

**GOVERNMENT OF PUERTO RICO
PUERTO RICO PUBLIC SERVICE REGULATORY BOARD
PUERTO RICO ENERGY BUREAU**

NEPR

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IN RE:
INTERCONNECTION REGULATIONS

CASE NO.: NEPR-MI-2019-0009
CEPR-MI-2018-0008

SUBJECT: LUMA's Comments Following the Virtual Stakeholder Workshop held May 28, 2026

**MOTION TO SUBMIT LUMA'S COMMENTS FOLLOWING THE VIRTUAL
STAKEHOLDER WORKSHOP HELD ON MAY 28, 2026**

TO THE PUERTO RICO ENERGY BUREAU:

COME NOW, LUMA ENERGY, LLC as Management Co., and **LUMA ENERGY SERVCO, LLC** (collectively, LUMA), through the undersigned legal counsel and respectfully state and request the following:

I. Relevant Procedural History

1. On March 19, 2026, the Puerto Rico Energy Bureau of the Public Service Regulatory Board ("Energy Bureau") issued a Resolution and Order ("March 19th Resolution") "resum[ing] the administrative processes in this case for the purpose of completing and adopting interconnection rules in line with current energy public policy" in light of House of Representatives' Joint Resolution 193 signed by the Governor on January 7, 2026. The Energy Bureau indicated it would conduct workshops to consider new inputs and feedback from stakeholders before issuing a draft interconnection regulation by July 7, 2026.¹ The Energy Bureau also invited all stakeholders and interested persons to provide, on or before April 15, 2026, their

¹ See March 19th Resolution, p. 2.

comments and feedback on a list of key issues that remained unresolved from previous proceedings related to the proposed interconnection regulation in this docket.²

2. On April 15, 2026, LUMA submitted its comments on the list of key issues.³

3. On April 27, 2026, the Energy Bureau issued a Resolution and Order (“April 27th Resolution”) scheduling a Virtual Stakeholder Workshop for May 28, 2026, at 9:30 a.m., with the objective of evaluating and addressing stakeholders’ comments and recommendations on the interconnection regulation.⁴ The Energy Bureau ordered LUMA to attend this workshop and to provide a presentation addressing the subjects specified by the Energy Bureau, while inviting other stakeholders to also present.⁵ The Energy Bureau also ordered LUMA to provide comments, on or before May 28, 2026, in response to the comments submitted by the Solar and Energy Storage Association of Puerto Rico (“SESA”) on April 15, 2026⁶ and indicate, where LUMA disagrees with SESA, a proposed alternative approach.⁷ The Energy Bureau highlighted the subjects of meter socket adapters, daytime minimum load, compensation for customer curtailment and grid operator costs for network studies and proposed fixed fee and standardized kW fee depending on system size.⁸ The Energy Bureau also invited other stakeholders to submit comments by such date.⁹

² *See id.*

³ *See Motion to Submit LUMA’s Comments on Key Issues Relating to Preliminary Draft of Interconnection Regulation.*

⁴ April 27th Order, p. 2.

⁵ *See id.*

⁶ *See SESA’s Comments on Interconnection Regulation Core Components, Concepts, and Key Questions*, Case No. NEPR-MI-2019-0009.

⁷ *See April 27th Motion.*, p. 3.

⁸ *See id.*

⁹ *Id.*

4. On May 27, 2026, LUMA filed with the Energy Bureau its presentation for the Virtual Stakeholder Workshop to be held on May 28, 2026.

5. On May 28, 2026, the Energy Bureau held the Virtual Stakeholder Workshop. During this workshop, the participants discussed issues relating to the Technical Interconnection Requirements, Smart Inverter Settings, curtailment compensation, proactive hosting capacity planning, daytime minimum load, allocation of grid study costs, queue transparency, meter socket adapters, and the workflows for processing interconnection applications, among others. Regarding the latter, LUMA was asked to provide information on how it proposes that the workflows for processing of interconnection applications should be modified for purposes of the new interconnection regulation. LUMA requested fifteen (15) business days to submit this information as well as comments addressing other issues raised by stakeholders, and the workshop moderator agreed to allow LUMA ten (10) business days to submit its comments.

II. LUMA's Comments

6. In accordance with the above, LUMA submits herein its comments on various subjects discussed during the Virtual Stakeholder Workshop, including those mentioned in the April 27th Resolution, those mentioned in this motion, and the workflows for the processing of interconnection applications. *See Exhibit 1.*

WHEREFORE, LUMA respectfully requests this honorable Energy Bureau to **take notice** of the above, **accept** LUMA's comments included in *Exhibit 1*, and **consider** them in the preparation of the proposed interconnection regulation.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 11th day of June 2026.

We hereby certify that we filed this Motion on this date using the electronic filing system of this Puerto Rico Energy Bureau and that copy of this Motion will be notified to: mvalle@gmlex.net; alexis.rivera@prepa.pr.gov; rcruzfranqui@gmlex.net; nzayas@gmlex.net; agustin.irizarry@upr.edu; javrua@sesapr.org; hriviera@jrsp.pr.gov; contratistas@jrsp.pr.gov; aconer.pr@gmail.com; John.jordan@nationalpfg.com; pjcleanenergy@gmail.com; cfl@mcvpr.com; mqs@mcvpr.com; gcordero@crmjv.com; Steven.rymsha@sunrun.com; azayas@azeng.net; jberdner@enphaseenergy.com; rbelur@enphaseenergy.com; mrosenfeldt@enphaseenergy.com; gferrer@enphaseenergy.com; kkoch@tesla.com; Andrew.Cote@generac.com; moody@cleanpower.com; axelvargas.montanez@gmail.com.



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EXHIBIT 1

LUMA's Comments

LUMA's Comments Following Interconnection Regulation Stakeholder Workshop of May 28, 2026

NEPR-MI-2019-0009

June 11, 2026



Comments Following Interconnection Regulation Stakeholder Workshop of May 28, 2026

Executive Summary

LUMA's submits the following additional comments to address issues raised during the May 28th Stakeholder Workshop, including to address the workflow processes that should be adopted for the new interconnection regulation.

During the May 28th Stakeholder Workshop, LUMA provided a presentation on the subjects required by the Energy Bureau. In addition, two other stakeholders gave presentations. The participants discussed issues relating to the Technical Interconnection Requirements, Smart Inverter Settings, curtailment compensation, proactive hosting capacity planning, daytime minimum load, allocation of grid study costs, queue transparency, meter socket adapters, and workflows for processing interconnection applications, among others.

LUMA's comments acknowledge the goals underlying stakeholder recommendations but highlight practical considerations that should guide the regulation's design. This includes ensuring that data, system visibility, and operational tools continue to mature; that customer facing solutions such as meter socket adapters, comply with safety and reliability requirements; and that screening methods and cost structures remain fair, transparent, and aligned with system needs. LUMA also underscores that technical standards, such as Smart Inverter Settings, are essential for maintaining system reliability as distributed generation expands, and notes that these tools significantly reduce operational challenges when broadly implemented.

Overall, LUMA supports a balanced regulatory framework that promotes continued DER growth while ensuring reliability, fairness, and operational feasibility. LUMA encourages a structure that provides regulatory certainty, enhances transparency, and enables proactive planning, all while preserving sufficient flexibility for the utility to adapt to technical requirements as Puerto Rico's electric system continues to evolve.

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List of Acronyms

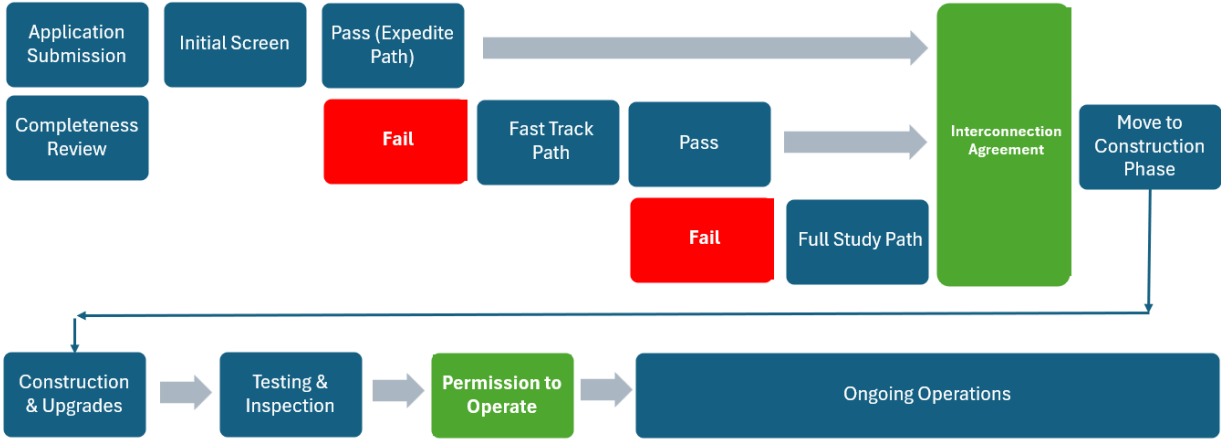
ACRONYM	DEFINITION
AMI	Advance Metering Infrastructure
CER	Customer Energy Resource
CHP	Combined Heat and Power
COIF	Company Owned Interconnection Facilities
CPUC	California Public Utilities Commission
DBESS	Distributed Battery Energy Storage System
DER	Distributed Energy Resources
DML	Daytime Minimum Load
DOE	Department of Energy
DPV	Distributed Solar
FERC	Federal Energy Regulatory Commission
GIS	Geographic Information Systems
HCA	Hosting Capacity Analysis
HECO	Hawaiian Electric Company
IEEE	Institute of Electrical and Electronics Engineers
JR	Joint Resolution
kW	Kilowatts
MSA	Meter Socket Adapters
MW	Megawatt
NREL	National Renewable Energy Laboratory
OEM	Original Equipment Manufacturer
OMA	Operating and Maintenance Agreement
PPOA	Power Purchase and Operating Agreement
PTO	Permission to Operate
PREB	Puerto Rico Energy Bureau
PV	Photovoltaic

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ACRONYM	DEFINITION
QEL	Quality of Electrical Load
SCADA	Supervisory Control and Data Acquisition
SCED	Security-Constrained Economic Dispatch
SESA	Solar and Energy Storage Association
SGIP	Small Generator Interconnection Procedures
SIS	System Impact Study
TIR	Technical Interconnection Requirements
T&D	Transmission and Distribution

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1.0 Proposed Workflows



STEP 1: APPLICATION SUBMISSION

To formally initiate the interconnection process, the customer needs to submit the application to LUMA. The application must include the technical specifications, site information, and any required fees. A confirmation receipt will be provided by LUMA and based on the completed application date the submission will be assigned to a queue. LUMA will conduct an initial completeness review within a predetermined timeframe. During this review, LUMA verifies that all required information is present and that the application meets the defined criteria for processing. If items are missing, the customer is notified and must supply the missing information before the application can proceed.

To ensure fairness and transparency, the process should include a clear definition of what constitutes a complete application. Both LUMA and the customer should be bound by specific response deadlines to prevent delays. Applicants should also have visibility into their queue status so they can understand where their project stands and plan accordingly.

STEP 2: INITIAL SCREEN

Once the application is deemed complete, LUMA will evaluate the project using a standardized set of technical screens. These screens assess factors such as system size, circuit loading, voltage impacts, and protection coordination to determine whether the proposed DER can be safely and reliably integrated into the grid. The goal is to identify any conditions that may require additional analysis or mitigation before approval.

LUMA will determine the appropriate evaluation path based on screening results. Projects that pass all criteria may qualify for a fast-track approval process and move forward without additional studies to an Interconnection Agreement. However, supplemental assessments may be conducted to address potential minor modifications. These modifications are not anticipated to materially affect project timelines or impede overall project progression.

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If one or more screens are triggered, the project proceeds to a full study review for more detailed analysis. In cases where the impacts are more complex or clearly exceed preset thresholds, the project advances directly to a full interconnection study.

Best practices call for uniform application of the technical screens across all projects. Pass/fail criteria should be transparent and publicly available; applicants should understand how decisions are made. Low-impact projects should benefit from fast-track processing, enabling efficient interconnection for systems that pose minimal grid risk.

Fast Track path (if applicable)

If a project does not pass one or more of the initial technical screens, it may enter the Fast Track path stage. The purpose is to determine whether the system can be interconnected safely without requiring a full engineering study. Fast Track path focuses specifically on the issues identified during screening and provides a faster, more targeted evaluation pathway for low to moderate impact projects.

During the Fast Track path, LUMA performs a focused engineering analysis tailored to the screens that were not satisfied. This may include examining localized voltage impacts, assessing protection concerns, or evaluating circuit loading under specific operating conditions. LUMA will also consider whether simpler mitigations, such as upgrading a meter, adding a protection device, or applying operating limits, can adequately resolve concerns without escalating the project to full study. Once the review is complete, the applicant receives results, associated costs, and recommended next steps.

For an efficient and predictable process, best practices call for a clearly defined scope and established timelines for completing the supplemental review. Applicants should receive cost estimates before any engineering work begins, so they can make informed decisions about whether to proceed or not. It is also important to maintain a clear distinction between supplemental review and full interconnection studies, ensuring that only projects requiring extensive analysis move to the more time and cost intensive study phase.

Full Study Path (if required)

A Full Study path will be required when a project cannot be approved through initial screening or Fast Track path. The purpose of this stage is to thoroughly evaluate the project's potential impacts on safety, reliability, and overall system operations. These assessments ensure that the proposed DER can be integrated without creating unacceptable risks or requiring impractical system changes.

During this phase, LUMA conducts one or more detailed studies, typically feasibility study, system impact study, and facilities study, depending on project size and complexity. These analyses examine thermal loading, voltage regulation, protection coordination, fault current levels, and any operational interactions that may result from the project. Based on these findings, the utility identifies the network upgrades required, including their estimated costs and expected construction timelines. Study results are shared with the applicant so they can make informed decisions about proceeding.

Best practices call for the use of standardized methodologies for all interconnection studies. Clear communication milestones should be established so applicants receive updates at each stage of the process. Finally, cost responsibility should follow widely accepted causation principles, ensuring that applicants pay only for upgrades needed by their project while broader system improvements are assigned appropriately.

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STEP 3: PERMISSION TO OPERATE

LUMA will prepare a Permission to Operate (PTO) for the applicant once the required system studies are completed and the necessary network upgrades are identified. The purpose of this is to formally establish the technical, operational, and financial terms under which the project is interconnected with the grid. It reflects the results of all prior analyses and protects both parties by developing a clear understanding of their responsibilities before construction begins.

The PTO will contain the required network upgrades, operating requirements, and associated cost obligations. The applicant is then responsible for reviewing, signing, and returning the PTO within a defined timeframe to keep the project active. After the applicant signs, LUMA countersigns the document and confirms that the project may proceed with the construction and installation phase, subject to payment and any other preconstruction conditions.

Best practices for this stage include the use of standardized templates with limited project-specific modifications, bringing fairness and consistency. Clear execution deadlines should be defined, along with consequences for customer and utility inactivity, to prevent unnecessary queue delays. A well-defined dispute resolution process should also be included to provide a structured path for resolving disagreements.

STEP 4: CONSTRUCTION AND NETWORK UPGRADE IMPLEMENTATION

The applicant is responsible for building the generation facility in accordance with all approved designs, technical requirements, and safety standards. LUMA will complete network upgrades identified during the interconnection studies. Both parties coordinate their construction schedules, share progress updates, and address any field issues that arise to ensure that all work stays aligned and compliant.

Effective project delivery relies on coordinated project management, including milestone tracking and timely communication between the customer and LUMA. Clear inspection expectations and documentation requirements should be established, with safety and regulatory compliance monitored continuously throughout construction.

STEP 5: TESTING, INSPECTION, AND PERMISSION TO OPERATE

Project enters the testing and verification stage once the construction phase is complete. The applicant performs all commissioning tests required for the technology and interconnection type, documenting the results and submitting them to the utility for review. LUMA may conduct its own inspections or witness testing to verify correct installation, equipment performance, and compliance with applicable standards and interconnection requirements.

When all testing, inspections, and documentation are complete and any identified issues are resolved LUMA issues written PTO. This authorization allows the facility to energize and begin injecting or operating parallel to the grid. Best practices include standardized commissioning procedures, defined timelines for utility inspections, and clear criteria for granting PTO across all project classes.

STEP 6: ONGOING OPERATIONS AND COMPLIANCE

Applicants must operate the facility according to the interconnection agreement, technical standards, and applicable operating requirements. LUMA continues to monitor system performance and may request periodic testing, data updates, or maintenance records to ensure continued safe and reliable

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interconnection. If the applicant seeks to modify equipment, change ownership, or alter operating characteristics, these changes must be processed through established modification procedures.

Strong long-term performance depends on well-defined maintenance obligations, clear processes for evaluating material modifications, and ongoing communication channels between the customer and LUMA to support safe operations and coordinated system management.

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2.0 Regulatory Framework

POSITION

LUMA suggests that a unified interconnection regulatory framework be built upon Regulations 8915, 8916 and 9028 and recognized utility practices, such as those in the US Federal Energy Regulatory Commission (FERC)'s Standard Interconnection Agreements and Procedures for Small Generators (SGIP)¹ and the US Department of Energy's DER Interconnection Roadmap².

DISCUSSION AND RATIONALE

Using this framework aligns with the Statement of Motives in Puerto Rico's Act No. 17-1019, which reiterates that Act No. 120-2018 set forth the process to transform the electric system into one that is modern, sustainable, reliable, efficient, cost effective, and resilient to the impacts of extreme weather.

The new Interconnection Regulation should clearly establish that all DERs including, but not limited to, Distributed Solar (DPV), Distributed Battery Energy Storage System (DBESS), Combined Heat and Power (CHP) facilities, Community Solar and Microgrids, fall within its scope. Regulatory language should remain technology agnostic to ensure flexibility as new and future technologies emerge, while maintaining continuity with existing processes and technical criteria. Within this unified framework, DER technologies should have clearly defined tier-levels and requirements, including those submitted by LUMA in the Technical Interconnection Requirements (TIR) initially filed in 2021³, with modifications subsequently submitted in May 2022⁴ and November 2022⁵. Citing multiple utility experiences, DOE built its DER Interconnection Roadmap around a tiered interconnection processes for DERs of different sizes⁶. The Interconnection Regulation should also incorporate limits related to export capacity, voltage impacts, and hosting capacity considerations to support safe and reliable operation of the electricity grid and its customers.

LUMA notes that existing customer programs Net Energy Metering (NEM) was designed for customer self-consumption, and systems disproportionately oversized to export energy function more like commercial generators, not traditional NEM participants. Use of the program in such a manner, increases the impacts of DERs on the system.

Additionally, all DERs should be subject to structured provisions governing their technical operation and interactions with the utility, including cost responsibilities, compliance with technical requirements, and conditions for the use of utility infrastructure. Establishing clear, consistent, and transparent requirements

¹ Standard Interconnection Agreements and Procedures for Small Generators: <https://www.ferc.gov/electric-transmission/generator-interconnection/standard-interconnection-agreements-and-procedures>

² US Department of Energy's DER Interconnection Roadmap: <https://www.energy.gov/sites/default/files/2025-01/i2X%20DER%20Interconnection%20Roadmap.pdf>

³ November 15, 2021. Submittal of Additional Comments to Preliminary Draft of Proposed Generating Facility and Microgrid Interconnection Regulation: <https://energia.pr.gov/wp-content/uploads/sites/7/2021/11/Motion-to-Submit-Additional-Comments-to-Preliminary-Draft-of-Interconnection-Regulation-NEPR-MI-2019-0009.pdf>

⁴ May 19, 2022. Submittal of Complete Version of Technical Interconnection Requirements Document: <https://energia.pr.gov/wp-content/uploads/sites/7/2022/05/Motion-Submitting-Complete-Version-of-Technical-Interconnection-Requirements-Documents-NEPR-MI-2019-0009.pdf>

⁵ November 1, 2022. Submittal of Additional Comments: <https://energia.pr.gov/wp-content/uploads/sites/7/2022/11/Motion-to-Submit-Additional-Comments-NEPR-MI-2019-0009.pdf>

⁶ US Department of Energy's DER Interconnection Roadmap: <https://www.energy.gov/sites/default/files/2025-01/i2X%20DER%20Interconnection%20Roadmap.pdf>

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promotes predictable operational expectations, improve system planning, and supports the continued safe integration of DERs, in line with public policy.

3.0 Governance of Technical Interconnection Requirements

POSITION

LUMA maintains that as the entity contractually responsible for the safe, reliable, and efficient operation of the transmission and distribution system, it must retain the authority to make timely, data-driven updates to the TIR based on rapidly evolving system conditions, operational experience, and real-time performance. TIRs include values for standards.

DISCUSSION AND RATIONALE

The Energy Bureau recognized this distinction in its September 9, 2022 Resolution and Order⁷ separating technical requirements from the Interconnection Regulation and directing that the TIR be maintained as an independent, update-capable document. This approach aligns with Department of Energy's (DOE) Roadmap⁸ and best utility practice, where operators maintain the flexibility to adjust technical specifications in response to system conditions without undergoing protracted regulatory review.

LUMA will continue to provide justification, documentation, and timely notice for any TIR revisions, but final decision-making authority over technical specifications must reside with the system operator to ensure that critical updates can be implemented promptly, safeguarding system stability and protecting all customers.

This need is further discussed throughout LUMA's June 20, 2025, filing on revised Smart Inverter Settings⁹, which highlights how evolving system conditions, operational experience, and real-time performance data inform the adjustments required to maintain grid safety and reliability. Under the Transmission and Distribution Operating and Maintenance Agreement (T&D OMA), LUMA is expressly obligated to apply Prudent Utility Practice and uphold all operational standards necessary to protect the grid, which includes updating technical criteria, such as voltage-control settings, frequency ride-through parameters, and protection requirements, when system behavior indicates a reliability risk or when new technologies become available.

While transparency, notice, and stakeholder communication remain essential, the procedural framework must distinguish between policy-based regulatory decisions, which appropriately fall under the Energy Bureau's authority; and technical operating standards, which must remain within the utility's domain. without introducing informal or prolonged review cycles that could delay interconnection activities or hinder LUMA's ability to protect the electric system.

⁷ September 9, 2022 R&O: <https://energja.pr.gov/wp-content/uploads/sites/7/2022/09/20220909-MI20190009-Resolution-and-Order.pdf>

⁸ US Department of Energy's DER Interconnection Roadmap: <https://www.energy.gov/sites/default/files/2025-01/i2X%20DER%20Interconnection%20Roadmap.pdf>

⁹ June 20, 2025. Submittal of LUMA's revised Smart Inverter Sheets and Responses to Stakeholder Comments to LUMA's Comments of April 25, 2025: <https://energja.pr.gov/wp-content/uploads/sites/7/2025/06/20250620-MI20190009-LUMA-Revised-Smart-Inverter-Settings-and-Responses-to-Comments-1.pdf>

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A review process may entail 1. LUMA provides the Energy Bureau with notice and justification for proposed technical updates; 2. the Energy Bureau conducts a targeted, time-bound review limited to confirming consistency with the regulation; and 3. the TIR automatically enters into effect absent the Energy Bureau's objection within the defined review window.

This approach preserves essential regulatory visibility while ensuring that operationally necessary updates. Establishing a formal but efficient update process will ensure that Puerto Rico's interconnection framework remains technically current, responsive to evolving grid realities, and fully capable of supporting safe, reliable, and scalable DER integration.

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4.0 Consumer Protection Framework for Curtailment Compensation

POSITION

LUMA maintains that compensation for non-exported energy is neither required or appropriate under Puerto Rico's governing legal regulatory, or contractual framework.

DISCUSSION AND RATIONALE

As documented in LUMA's June 20, 2025, Motion to Submit Revised Smart Inverter Settings,¹⁰ the application of smart-inverter functions, including Volt-VAR, ride-through capabilities, and carefully calibrated Volt-Watt settings, is not discretionary, but a technical obligation imposed by Regulation 8915 and the T&D OMA to ensure the safe and reliable operation of the transmission and distribution system. The Energy Bureau has already approved settings in its November 7, 2024, Resolution and Order¹¹ as mandatory grid-support functions, designed to mitigate high-voltage excursions, prevent feeder instability, maintain inverter operability during abnormal conditions, and avoid widespread tripping events. In this context, curtailment that results from protective inverter behavior is not a compensable event, but an inherent technical requirement necessary to protect grid assets and customer equipment.

Moreover, LUMA's, presented in its June 20, 2025 revised Smart Inverter Settings filing¹², show that adoption of Smart Inverter Settings significantly improves feeder performance and sharply reduces curtailment. The June 20 filing¹² also shows that enabling Volt-Watt as a secondary backstop, activated only after Volt-VAR is fully utilized, allows DER systems to remain online longer during high-voltage conditions and prevents forced inverter shutdowns, further reducing, not increasing, curtailment. LUMA's analysis is consistent with analysis by Sandia National Lab,¹³ and further demonstrates that curtailment resulting from coordinated Smart Inverter Settings deployment is minimal in systems with adequate adoption and properly configured voltage-control curves. In this analysis, it was identified that once Volt-VAR settings reach approximately 50% adoption on an individual feeder, high-voltage-related disconnections disappear, and curtailment falls to near zero as adoption approaches 60%.¹⁴

Furthermore, existing Power Purchase and Operating Agreement (PPOA) fuel and capacity-payment obligations limit the system's ability to absorb excess daytime generation that cause operational and economic penalties. These are impacts to all utility customers.

¹⁰ June 20, 2025. Submittal of LUMA's revised Smart Inverter Sheets and Responses to Stakeholder Comments to LUMA's Comments of April 25, 2025: <https://energia.pr.gov/wp-content/uploads/sites/7/2025/06/20250620-MI20190009-LUMA-Revised-Smart-Inverter-Settings-and-Responses-to-Comments-1.pdf>

¹¹ November 7, 2024. Default Smart Inverter Settings Profile (Smart Inverter Settings Sheets) Approval and Establishment of Working Group Process: <https://energia.pr.gov/wp-content/uploads/sites/7/2024/11/20241107-MI20190009-Resolution-and-Order.pdf>

¹² June 20, 2025. Submittal of LUMA's revised Smart Inverter Sheets and Responses to Stakeholder Comments to LUMA's Comments of April 25, 2025: <https://energia.pr.gov/wp-content/uploads/sites/7/2025/06/20250620-MI20190009-LUMA-Revised-Smart-Inverter-Settings-and-Responses-to-Comments-1.pdf>

¹³ May 22, 2026. LUMA's Comments on Subjects Discussed in Virtual Stakeholder Workshop: <https://energia.pr.gov/wp-content/uploads/sites/7/2026/05/20260522-MI20190009-Motion-to-Submit-LUMAs-Comments-on-Subjects-Discussed-in-the-Virtual-Stakeholder-Workshop-Held-on-March-30-2026.pdf>

¹⁴ Puerto Rico Energy Bureau. (2026, March 31). NEPR-MI-2019-0009 Virtual Stakeholder Workshop [Video]. YouTube. <https://www.youtube.com/watch?v=GiRshWVYtKM>

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For these reasons, LUMA reiterates that broad curtailment-compensation mechanisms would be unjustified, inequitable, and inconsistent with systemwide cost-fairness principles. Imposing such obligations would improperly shift DER-driven operational costs onto non-DER customers, contrary to Puerto Rico's energy policy and the cost-causation principles embedded in Joint Resolution (JR) 5-2026. The appropriate consumer-protection framework is therefore the continued refinement and full adoption of Smart Inverter Settings, not the creation of compensation structures for protective operational behavior required to maintain grid safety and reliability.

5.0 Proactive Hosting Capacity Planning

POSITION

LUMA recommends consolidating existing tools into a simplified tool and gradually enhancing as new tools are implemented, and additional operational data is collected. LUMA also supports proactive hosting-capacity planning when it is grounded in operational reality and supported by accurate system data. LUMA cautions that Hosting Capacity Analysis (HCA) cannot be used for screening, cost allocation, or proactive capital planning, limiting its operational value.

DISCUSSION AND RATIONALE

LUMA supports a simplified feeder and transformer level capacity indicator and gradually enhancing as new tools are implemented, and additional operational data is collected, building a practical foundation for a future, fully data-driven hosting-capacity planning process.

LUMA maintains transparency-oriented tools, such as feeder voltage-class maps, monthly DER-penetration maps, incremental hosting-capacity maps where field-data exist, and the DER Information Web Tool, which collectively meet existing transparency requirements.

Current gaps include incomplete Geographic Information Systems (GIS) and connectivity data, limited load and DER visibility, and lack of an integrated analytical engine, all of which inhibit full HCA functionality. Moreover, under the existing automatic interconnection framework,

Achieving the integrated data environment necessary will require sustained investment in both time and financial resources. While tools such as Advanced Metering Infrastructure (AMI) may facilitate HCA once implemented, connecting disparate systems such as GIS, AMI, SCADA, load monitoring platforms, and DER registration databases into a unified analytical engine is not a configuration task, but a multi-year capital program requiring data governance frameworks, system interoperability work, field data collection campaigns, and ongoing validation. These efforts have additional costs that would need recovery through the appropriate mechanisms. LUMA cautions against timelines that assume non existing data readiness; a phased implementation schedule tied to verifiable data milestones and supported by approved cost recovery are essential for hosting capacity planning develops into a credible, and useful process rather than a compliance exercise.

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6.0 Daytime Minimum Load (DML)

POSITION

LUMA maintains that use of Daytime Minimum Load, same as using 15% hosting capacity threshold, represents an indicative planning tool not a determinative screening criterion, as reflected throughout the May 28th Stakeholder Workshop presentation¹⁵

DISCUSSION AND RATIONALE

Data presented by Sandia Labs during the Smart Inverters Workshop on March 31st demonstrate that high photovoltaic (PV) penetration has significantly reduced daytime loads on many feeders, leading to voltage rise, reverse power flow, and increased risk of unintentional islanding¹⁶. The Interconnection Regulation should therefore incorporate provisions that recognize minimum-load risks and authorize mitigation measures. Smart Inverter Settings, including Volt-VAR, Volt-Watt, ride-through controls, and power-factor adjustments, are proven, low-cost, high-impact tools that directly reduce high-voltage events. Modeling and operational findings show that once more than 50 percent of DERs on a feeder adopt Smart Inverter Settings, high-voltage disconnects nearly disappear, with curtailment approaching zero at ~ 60 percent adoption. LUMA may also apply temporary export caps on critical feeders during specific hours to maintain safety and reliability.

LUMA's system simulations further show that voltage violations can emerge even under moderate DER penetration and that corrective performance is highly dependent on Smart Inverter behavior, not on a single numerical threshold. These conditions underscore that neither the historical 15% threshold nor any fixed percentage of DML can reliably predict interconnection feasibility across Puerto Rico's highly heterogeneous distribution system.

DML conditions create significant operational challenges for the reliable dispatch of base generation units. Challenges are more pronounced during low-demand seasons, when existing contractual obligations under current Power Purchase Operational Agreements (PPOAs) for fuel supply and generation capacity limit the operational flexibility of certain base units. In addition, the geographic location of these units under PPOAs may require adjustments to the security-constrained economic dispatch (SCED). Compounding these issues is the need for resources capable of rapid start-up and fast response to accommodate the steep afternoon ramp, which can rise between 700 and 1,100 MW in fewer than five hours.

Accurate calculation of DML requires detailed, real-time, and historical DER operational data, including inverter output and per-site curves, that LUMA does not possess. This data is held by developers and manufacturers and is not provided in a format that can be validated, standardized, or integrated into LUMA's SCADA, GIS, or feeder modeling environments. Developing the necessary telemetry-- including widespread Advanced Metering Infrastructure, ingestion process, verification protocols, cybersecurity safeguards, and analytical toolchain would require significant system integration work and funding that do not presently exist within the regulatory framework. For these reasons, LUMA supports continued refinement of technical indicators and maintains such thresholds exist as guidance, applied within a broader review process that accounts for Smart Inverter capability, feeder topology, voltage-performance

¹⁵ Refer to Footnote 15.

¹⁶ May 22, 2026. LUMA's Comments on Subjects Discussed in Virtual Stakeholder Workshop: <https://energia.pr.gov/wp-content/uploads/sites/7/2026/05/20260522-MI20190009-Motion-to-Submit-LUMAs-Comments-on-Subjects-Discussed-in-the-Virtual-Stakeholder-Workshop-Held-on-March-30-2026.pdf>

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history, and operational data. This preserves system safety and reliability while allowing evolving analytical tools.

7.0 Allocation of Grid Study Costs

POSITION

LUMA supports establishing a clear, equitable, and predictable cost-allocation framework for interconnection applications and study costs.

DISCUSSION AND RATIONALE

Consolidating study costs into the initial application fee ensures that all necessary evaluations are funded from the outset, creating a more equitable and administratively efficient framework for both applicants and the utility. These activities are resource-intensive and must be uniformly recoverable across all interconnecting customers to prevent cost-shifting to non-DER ratepayers.

As LUMA presented in the May 28th Stakeholder Workshop¹⁷, unfunded Supplemental Studies for systems under 25 kW create operational and financial strains, including undetected grid vulnerabilities, and erosion of proactive planning. For larger systems, LUMA recommends fixed and tiered fee structures (e.g., a fixed fee for systems under 25 kW, distinct fixed fees for 25–300 kW and above 300 kW, and system-specific studies for >1 MW), aligned with system size and complexity. This approach aligns with industry norms, reduces administrative burden, and supports the safe and efficient integration of DERs.

In addition, as explained by LUMA, any cost structure must reflect the actual components that drive studies, including feeder-level cluster analyses, GIS cartography validation, modeling of aggregated DER impacts, transformer-loading assessments, voltage-impact evaluations, protection-coordination reviews, and any required refinement of hosting-capacity data.

LUMA proposes a refined structure consisting of:

- One fixed fee for systems under 25 kW, which accounts for approximately 99 percent of applications
- Separate fixed fee for systems between 25 kW and 300 kW
- Another fixed fee for systems above 300 kW, with systems specific studies reserved for projects exceeding 1 MW due to their unique technical requirements

¹⁷ May 27, 2026. Submittal of LUMA's Presentation for Virtual Stakeholder Workshop Scheduled for May 28, 2026: <https://energia.pr.gov/wp-content/uploads/sites/7/2026/05/20260527-MI20190009-Motion-to-Submit-LUMAs-Presentation-for-Virtual-Stakeholder-Workshop-Schedule-for-May-28-2026.pdf>

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8.0 Queue Transparency and Data Reporting Improvements

POSITION

LUMA believes that reporting requirements must be streamlined and simplified. Multiple DER-related reporting obligations exist, and LUMA recommends consolidating all DER reporting into a single, instrument, or align required indicators. LUMA further recommends SGIP/SGIA aligned processes, shared responsibilities, resource aligned timelines and enforcement mechanisms.

DISCUSSION AND RATIONALE

INDICATORS

A consolidated reporting framework would enable all stakeholders to track meaningful, system-level indicators without creating conflicting or redundant reporting obligations.

In refining queue-related reporting, the Interconnection Regulation must clearly differentiate between utility and applicant review time. As shown on the May 28th Stakeholder Workshop¹⁸ stalled or slow projects overwhelmingly result from incomplete or inaccurate submissions, incorrect or mismatched documentation, and insufficient developer guidance to customers regarding hosting capacity, transformer limitations, and aggregated DER impacts.

Accordingly, queue transparency indicators should also incorporate applicant timeline and applicant-side actions remain outstanding, Applicant timelines must also be accompanied associated enforcement mechanisms, to ensure that applicants take timely action and that queue integrity is preserved for all applicants. This balanced and consolidated approach to reporting, one that reflects shared responsibilities, avoids duplicative efforts, and accurately represents the drivers of interconnection progress, will address transparency goals while ensuring efficient regulatory oversight.

PROCESSES

As presented in the May 28th Stakeholder Workshop, delays frequently arise from incomplete designs, missing documentation, misaligned construction activity, and unresolved substation or easement requirements, factors entirely outside the utility's control and must not count against the utility's statutory timeline. Median customer response times for projects above 25 kW exceed 500 days in the distribution process and over 290 days in the transmission process, compared to LUMA's typical 10 to 25 days for its internal engineering steps¹⁹.

The correct procedural sequence should be:

1. Applicant submits initial materials, including an Illustrative Diagram
2. LUMA performs a preliminary assessment of grid capacity and technical feasibility
3. LUMA issues an Evaluation Letter specifying technical requirements

¹⁸ Refer to Footnote 19.

¹⁹ May 27, 2026. Submittal of LUMA's Presentation for Virtual Stakeholder Workshop Scheduled for May 28, 2026: <https://energia.pr.gov/wp-content/uploads/sites/7/2026/05/20260527-MI20190009-Motion-to-Submit-LUMAs-Presentation-for-Virtual-Stakeholder-Workshop-Schedule-for-May-28-2026.pdf>

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4. One applicant has met these requirements and submits a complete and final Design Blueprint, the application enters the Endorsement Phase and becomes eligible for the mandated evaluation period

This sequence will better align the timeline with the point at which the utility can review the definitive project design.

This approach is fully consistent with Law 17-2019 mandate for orderly, safe interconnection processes²⁰ and the burden of technical due diligence placed on the system operator.

EXPANDED PROPONENT RESPONSIBILITY

LUMA recommends that the Interconnection Regulation formally recognizes an expanded developer responsibility framework. Developers typically serve as the primary point of contact for customers during the earliest stages of DER project development, and bear clear responsibility for communicating applicable regulatory, procedural, and technical requirements to their clients. Because proponents are directly involved in system design, application preparation, and customer guidance, assigning them explicit responsibility for ensuring that customers understand interconnection requirements will materially improve the quality and accuracy of submitted applications.

Moreover, extending this responsibility aligns naturally with complementary measures, such as enhanced penalties or deposits for premature or incomplete applications, which are designed to encourage procedural discipline and promote informed engagement by all participants. Together, these reforms strengthen the regulatory framework by ensuring that applicants and their representatives proceed with a full understanding of their obligations.

RESOURCE-ALIGNED TIMELINES

Aligning timelines with the complexity of the tasks and the resources required must be recognized. Technical, engineering, and compliance evaluations, particularly those associated with safety assessments, hosting-capacity analyses, supplemental studies, and system-impact determinations, require appropriate staffing, data availability, system modeling, and quality-control procedures. Establishing timelines that are proportionate to these resource requirements will allow the system operator to issue timely and defensible determinations without compromising analytical quality or system integrity along with a reduced the risk of incomplete evaluations, avoid procedural bottlenecks, improve transparency for applicants, and support an orderly and predictable interconnection process.

ENFORCEMENT

LUMA emphasized the current absence of essential enforcement tools for enforcing adherence to regulatory mandates. One potential mechanism is the implementation of a Penalty and Deposit Framework. Such a framework is designed to deter practices that undermine orderly processes and compromise system reliability. Such a framework would establish enforceable consequences for premature or speculative applications, failure to satisfy outstanding obligations, initiation of unauthorized construction, and the commissioning of DER facilities without prior approval.

²⁰ Puerto Rico Energy Public Policy Act No. 17-2019. <https://bvirtualogp.pr.gov/ogp/Bvirtual/leyesreferencia/PDF/2-ingles/17-2019.pdf> Ley de Política Pública Energética: <https://energija.pr.gov/wp-content/uploads/sites/7/2025/03/17-2019.pdf>

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9.0 Meter Socket Adapters

POSITION

LUMA acknowledges the potential customers facing benefits of Meter Socket Adapters (MSAs), but stresses that their deployment must meet essential legal and regulatory requirements to ensure system safety, meter functionality, worker protection, and operational reliability.

DISCUSSION AND RATIONALE

As LUMA discussed in the May 28th Stakeholder Workshop²¹, as per Regulation on General Terms and Conditions for the Provision of Electric Power Regulation 7982, Section IX, Article A “Meters and any other equipment or materials supplied or installed by the Authority remain its property, and the Authority has the right to remove, disconnect, inspect, repair, or replace such equipment and materials at any time it deems necessary. The customer and any other person who is not an employee of the Authority are prohibited from operating, tampering with, or interfering with the metering equipment, conductors, transformers, seals, and meter rings, or any other device that is part of the Authority’s installation. When the intervention is conducted by the Authority at the customer’s request and for the customer’s exclusive benefit, the customer shall pay the costs of such intervention.”²² MSA installations affect the interface between customer equipment and utility-owned metering infrastructure and therefore require strict validation to ensure that meter functionality including accurate billing, communications, remote connect/disconnect capability, and equipment protection are not compromised. LUMA’s identified necessary safeguards such as verifying compliance with utility mounting standards for 1S and 2S meter forms, ensuring technician and customer safety, confirming that network devices maintain AMI communication integrity, and clearly defining responsibilities for installation, inspection, and troubleshooting. In addition, every installation must include coordination with LUMA for authorization, certification, and notification to prevent interference with meter operations and to preserve LUMA’s authority to inspect or remove MSAs when needed to protect system.

Furthermore, the introduction of MSA-based pathways would require dedicated utility resources, including additional metering personnel, and associated funding to ensure that the cost of MSA adoption is not subsidized by non-participating customers. LUMA stresses that implementation must occur through a regulated, utility-supervised procedure rather than permissive or installer-driven approaches that could create uneven safety practices or unintentionally undermine grid protection functions.

Accordingly, LUMA recommends that if the Interconnection Regulation includes the use of MSAs, it establishes a clear, utility-led certification and approval framework, including defined technical criteria, installation protocols, and reporting requirements, while ensuring LUMA retains the necessary authority to safeguard system reliability and metering integrity.

²¹ Refer to Footnote 22.

²² Regulation on General Terms and Conditions for the Provision of Electric Power No. 7982 of Jan 14, 2011 (P.R. Elec. Power Auth.), § IX(A): <http://app.estado.gobierno.pr/ReglamentosOnLine/Reglamentos/7982.pdf>

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10.0 Other items raised during June 2nd Technical Workshop

To support the ongoing development of a modernized interconnection framework, LUMA provides the following summary of key issues and recommendations discussed with the Puerto Rico Energy Bureau during a virtual meeting held on June 2, 2026. This information reflects LUMA's current assessment of grid conditions, the impacts of accelerating DER growth, and the regulatory actions needed to ensure system reliability and public safety. LUMA underscored the need for legislative action to provide the authority to limit interconnections when system safety or reliability is compromised. LUMA reiterated that modernization of the DER regulatory framework requires a clear separation between procedural interconnection requirements and technical interconnection standards.

IMPACTS OF RAPID DER GROWTH AND LOW OR NO COST MITIGATION

Current grid conditions continue to be significantly affected by the rapid and uncontrolled growth of distributed energy resources. More than 121 substations and 145 circuits are operating above 90 percent of load capacity, and 105 circuits exceed 100 percent of load capacity. Feeder and substation saturation, increased overvoltage complaints, and a substantial reduction in DML.

As mitigation strategies, LUMA carefully manages its operational dispatch. However, export limits may become necessary if present trends persist.

To address voltage issues in the near term, LUMA proposed low-cost corrective actions. These include activating Volt/VAR functions and targeting Volt/Watt settings on existing photovoltaic systems, implementing export-limiting controls on critical feeders, reconfiguring feeders, and standardizing voltage levels, and improving system visibility through advanced metering infrastructure and telemetry.

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ANNEX 1: Comparative Interconnection Processes and Cost Responsibilities Across U.S. Jurisdictions

This section provides comparison of interconnection processes, cost responsibilities, and technical requirements across several U.S. jurisdictions with mature distributed energy resource (DER) integration frameworks.

LUMA explored the Interconnection Process and Costs from multiple jurisdictions. The findings are summarized in the table below and provide a structured comparison of interconnection processes, cost responsibilities, and technical requirements across Hawaii, California, and Vermont. These jurisdictions have established distributed energy resource integration practices supported by clear cost-causation principles and enforceable technical standards. These jurisdictions consistently place responsibility for interconnection costs, engineering studies, and required system modifications on developers while maintaining utility authority over technical criteria needed for safe and reliable grid operation. This comparison is relevant to Puerto Rico, which faces unique grid challenges including high distributed solar penetration, declining daytime minimum load, feeder voltage instability, and constraints associated with aging infrastructure. Strengthening interconnection rules in Puerto Rico requires alignment with national best practices and adaptation to local realities

Jurisdiction	Hawaii	California	Vermont	Puerto Rico (LUMA's proposal)
Key Strengths	Mandatory advanced inverter functions (Volt-VAR, Volt-Watt), plus policies on updating legacy inverters ^{23 24}	CPUC and utilities provide advanced hosting capacity maps, tools, and training ^{25 26}	Strong cost causation and predictable fees ²⁷	Single regulation was proposed with improved transparency and smart inverter adoption

²³ Hawaii PUC Rule 14: https://www.hawaiianelectric.com/documents/billing_and_payment/rates/hawaiian_electric_rules/14.pdf

²⁴ Customer Energy Resource (CER) Equipment- Hawaiian Electric: <https://www.hawaiianelectric.com/products-and-services/smart-renewable-energy-programs/especially-for-contractors/customer-energy-resource-%28cer%29-equipment>

²⁵ California Public Utilities Commission (CPUC) Smart Inverters Group: <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/rule-21-interconnection/smart-inverter-working-group>

²⁶ CPUC Electric Rule 21: Generating Facility Interconnections: <https://www.cpuc.ca.gov/rule21/>

²⁷ Vermont Public Utilities Commission Rule 5500: <https://puc.vermont.gov/sites/psbnew/files/documents/5500-interconnection-procedures-for-proposed-electric-generation-resources-and-energy-storage-devices.pdf>

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Jurisdiction	Hawaii	California	Vermont	Puerto Rico (LUMA's proposal)
Cost Responsibility	Developer compensation for all system upgrades that DER integration requires ²⁸	Standard interconnection costs are covered by the developer ²⁶	All upgrade costs are on the developer ²⁷	All upgrade costs are on the developer ²⁹
Inverter Requirements	Updates of legacy inverters to activate additional grid-support functions for DER programs ²⁸	Mandatory smart inverters required, with autonomous grid support functions ²⁶	Requirement of UL1741 Inverters (Smart Inverters) for independent power systems ²⁷	Mandatory smart inverter settings for all DERs installed after 8915 issued
Customer Application Fee	No Interconnection Fee for customer ³⁰	<1MW: \$145 Interconnection fee and \$0 Supplemental Review fee >1MW: \$800 Interconnection fee and \$2500 Supplemental Review fee (if necessary) ³¹	Projects >150 kW: \$600 or utility tariff amount. Projects ≤150 kW: no fee unless tariff specifies.	Study costs are on developer ²⁹

²⁸ State of Hawaii Public Utilities Commission- DER Policies Technical issues: <https://puc.hawaii.gov/energy/der/technical-issues/>

²⁹ Regulation 8915: <http://app.estado.gobierno.pr/ReglamentosOnLine/Reglamentos/8915.pdf>

³⁰ Hawaiian Electric, Smart Renewable Energy Non-Export: <https://www.hawaiianelectric.com/products-and-services/smart-renewable-energy-programs/smart-renewable-energy-non-export>

³¹ Rule 21- California: <https://www.pge.com/en/about/doing-business-with-pge/interconnections/electric-generation-interconnection.html#accordion-1ed8fee76d-item-edc513049e>

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Jurisdiction	Hawaii	California	Vermont	Puerto Rico (LUMA's proposal)
Relevance to Puerto Rico	Hawaii's approach to smart inverter activation mirrors what LUMA proposes, with island-grid dynamics and voltage control triggering needs	Demonstrates hosting capacity map's effectiveness at reducing interconnection study burdens	Reinforces LUMA's cost allocation proposals, highlighting developer responsibility and standardized smart inverter settings	Integrate national best practices into local regulation

Local Puerto Rico Grid Conditions:

Puerto Rico's electrical system faces unique operational risks due to extremely high penetration of distributed photovoltaic systems, reduced daytime minimum load, and frequent voltage excursions on distribution feeders. Operational flexibility is restricted by power purchase and operating agreements that require minimum generation levels from certain units, limiting the ability to reduce output during midday. Limited real-time visibility into DERs further increases reliance on autonomous inverter functions to maintain voltage stability and avoid disconnection events.

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ANNEX 2. Hawaii Smart Inverter Settings Implementation

SMART INVERTER REQUIREMENTS

On February 7, 2018, Order 35268 gave final approval for the Hawaiian Electric Company (HECO) grid modernization plan³². HECO implemented Smart Inverter requirements due to its ongoing urgent grid challenges, caused by extreme high rooftop PV penetration, overvoltage, frequency deterioration, and reliability challenges that required inverter-based autonomous support for safe grid operation. Retroactive application of certain smart inverter requirements was done because legacy inverters posed a stability risk. HECO worked with Enphase to implement wider trip settings to legacy devices remotely. This allowed a large installed base to be upgraded without costly site visits.³²

Volt-Var and Volt-Watt functions are effective strategies for addressing elevated customer voltages caused by behind-the-meter solar PV systems. For the Volt-Var curtailment settings used in Hawaii, the resulting PV energy production is typically near zero. When the downward-sloping section of the Volt-Watt curve is positioned above ANSI Range B. (1.06), Volt-Watt control offers an added safeguard against occasional high-voltage events while keeping curtailment nearly zero. Many commercially available inverters can react to frequency disturbances in less than a second, depending on the model. A rapid inverter response is especially critical to mitigate frequency events in low inertia systems³³.

COMPARATIVE ANALYSIS: HAWAII VS PUERTO RICO

Hawaii's adoption of Institute of Electrical and Electronics Engineers (IEEE) 1547-2018 smart inverter functions serves as a practical example for Puerto Rico. Hawaii implemented these advanced capabilities in response to escalating operational challenges driven by exceptionally high rooftop PV penetration, including persistent overvoltage conditions, deteriorating frequency stability, and widespread reliability risks. Regulatory records and National Renewable Energy Laboratory (NREL) analyses demonstrate that these conditions made autonomous inverter-based grid support an operational necessity. In response, Hawaii's utilities and regulators deployed IEEE 1547 defined voltage-regulation and frequency ride-through functions to maintain system stability under increasingly variable grid conditions. Puerto Rico's regulatory framework, including Regulation 8915, already anticipates compliance with applicable IEEE 1457 standards, and LUMA's Technical Bulletins and Smart Inverter Settings filings show that Puerto Rico is now experiencing analogous system stresses.

Hawaii's experience also demonstrates the feasibility and reliability benefits of adopting updated smart inverter settings to legacy systems. NREL documentation confirms that older inverters contributed to mass-disconnection events due to narrow trip settings and insufficient grid-support functions. Hawaiian Electric addressed these risks by coordinating with manufacturers to implement remote firmware updates that expanded ride-through ranges and improved disturbance performance without requiring hardware

³² See Decision and Order No. 35268:

https://www.hawaiianelectric.com/Documents/about_us/investing_in_the_future/dkt_2017_0226_2018_02_07_PUC_decision_and_order_35268.pdf

³³ Smart Inverter Utility Experience in Hawaii. National Renewable Energy Laboratory (NREL). Presented at the IEEE PES General Meeting Tutorial on Smart Inverters for Distributed Generators, Atlanta, GA (Aug. 4, 2014):

<https://docs.nrel.gov/docs/fy19osti/74091.pdf>

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replacement. This approach enabled rapid, low-cost upgrades across a large installed base and produced measurable improvements in grid stability.

Puerto Rico’s operational data supports a similar evidence-based approach. As reflected in LUMA’s 2024–2025 filings, most post-Regulation 8915, DER systems are already technically capable of meeting IEEE 1547-2018 settings. LUMA has further documented increased high-voltage events, ride-through deficiencies, imbalance conditions, and inverter cascades, which parallel the issues previously observed in Hawaii. These filings underscore that selective alignment with IEEE 1547-2018 for systems installed after Regulation 8915 came into effect and implementation is critical to address reliability concerns.

Experience from Hawaii also confirms the effectiveness of Volt-Var and Volt-Watt functions for mitigating abnormal voltage conditions while maintaining negligible curtailment during normal operation. Puerto Rico’s revised Smart Inverter Settings align with this approach by designating volt-var as the primary voltage-control mechanism and volt-watt as an emergency safeguard. Puerto Rico’s small, low-inertia grid experiences even greater frequency variability than Hawaii, and many inverters deployed locally already meet UL-1741 SB and can respond to disturbances within one second. These conditions support the timely activation of the full suite of IEEE 1547-2018 autonomous functions as a necessary and technically feasible measure to preserve system reliability.

Aspect	Hawaii	Puerto Rico (LUMA)
System Coverage	Retrofitting mandatory for existing inverters; certified via QEL	Currently only adopted by new systems; existing installations have not adopted settings
Regulatory Framework	PUC orders 37066–40574; Rule 14H aligning with IEEE 1547	Legislative authority via PREB; Regulation 8915; Article 9 of Act 114.
Implementation Method	OEM firmware upgrades and utility incentives	LUMA published default setting sheets; mandatory post-January 2025
Certification and Tracking	HECO’s QEL tracks compliant firmware versions	Setting sheets submitted and approved by Energy Bureau; no QEL exists
Scale and Scope	Large-scale retrofits across islands	Over 42,000 new systems with smart inverter settings adopted since January 2025