



HOUSE COMMITTEE ON
NATURAL RESOURCES
CHAIRMAN BRUCE WESTERMAN

To: House Committee on Natural Resources Republican Members
From: Indian and Insular Affairs Subcommittee staff: Ken Degenfelder (Ken.Degenfelder@mail.house.gov), and Justin Rhee (Justin.Rhee@mail.house.gov), x6-9725
Date: Thursday, September 26, 2024
Subject: Oversight Hearing: “*Examining Puerto Rico’s Electrical Grid and the Need for Reliable and Resilient Energy*”

The Subcommittee on Indian and Insular Affairs will hold an oversight hearing titled “*Examining Puerto Rico’s Electrical Grid and the Need for Reliable and Resilient Energy*” on **Thursday, September 26, 2024, at 10:00 a.m. in 1324 Longworth House Office Building.**

Member offices are requested to notify Haig Kadian (Haig.Kadian@mail.house.gov) by 4:30 p.m. (EDT) on Wednesday, September 25, 2024, if their member intends to participate in the hearing.

I. KEY MESSAGES

- Puerto Rico’s residents deserve access to affordable, reliable, and resilient energy, particularly as the island’s residents pay among the highest utility costs in the U.S. The continued instability of the electrical grid is a barrier to short and long-term economic growth.
- The transfer of management of Puerto Rico’s electrical grid from the Puerto Rico government-controlled entity, the Puerto Rico Electricity Power Authority (PREPA), to private utility firms LUMA Energy (LUMA) and Genera PR (Genera) was a step in the right direction. However, LUMA and Genera are responsible for explaining recent blackouts and must do better to increase transparency and communication.
- The Biden-Harris administration's priority of renewables such as solar and wind over reliable sources of base load power is unsustainable for Puerto Rico. The administration is placing its political agenda over the island's practical realities and is putting the livelihood of the 3.2 million residents at risk.
- It is alarming that the U.S. Department of Energy (DOE), the Federal Emergency Management Agency (FEMA), and the U.S. Housing and Urban Development Agency (HUD), the primary U.S. agencies charged with assisting Puerto Rico in rebuilding their electrical grid, have elected to ignore the practical realities on the island and instead have prioritized renewable energy projects. Furthermore, despite providing ample notice, these agencies have declined to testify before the Committee.

II. WITNESSES

PANEL I:

- **The Hon. Deanne Criswell**, Administrator, Federal Emergency Management Agency, U.S. Department of Homeland Security, Washington, D.C. [*Declined to testify*]
- **The Hon. Jennifer M. Granholm**, Secretary, U.S. Department of Energy, Washington, D.C. [*Declined to testify*]
- **The Hon. Adrienne Todman**, Acting Secretary, U.S. Department of Housing and Urban Development, Washington, D.C. [*Declined to testify*]

PANEL II:

- **Mr. Manuel Laboy Rivera**, Executive Director, Central Office for Recovery, Reconstruction, and Resiliency, San Juan, Puerto Rico
- **Mr. Antonio Torres Miranda**, Associate Commissioner, Puerto Rico Energy Bureau, San Juan, Puerto Rico
- **Mr. Juan Saca**, Chief Executive Officer, LUMA Energy, San Juan, Puerto Rico
- **Mr. Brannen McElmurray**, Chief Executive Officer, Genera PR LLC, San Juan, Puerto Rico

III. BACKGROUND

This hearing will examine Puerto Rico’s electrical grid and the need for reliable and resilient energy on the island. Puerto Rico’s electrical grid is undergoing major rebuilding following its collapse from natural disasters in 2017 and 2022 and, most recently, hurricane Ernesto in 2024. The government of Puerto Rico is also continuing to undergo an extensive debt restructuring process established under the *Puerto Rico Oversight, Management, and Economic Stability Act* (PROMESA).¹

As part of the debt restructuring process, the Puerto Rico Electric Power Authority (PREPA), Puerto Rico’s original electrical utility and a public corporation of the Government of Puerto Rico, has undergone and continues to undergo a significant overhaul of its management, operations, and finances. This overhaul includes entering into public-private partnerships that privatize the management of a majority of PREPA’s assets. PREPA’s control over electrical transmission and distribution (T&D) in Puerto Rico and its customer-facing service offices were contracted to LUMA in 2021.² PREPA’s operation and maintenance of its thermal generation assets was contracted with Genera in 2023.³

Over the past three years, there has been broad dissatisfaction and protests against LUMA related to many power outages, rising electricity rates, and a perceived lack of customer service.⁴ The

¹ P.L. 114-187. For more information on PROMESA and Puerto Rico’s debt restructuring process, see: “Puerto Rico’s Public Debts: Accumulation and Restructuring.” Congressional Research Service, <https://crsreports.congress.gov/product/pdf/R/R46788/5>.

² Coto, Danica. “Private Company Takes over Puerto Rico Power Utility Service.” AP News, June 1, 2021. <https://apnews.com/article/caribbean-puerto-rico-business-135b9ec52e130f3716f8862021a524d4>.

³ Acevedo, Nicole. “Puerto Rico officially privatizes power generation amid protests, doubts.” NBC News, January 25, 2023. <https://www.nbcnews.com/news/latino/puerto-rico-officially-privatizes-power-generation-genera-pr-rcna67284>.

⁴ New Lines Magazine. A Private Company Provokes an Energy Crisis in Puerto Rico. <https://newlinesmag.com/reportage/a-private-company-provokes-an-energy-crisis-in-puerto-rico/>.

power outages have been significant in both frequency and duration.⁵ While LUMA bears responsibility for addressing customer concerns and the seeming lack of improvement to the electrical grid, placing sole blame on LUMA for the island's energy woes ignores the legacy issues of PREPA's mismanagement of finances, past underinvestment in infrastructure across system, the fragility of Puerto Rico's aging power generation fleet, and the role of federal agencies in supporting the island's electrical grid.

Federal agencies have obligated over \$21 billion in assistance for energy reconstruction projects on the island, but much of this funding has yet to be disbursed due to delays in the grant awarding process and project execution.⁶

As Puerto Rico is particularly prone to natural disasters, recent power outages have amplified concerns of a major collapse in the electrical grid and rippling effects on water supply and critical infrastructure.⁷ These concerns have been exacerbated amid the annual hurricane season. In light of these concerns, this hearing will assess the progress made by LUMA and Genera, the role of federal agencies, and the policy recommendations for ensuring Puerto Rico has access to reliable and resilient energy.

Overview of Puerto Rico and Recent Natural Disasters

The Commonwealth of Puerto Rico is a self-governing, unincorporated island territory of the United States located on the easternmost island of the Greater Antilles chain.⁸ San Juan, the capital, is located on the island's northern coast.⁹

The island is less than 100 miles south of the Puerto Rico Trench, which descends to more than 5 miles below sea level and is the deepest point of the Atlantic.¹⁰ This feature leads to continuing tectonic movement and earthquakes that affect Puerto Rico, including earthquakes that occurred in late 2019 through the beginning of 2020.¹¹

In addition to earthquakes, Puerto Rico is particularly prone to hurricanes. The September 2017 hurricanes, Irma and Maria, passed over Puerto Rico and left massive damage in their wake.¹² The hurricanes knocked out 80% of Puerto Rico's power grid,¹³ taking eleven months for power to be fully restored, the longest blackout in U.S. history.¹⁴ It is estimated that 3.4 million Puerto

⁵ Id.

⁶ Information provided by the Congressional Research Service upon request by House Committee on Natural Resources GOP staff.

⁷ Simpkins, Kelsey. "Puerto Rico's precarious relationship between power and water." University of Colorado Boulder.

<https://www.colorado.edu/today/2022/09/30/puerto-ricos-precarious-relationship-between-power-and-water>.

⁸ Puerto Rico, *Britannica*. <https://www.britannica.com/place/Puerto-Rico>.

⁹ San Juan Puerto Rico, *Britannica*. <https://www.britannica.com/place/San-Juan-Puerto-Rico>.

¹⁰ Id.

¹¹ Grace Hauck, "Magnitude 5.9 earthquake rocks Puerto Rico and causes landslide in Peñuelas" *USA Today*. Jan 23 2020 <https://www.usatoday.com/story/news/world/2020/01/11/puerto-rico-earthquake-6-0-magnitude-quake-causes-damage-ponce/4441511002/>.

¹² Hurricanes Irma and María, *Official Portal of the Government of Puerto Rico*, <https://recovery.pr.gov/en/hurricanes>.

¹³ Murali Baggu, *Puerto Rico Grid and Recovery Post Hurricane Maria*, Institute of Electrical and Electronics Engineers, <https://www.nrel.gov/docs/fy22osti/82860.pdf>, p. 2.

¹⁴ GAO Watch Blog, "Hurricane Recovery Can Take Years—But For Puerto Rico, 5 Years Show Its Unique Challenges." Nov 14th, 2022. <https://www.gao.gov/blog/hurricane-recovery-can-take-years-puerto-rico-5-years-show-its-unique-challenges>.

Rican residents were left without power for months,¹⁵ and over a million homes were damaged.¹⁶ In addition to the electricity grid, Puerto Rico's roads, hospitals, schools, businesses, water systems, and other critical systems were severely affected.¹⁷ Seven years later, Puerto Rico is still recovering from the effects of these hurricanes.¹⁸

On September 18, 2022, Tropical Storm Fiona strengthened into a category one hurricane as it made landfall on the southern part of Puerto Rico.¹⁹ The effects of winds and rain on key electric transmission and distribution lines caused the electrical grid to go down and generation to go offline as a safeguard, with all 3.2 million residents losing power. On October 14, 2022, LUMA announced restoration of power to the 1.46 million customers who lost power, and that it was demobilizing their emergency posture put in place after Hurricane Fiona hit the island.²⁰ It took LUMA 26 days to return electrical service to Puerto Rico.²¹ For comparison, after Hurricane Maria, some parts of the island were without power for over a year under PREPA control.²²

Primary Stakeholders of Puerto Rico's Energy Reconstruction

PREPA

Formed in 1941, PREPA was a public corporation owned by the Commonwealth of Puerto Rico.²³ As a government-controlled entity, the impression of many was that leadership posts at PREPA were coveted patronage jobs believed to be held by individuals who were unqualified to hold these positions, contributing to the inefficiency of operations.²⁴ For decades, PREPA was plagued by mismanagement, inefficiency, political cronyism, and a lack of transparency.²⁵ The utility has a record of unacceptable rates of electricity theft, failure to collect accounts from government and municipal users, and a history of continually foregoing critical maintenance of the island's electrical infrastructure.²⁶

For further information on PREPA's history, ongoing reforms, and debt restructuring, see the November 17, 2022, House Committee on Natural Resources Republicans full committee oversight hearing memo.²⁷

¹⁵ Peter Anagnostakos et al., *Banks versus Hurricanes: A Case Study of Puerto Rico after Hurricanes Irma and Maria*, Federal Reserve Bank of New York, No. 1078 Nov 2023, https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1078.pdf, p. 1.

¹⁶ Hurricanes Irma and Maria, *Official Portal of the Government of Puerto Rico*, <https://recovery.pr.gov/en/hurricanes>.

¹⁷ Government Accountability Office, "Puerto Rico Disasters: Progress Made, but the Recovery Continues to Face Challenges." Feb 13, 2024. <https://www.gao.gov/products/gao-24-105557>.

¹⁸ Id.

¹⁹ Matthew Cappucci, et. al. "All of Puerto Rico without power as Hurricane Fiona slams island." *Washington Post*. Sept. 18, 2022. <https://www.washingtonpost.com/climate-environment/2022/09/18/fiona-puerto-rico-hurricane-outages/>.

²⁰ Press Release. "LUMA Restores Power to 1.46 million customers & begins process of demobilizing emergency posture" LUMA. Oct. 14, 2022. <https://lumapr.com/news/luma-restores-power-to-1-46-million-customers-begins-process-of-demobilizing-emergency-posture/?lang=en>.

²¹ Id.

²² Sullivan, Emily. "Nearly a Year After Maria, Puerto Rico Officials Claim Power Is Totally Restored." NPR.

<https://www.npr.org/2018/08/15/638739819/nearly-a-year-after-maria-puerto-rico-officials-claim-power-totally-restored>.

²³ GAO-21-264. Puerto Rico Recovery. <https://www.gao.gov/assets/gao-21-264.pdf> and "About PREPA – History", PREPA. <https://aeepr.com/en-us/QuienesSomos/Pages/History.aspx>.

²⁴ January 11, 2016 House Committee on Natural Resources Subcommittee on Energy and Mineral Resources Oversight Hearing: "Exploring Energy Challenges and Opportunities Facing Puerto Rico." http://naturalresources.house.gov/uploadedfiles/emr_hearing_memo_1_12_16.pdf.

²⁵ Id.

²⁶ September 26, 2022 House Committee on Natural Resources Full Committee Oversight Hearing: "Puerto Rico's Post-Disaster Reconstruction and Power Grid Development."

²⁷ November 14, 2022 House Committee on Natural Resources Full Committee Oversight Hearing: "Puerto Rico's Post-Disaster Reconstruction & Power Grid Development" https://naturalresources.house.gov/UploadedFiles/FC_Oversight_Hearing_Memo_Hurricane_Recovery_and_Elec_Grid_11.17.22.pdf.

LUMA

In June 2020, LUMA was awarded the contract to operate PREPA's electricity T&D system through a competitive awards process.²⁸ On June 1, 2021, LUMA took control of Puerto Rico's electrical grid.²⁹ LUMA is a joint venture between Houston-based Quanta Energy and Calgary-based ATCO/Canadian Utilities Ltd. Their scope of work is defined by the Puerto Rico Transmission and Distribution System Operation and Maintenance Agreement with PREPA and the government of Puerto Rico's Public-Private Partnership Authority (P3).³⁰

The LUMA energy contract has been a political issue with opposition from many partisan, labor, academic, and non-profit sectors.³¹ Rate increases, significant power outages in frequency and duration, and a perceived lack of customer service have also eroded support for LUMA on the island.³² Recent rate increases can be attributable to the increase in fuel prices, supply chain issues, and the fact that PREPA is unable to negotiate long-term contracts for fuel while they are in bankruptcy proceedings. To that regard, there is little LUMA can influence with respect to rate increases resulting from fuel price increases. Furthermore, the impact of PREPA's debt on its credit rating and revenue generation has severely limited LUMA's capacity to make capital investments.³⁴

Genera

Following a competitive bidding process, Genera PR LLC, a subsidiary of New Fortress Energy,³⁵ entered into a ten-year agreement with the P3 for Genera to be the sole generator of PREPA's thermal generation system beginning July 1, 2023.³⁶ Genera also handles contracts related to fuel purchases for the island's power facilities.³⁷ Electricity rates are determined by a regulatory process run by the Puerto Rico Energy Bureau (PREB).³⁸ While Genera does not control electricity rates, the firm claims to be committed to reducing the cost of electricity generation in Puerto Rico through better maintenance and operation of the existing fleet, investment in new technologies and more efficient systems, and fuel optimization.³⁹

²⁸ Puerto Rico Public-Private Partnership Authority, Press Release, "Government of Puerto Rico Selects LUMA Energy to Operate and Transform Electric Power Transmission and Distribution System" Jun. 22, 2020. <https://www.p3.pr.gov/wp-content/uploads/2020/07/govpr-selects-luma-energy-ope-trans-electric-power-transmi-dist-sis.pdf>.

²⁹ "In Puerto Rico, private company takes over power utility service." *Associated Press* Jun. 2, 2021.

<https://www.nbcnews.com/news/latino/puerto-rico-private-company-takes-power-utility-service-rcna1091>.

³⁰ The Puerto Rico Public-Private Partnership Authority (P3) is a government-owned corporation of Puerto Rico created to regulate public-private partnerships.

³¹ Stephanie Gómez Álvarez, "Lúgaro, Dalmau Would Cancel Contract with LUMA Energy" *The Weekly Journal*. Sept. 17, 2020.

https://www.theweeklyjournal.com/politics/l-garo-dalmau-would-cancel-contract-with-luma-energy/article_3c5ca040-f8ec-11ea-a2da-b7cfab428ed1.html.

³² Nelson Reyes Fariá, "Multiple Sectors Join Protests Against LUMA" *The Weekly Journal*. May 31, 2021.

https://www.theweeklyjournal.com/online_features/multiple-sectors-join-protests-against-luma/article_e67a784e-c223-11eb-9991-2b97ae45d62d.html.

³³ Alejandra O'Connell-Domenech "Why are some Puerto Ricans demanding the island cancel its contract with power company LUMA Energy?" *The Hill*. Sept. 10, 2022. <https://thehill.com/changing-america/sustainability/energy/3636534-why-are-some-puerto-ricans-demanding-the-island-cancel-its-contract-with-power-company-luma-energy/>.

³⁴ Information provided by LUMA upon request by House Committee on Natural Resources GOP Staff.

³⁵ "Genera PR tapped to run Puerto Rico's energy generation" *Puerto Rico Fiscal Agency and Financial Advisory Authority*

<https://aafaf.pr.gov/press-room-articles/genera-pr-tapped-to-run-puerto-ricos-energy-generation/>.

³⁶ "Se materializa la transición a Genera PR como operador de la flota generatriz de la AEE" *El Nuevo Día*. June 30 2023

<https://www.elnuevodia.com/noticias/noticias/notas/se-materializa-la-transicion-a-genera-pr-como-operador-de-la-flota-generatriz-de-la-ae/>.

³⁷ Dánica Coto "Puerto Rico selects company to privatize power generation" *AP News*. Jan 25 2023 <https://apnews.com/article/united-states-government-caribbean-puerto-rico-climate-and-environment-business-12587fe080ed71f545ddd1e520db50e4>.

³⁸ "Operaciones." *Genera PR*. <https://genera-pr.com/operaciones>.

³⁹ "Nosotros." *Genera PR*. <https://genera-pr.com/sobre-nosotros>.

PREPA maintains control over the management and operations of hydropower generation and land-flow gas generation assets.⁴⁰

Regulatory Agencies in Puerto Rico

Within the Government of Puerto Rico, P3 is responsible for regulating public-private partnerships in Puerto Rico and securing private capital for public projects.⁴¹

The Central Office for Recovery, Reconstruction, and Resiliency (COR3) is a Puerto Rico government agency responsible for ensuring that FEMA funds are used for their intended purpose.⁴² In effect, COR3 is the recipient and pass-through entity for the disbursement of FEMA funds for PREPA and projects performed by LUMA and Genera as PREPA's contract partners. COR3 is tasked with assuring the compliance and transparency of disbursed funds.

An independent regulatory agency established under Puerto Rico's local laws, PREB regulates, monitors, and enforces the government of Puerto Rico's energy public policy.⁴³ One of PREB's additional functions is to oversee the island's solar renewable process for permitting approval onto the grid. Any energy plan and policy within Puerto Rico must be reviewed and approved by PREB. PREB also establishes standards for energy power plants and facilities.⁴⁴

A notable use of PREB's authority was the rejection of PREPA's proposal to gasify the electrical grid through a new liquefied natural gas (LNG) terminal and gas-fired generation in its August 2020 Integrated Resource Plan. PREPA had proposed shutting down old fuel plants and replacing them with new natural gas plants, but PREB denied that proposal in favor of renewable energy and solar grid projects.⁴⁵

Federal Agencies

The reconstruction of Puerto Rico's electrical grid is primarily supported, whether directly or indirectly, by federal assistance. According to the Congressional Research Service, the federal government has obligated over \$21 billion in assistance to help restore and rebuild the electrical grid for Puerto Rico post-hurricanes.⁴⁶

Of the \$21 billion, \$9.5 billion is public assistance funds, \$7.8 billion is hazard mitigation from FEMA, over \$1 billion is community development block grants from HUD, and \$1 billion is energy resilience funds from DOE.⁴⁷ The scale of federal assistance in supporting Puerto Rico's electrical grid is unprecedented, even compared to the continental U.S.⁴⁸

⁴⁰ Information provided during a briefing by PREPA for House Committee on Natural Resources GOP staff.

⁴¹ "P3" Puerto Rico Public-Private Partnerships Authority. <https://www.p3.pr.gov/p3>.

⁴² "Fraud, Waste, and Abuse" COR3. <https://recovery.pr.gov/en/fraud-waste-and-abuse>.

⁴³ "About the Puerto Rico Energy Bureau." PREB. <https://energia.pr.gov/en/about-the-commission/#:~:text=Specifically%20the%20PREB%20has%20the,the%20Government%20of%20Puerto%20Rico.&text=To%20achieve%20a%20reliable%20efficient,power%20services%20at%20reasonable%20prices>.

⁴⁴ "About the Puerto Rico Energy Bureau" *Negociado De Energía De Puerto Rico*. <https://energia.pr.gov/en/about-the-commission/>.

⁴⁵ Id.

⁴⁶ Analysis provided by the Congressional Research Service at the request of the U.S. House Committee on Natural Resources Republican staff.

⁴⁷ Id.

⁴⁸ Information provided by COR3 during a briefing for House Committee on Natural Resources GOP staff.

The DOE provides technical assistance to Puerto Rico energy stakeholders through training, tools, and modeling support to enable “planning and operation of the electric system with greater resilience against further disruptions.”⁴⁹ The DOE’s \$1 billion Puerto Rico Energy Resilience Fund has primarily been used to support residential rooftop solar projects and battery storage installations.⁵⁰

Federal assistance supporting the reconstruction of Puerto Rico’s electrical grid is primarily derived from FEMA funding. Within Puerto Rico, two primary types of FEMA funding are used to support the reconstruction of its electrical grid: Public Assistance (PA) and Hazard Mitigation Assistance (HMA).⁵¹ FEMA has obligated approximately \$9.5 billion in PA funding for Puerto Rico’s electrical grid reconstruction.⁵²

FEMA’s PA grant review and awarding process within Puerto Rico is unique to the island as this complex process is different from FEMA processes in other states and territories.⁵³ According to COR3, Puerto Rico has a unique process due to the unprecedented challenge of rebuilding Puerto Rico’s electrical grid. The FEMA PA grant review process can take fifteen to fifty days which creates an additional process challenge.⁵⁴

FEMA’s HMA grants provide funding for eligible mitigation measures that reduce disaster losses. These funds are meant to reduce long-term risk from future disasters, and thus, PA funds are the primary funding mechanism for immediate recovery. Puerto Rico has received approximately \$7.8 billion in HMA funds, also managed by COR3.⁵⁵

While tens of billions of dollars in FEMA funds for Puerto Rico have been obligated, most of these funds have yet to be disbursed.⁵⁶ The Government Accountability Office found that FEMA has obligated approximately \$23.4 billion in PA for Puerto Rico’s reconstruction, which includes other sectors beyond energy.⁵⁷ Of this amount, only \$1.8 billion has been expended. Projects have either been delayed or not yet started. This has led to increasing questions about why these funds have yet to be used and what must be done to expedite the grant process.

While FEMA funding represents the majority of federal assistance to Puerto Rico, HUD provides approximately \$1.93 billion in funds for improving the island’s electrical grid including climate resilience and green energy initiatives in Puerto Rico.⁵⁸

June 2024 Outages

From June 2 to June 9, 2024, blackouts occurred in the Puerto Rico municipalities of Santa

⁴⁹ “Puerto Rico Grid Recovery and Modernization.” U.S. Department of Energy. <https://www.energy.gov/gdo/puerto-rico-grid-recovery-and-modernization>.

⁵⁰ “Puerto Rico Energy Resilience Fund.” U.S. Department of Energy. <https://www.energy.gov/gdo/puerto-rico-energy-resilience-fund>.

⁵¹ Information provided by COR3 during a briefing for House Committee on Natural Resources GOP staff.

⁵² Id.

⁵³ Id.

⁵⁴ Information provided by FEMA during a briefing for House Committee on Natural Resources GOP staff.

⁵⁵ “Hazard Mitigation Assistance.” COR3. <https://recovery.pr.gov/en/recovery-programs/hazard-mitigation-assistance>.

⁵⁶ Government Accountability Office, “Puerto Rico Disasters: Progress Made, but the Recovery Continues to Face Challenges.” Feb 13, 2024. <https://www.gao.gov/products/gao-24-105557>.

⁵⁷ Id.

⁵⁸ “HUD Officials Highlight Climate Resilience Funding Opportunities in Puerto Rico and US Virgin Islands.” HUD. April 19, 2024. https://www.hud.gov/press/press_releases_media_advisories/hud_no_24_083.

Isabel, Aibonito, and Coamo⁵⁹ due to a broken electrical transformer at the Santa Isabel substation.⁶⁰ LUMA increased the capacity of the transmission line and installed temporary generators to restore service to the substation.⁶¹ LUMA is replacing the broken Santa Isabel transformer with a mega transformer⁶² which is currently being installed,⁶³ as well as rebuilding affected lines to remedy this issue.⁶⁴

On the eve of Wednesday, June 12, 2024, a widespread power outage hit Puerto Rico, leaving 350,000⁶⁵ customers without electricity after two power plants shut down.⁶⁶ LUMA's chief executive officer stated that overgrown vegetation caused the outages and that LUMA has launched an initiative to clear vegetation across 16,000 miles of powerlines.⁶⁷ While power was restored the following day, this series of blackouts sparked uproar and frustrations among Puerto Rico's residents over managing the island's electrical grid. The governor of Puerto Rico, Pedro Pierluisi, ordered an investigation into the June 12 blackout and stated that "if negligence is found," then LUMA will not be reimbursed with public funds for repairs or restoration of service.⁶⁸

Further adding to public frustrations, LUMA announced that a transformer the company transported to the Santa Isabel substation had internal problems and was not operational.⁶⁹ The transportation of these transformers costs \$4 million.⁷⁰ LUMA has since announced that it is moving a replacement transformer from the Maunabo substation. Still, it appears the mayor of Maunabo has blocked access to the facility over fears of potential blackouts from no longer having a backup transformer.⁷¹

Tropical Storm Ernesto and August 2024 Load Sheds

On August 13 and 14, 2024, Tropical Storm Ernesto passed just above the northern tip of Puerto Rico, bringing tropical storm-force winds, heavy flooding, and landslides⁷² to the island.⁷³ On

⁵⁹ Manuel Guillama Capella, "LUMA accepts that the transformer that caused the breakdown in Santa Isabel had doubled its utility", *El Nuevo Día* June 7 2024, <https://www.elnuevodia.com/english/news/story/luma-accepts-that-the-transformer-that-caused-the-breakdown-in-santa-isabel-had-doubled-its-utility>.

⁶⁰ LUMA Progress Update June 2024 provided to U.S. House Committee on Natural Resources Republican staff.

⁶¹ Id.

⁶² Adriana Díaz Tirado, "The transfer of the mega transformer to Santa Isabel is completed", *El Nuevo Día* June 22 2024, <https://www.elnuevodia.com/english/news/story/the-transfer-of-the-megatransformer-to-santa-isabel-is-completed/>.

⁶³ "LUMA Initiates Second Phase of Transformer Transfer to Santa Isabel", *LUMA* June 20 2024, <https://lumapr.com/news/luma-initiates-second-phase-of-transformer-transfer-to-santa-isabel/?lang=en>.

⁶⁴ Id.

⁶⁵ John Yoon, "Outage Leaves About 350,000 Customers in Puerto Rico Without Power.", *New York Times* June 13 2024, <https://www.nytimes.com/2024/06/13/us/puerto-rico-outage.html?searchResultPosition=1>.

⁶⁶ "Widespread outage hits Puerto Rico as customers demand ouster of private electric company" *AP News* June 12 2024, <https://apnews.com/article/puerto-rico-power-outage-luma-0253fa691daa472b41ec44b28ecfda91>.

⁶⁷ Id.

⁶⁸ Gloria Ruíz Kuilan, "Pedro Pierluisi ordena investigar el apagón del miércoles y activa la Guardia Nacional: 'Esto no se debe repetir'" *El Nuevo Día* June 13 2024 <https://www.elnuevodia.com/noticias/gobierno/notas/pedro-pierluisi-ordena-investigar-el-apagon-del-miercoles-y-activa-la-guardia-nacional-esto-no-se-debe-repetir/>.

⁶⁹ Manuel Guillama Capella, "The transformer that LUMA transported to Santa Isabel substation at a cost of \$4 million is out of order." *El Nuevo Día*. July 11, 2024. <https://www.elnuevodia.com/english/news/story/the-transformer-that-luma-transported-to-santa-isabel-substation-at-a-cost-of-4-million-is-out-of-order/>.

⁷⁰ Id.

⁷¹ "LUMA insists transformer removal will not impact Maunabo" *The San Juan Daily Star*. <https://www.sanjuandaily.com/post/luma-insists-transformer-removal-will-not-impact-maunabo>.

⁷² Jan Wesner Childs, "Ernesto Slams Puerto Rico: Half Of The Island Loses Power". *The Weather Chanel*. Aug. 15, 2024. <https://weather.com/storms/hurricane/news/2024-08-13-ernesto-puerto-rico-tropical-storm>.

⁷³ U.S. Department of Energy Situation Report #8 | Tropical Storm Ernesto. Aug. 20, 2024 (p. 1).

August 14, torrential downpours of up to 10 inches of rain from Ernesto blanketed parts of Puerto Rico.⁷⁴ Approximately 750,000 LUMA customers lost service during the peak of the outage.⁷⁵

On August 23, LUMA stated they restored power to 729,000 customers who lost service due to Ernesto.⁷⁶ While it is positive to see that power has largely been restored, the storm has once again raised concerns over the fragility of the electrical grid. There are speculations that the grid could have collapsed completely if the storm had strengthened into a hurricane.

Policy Considerations

As policymakers assess Puerto Rico's electrical grid and seek solutions to improve the island's access to reliable energy, several factors must be considered.

Recovery from PREPA's Mismanagement of the Electrical Grid

When LUMA and Genera took over managing T&D and power generation from PREPA, they took on a highly fragile and mismanaged system. Decades of neglect and lack of investment have resulted in the island's outdated and failing transmission and generation fleet.⁷⁷ Much of PREPA's assets acquired by LUMA and Genera were either non-operational or required significant repair. Since beginning operations, LUMA and Genera have worked to bring the power fleet up to industry standards.⁷⁸ As most of the equipment and generators are decades beyond their recommended service life, this will require a significant amount of time and investment.⁷⁹

Impact of Renewable Prioritization on Supply Chain and Capacity

Further exacerbating the challenge, the push for the Biden-Harris administration's purchase and use of electric vehicles (EVs) has severely impacted the supply chain for transformers. The increasing demand for EVs has led to a surge in electrification in the U.S. This increased demand has placed further strain on the supply of transformers, which is already taxed from ongoing efforts to replace outdated transformers across the country.⁸⁰ Moreover, the batteries and chargers used for EVs require materials and precious metals similar to those used in power plants. This double effect by prioritizing EVs has led to significantly longer lead times for LUMA to receive new transformers, often taking 1-3 years for an order to be fulfilled and transported.⁸¹

The use of EVs in Puerto Rico has also affected the island's electrical generation capacity.

⁷⁴ Id.

⁷⁵ NOAA, "Ernesto Brings Dangerous Seas to North America's Atlantic Coast." <https://www.nesdis.noaa.gov/news/ernesto-brings-dangerous-seas-north-americas-atlantic-coast>.

⁷⁶ LUMA – Tropical Storm Ernesto Update #10. Aug 23. 2024.

⁷⁷ Gianpaolo Pietri, "Neglect, Corruption Left Puerto Rico's Power Grid Ripe for Failure, Observers Say". *Voice of America News*. Nov. 30, 2017. <https://www.voanews.com/a/experts-say-neglect-corruption-left-puerto-rico-power-grid-ripe-for-failure/4144129.html>.

⁷⁸ Information provided by Genera PR to the U.S. House Committee on Natural Resources Republican staff in July 2024.

⁷⁹ Id.

⁸⁰ "The U.S. is facing an "unprecedented" shortage of electric transformers, NREL says" EUCI. March 27, 2024. <https://www.euci.com/the-u-s-is-facing-an-unprecedented-shortage-of-electric-transformers-nrel-says/>.

⁸¹ Information provided by LUMA during a briefing for House Committee on Natural Resources GOP staff.

According to Genera representatives, the increase in the number of EVs on the island has led to an increase in electrical usage used for recharging vehicles.⁸² EV recharging often takes place when electricity is already in peak demand, as residents are at home in the evening. Solar power is insufficient to mitigate this issue as it takes place during sunset, and most residents do not have batteries for reserving solar power. As such, this has forced Genera to seek ways to increase power generation capacity.

Federal regulations against non-renewable sources have further jeopardized attempts to revitalize Puerto Rico's electrical grid. In addition to severely slowing the PA grant process, Puerto Rico nearly lost access to two critical temporary LNG-based generators installed in San Juan and Palo Seco power plants due to emissions concerns. These generators were initially operated by FEMA and were scheduled to end operations by March 15, 2024.⁸³ Following outcry over the negative impact of removing the generators before hurricane season and the installation of permanent generators, FEMA agreed to hand over operational control of these generators to the government of Puerto Rico.⁸⁴ However, the Puerto Rico government had to receive a permit from the U.S. Environmental Protection Agency (EPA) to allow Genera to operate the generators.⁸⁵ The permit application was at risk of being rejected over EPA's concerns about the impact of the generators on greenhouse gas emissions, but the EPA agreed to conditionally approve the permits based on terms to be set between the agency and Genera.⁸⁶

The practical reality is that the Biden-Harris administration's prioritization of solar projects is neither feasible nor sustainable, as approximately 43 percent of Puerto Rico's residents live in poverty.⁸⁷ The upfront cost of solar panel installation is \$28,500 in cash.⁸⁸ For context, the median household income in Puerto Rico in 2023 was \$24,002.⁸⁹ In addition to their high costs, solar panels are highly ineffective against severe weather, as storms can damage and strip away residential and in some cases, large-scale solar panels.⁹⁰

The Biden-Harris administration has ignored this reality as it continues to champion rooftop solar projects as its solution for stabilizing power on the island. Following the mid-June 2024 outages, the DOE announced in early July 2024 a project to install 3,000 residential solar panels and storage by the end of the year.⁹¹ This announcement disregards the fact that more than 300,000 residents were affected by the mid-June outages and over 1.5 million electricity consumers in Puerto Rico.

⁸² Information provided by Genera PR during a briefing for House Committee on Natural Resources GOP staff.

⁸³ Bernal, Rafael, "Puerto Rico raises alarms as FEMA ends power generation mission." November 17, 2023.

⁸⁴ Id.

⁸⁵ Bernal, Rafael, "Puerto Rico waits anxiously for EPA power plant approval." March 6, 2024. <https://thehill.com/latino/4513548-puerto-rico-epa-power-plant-approval-fema/>.

⁸⁶ Information provided to House Committee on Natural Resources Republican staff by Genera.

⁸⁷ "Pervasive Poverty in Puerto Rico: a Closer Look." CENTRO PR. September 22, 2023. <https://centropr.hunter.cuny.edu/reports/pervasive-poverty-in-puerto-rico/>.

⁸⁸ Tom Sanzillo & Cathy Kunkel, *Solar at a Crossroads in Puerto Rico*, Institute for Energy Economics and Financial Analysis, p. 10.

⁸⁹ "QuickFacts Puerto Rico" *United States Census Bureau* July 1, 2023. <https://www.census.gov/quickfacts/fact/table/PR/PST045223>.

⁹⁰ April 11, 2024 House Committee on Natural Resources Subcommittee on Indian and Insular Affairs Oversight Hearing: "Promoting Affordable and Reliable Energy Sources for the U.S. Insular Areas | Indian and Insular Affairs Subcommittee." <https://naturalresources.house.gov/calendar/eventsingle.aspx?EventID=415818>.

⁹¹ Walton, Robert. "DOE to deploy over 3,000 solar + storage home systems in 2024 for most vulnerable Puerto Ricans." July 16, 2024. <https://www.utilitydive.com/news/doe-solar-storage-home-systems-puerto-rico/721429/>.

The Responsibilities of LUMA and Genera

While LUMA and Genera face a monumental task in attempting to restructure Puerto Rico's fragile electrical grid, these firms also have the responsibility of ensuring transparency in their processes. Privatizing PREPA was a step in the right direction, but LUMA and Genera must work carefully to earn the public's trust and clearly explain the challenges they face and their plans to rebuild the grid.

There have been concerns regarding LUMA's lack of transparency and bureaucratic processes regarding customer engagement.⁹² With a lack of or insufficient explanations as to why outages occur and multiple-stage processes for requesting service repair, customers have expressed frustrations over LUMA's management. Greater transparency and communication would allow customers to better understand why outages happen, the challenges to energy stabilization, and how LUMA is addressing these challenges. While Genera has received less criticism than LUMA over the recent blackouts, perhaps due to the infancy of its contract, the firm still bears the responsibility of improving transparency and keeping its customers informed on the status of operations and the impact of future projects. A long-term challenge for LUMA and Genera will be to decrease their reliance on federal funds.

Potential Solutions

The negative impact of the blackouts on Puerto Rico's residents' livelihoods and the island's economy cannot be overstated. Small business owners constantly deal with electricity losses that impede revenue and productivity.⁹³ When blackouts occur, consumers incur damages to their appliances, and the spoiling of their foods and medicines adds additional costs.⁹⁴ The most recent blackout cost Puerto Rico's economy approximately \$1.8 million per hour, not accounting for damaged equipment costs.⁹⁵

Policy solutions will need to consider the immediate and long-term needs of Puerto Rico. In the short term, Puerto Rico needs practical solutions that will provide reliable energy without the need to overhaul its infrastructure. In the long term, Puerto Rico will need cost-effective energy options that increase the electrical grid's resilience to natural disasters.

House Republicans continue to support an all-of-the-above energy approach that allows for diversification of Puerto Rico's energy sources and increases access to secure, reliable and affordable energy.

⁹² Information during a meeting between House Committee on Natural Resources GOP staff and Puerto Rican companies and organizations affected by the recurring outages in Puerto Rico.

⁹³ Marian Diaz, "Merchants on Ponce de León Avenue have been without electricity for more than a week", *El Nuevo Día* June 5 2024 <https://www.elnuevodia.com/english/business/notas/merchants-on-ponce-de-leon-avenue-have-been-without-electricity-for-more-than-a-week/>.

⁹⁴ Nicole Acevedo, "Puerto Ricans struggle to grasp economic impact of recurrent power outages" *NBC News* June 14 2024 <https://www.aol.com/puerto-ricans-struggle-grasp-economic-161535619.html?guccounter=1>.

⁹⁵ Maricarmen Rivera Sánchez et al. "‘‘Esto ha sido una historia de terror’’: pequeños comercios temen irse a pique por la falta de electricidad" *El Nuevo Día* June 13 2024 <https://www.elnuevodia.com/negocios/economia/notas/esto-ha-sido-una-historia-de-terror-pequenos-comercios-temen-irse-a-pique-por-la-falta-de-electricidad/>.