In general, customers' charges are composed of the following:

- 1) **Base Rate** – These revenues fund the O&M and non-federally funded capital costs for the T&D System and Generation. Revenues fund LUMA and PREPA's operating and capital costs.
- 2) **Fuel Charge** – These revenues fund PREPA's fuel purchases. This fuel is purchased for PREPA's generating plants and EcoEléctrica. This is reconciled quarterly. Revenues fund fuel suppliers for fuel delivered to PREPA.
- 3) **Purchased Power Charge** – These revenues fund payments required under Purchase Power Agreements between PREPA and Independent Power Producers. This is reconciled quarterly. Revenues fund Independent Power Producers for electricity provided to the T&D System.
- 4) **Subsidies, Contribution in Lieu of Taxes** – These revenues fund subsidy programs and power provided to municipalities in lieu of taxes. This is reconciled annually.

As part of LUMA's responsibilities under the T&D OMA, LUMA submits calculations for any adjustment to customers rates, regardless of what expenses the revenues fund. The PREB reviews and approves all rate changes before they are implemented.

As part of the above requirement, LUMA files calculations related to Fuel and Purchased Power on a quarterly basis and calculations related to Subsidies and Contribution in Lieu of Taxes on an annual basis (in June of every year).

Since June 2021, LUMA has not applied for changes to the Base Rate, the only source of revenue for LUMA managed expenses. In other words, LUMA has NEVER proposed a rate increase at any time since taking over operations.

As previously mentioned, the sole driver of electricity rate increases since June 2021 has been related to generation related fuel prices used by PREPA and other generators to produce electricity. While some have suggested otherwise, the fact is that LUMA, as we have stated repeatedly in regulatory filings and in public statements, does not generate energy, is not responsible for rate increases associated with generation, nor have we ever proposed a change to the T&D base rate.

As is well documented, global fuel prices have materially increased since June 2021. West Texas Intermediate (WTI) has increased 76% from \$65.17/bbl in May 2021 (before LUMA commenced O&M Services) to \$114.84/bbl in June 2022 and Henry Hub (HH)

increased 165% from \$2.91/MMBtu in May 2021 (before LUMA commenced O&M Services) to \$7.70/ MMBtu in June 2022.

Please note procurement of fuel and management of fuel costs are managed by PREPA. All revenues collected from FCA go to pay fuel costs incurred by PREPA – and are not associated with LUMA.

VIII. OUTAGE REDUCTION EFFORTS

All of us at LUMA share our customers' frustration with outages and the reliability of Puerto Rico's fragile electric system, which has suffered from years – if not decades – of mismanagement and neglect.

To address these sincere concerns, LUMA has undertaken a series of additional actions to build on the progress we have made, reduce the impact of outage events, and improve our response when such outages occur. Among the actions include:

- **Increased utility and vegetation crew numbers** by onboarding 201 additional highly trained utility workers to help improve overall outage response and target areas for reliability improvement.
- **Installed 64 new automation devices** all across Puerto Rico. These are innovative devices used to detect outages within milliseconds, shorten outage duration and reduce the number of customers that experience an outage.
- **Cleared hazardous vegetation** from 400 miles of critical lines identified as impacting frequent outages, in addition to the 900 miles cleared of vegetation this year across transmission and distribution powerlines.
- **Completed critical aerial inspections and thermal imaging of 262 miles of key lines** using special thermography equipment used to inspect key equipment.
- **Completed inspections and performed thermal imaging of 341 critical substations.**

In response to Hurricane Fiona and ongoing infrastructure challenges, LUMA will continue to take additional actions and expand on current programs and efforts in order to improve the reliability of the energy grid.

The legal framework for the electric sector in Puerto Rico establishes clear roles for different participants in the electric sector. Generators, including PREPA and independent producers, are responsible for operation and maintenance of the power plants, while LUMA is responsible for the operation of the transmission and distribution system as well as overall system coordination, planning and analysis. To be clear, LUMA's customers

are critically dependent on the performance of PREPA's power plants that make up over 70% of the generation fleet to meet expected customer demand.

The challenges posed by the poor state of the generation assets have long impacted – and continue to impact – the reliability of the energy grid. For example:

- As a result of PREPA's poor and declining generation plant reliability, the Puerto Rico electrical system had less than the minimum required reserve margin during 33 percent of the time during the past year.
- Though the minimum industry benchmark target standard for planning is that generation should result in load being shed, or customers losing power, 0.1 days per year, a resource adequacy analysis found that in Puerto Rico, after the damage of Hurricane Fiona, the expectation is that without mitigation, it could occur on 50 days per year, which is 500 times higher than the planning standard for North American utilities.
- Generation has caused load shed on 37 separate days since LUMA commenced service.

IX. CONCLUSION

Looking forward, it is more important than ever that all of us work together to achieve what the Puerto Rican people deserve given the many hardships they have suffered from poor financial and operational stewardship under the past operator: a better energy future that moves Puerto Rico forward. In the face of ongoing challenges, all of us at LUMA – the more than 3,000 women and men of our workforce – remain more committed than ever to this goal.

By working together, we believe that the energy future that LUMA is building in Puerto Rico will, over the coming months and years, close the chapter on the failures of the past operator and usher in a new era in which the energy grid is not only more reliable and more resilient, but serves the energy needs of Puerto Rico for generations to come.