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

IN RE:
INTERCONNECTION REGULATIONS

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

SUBJECT: Submittal of LUMA's Presentation for Virtual Stakeholder Workshop Scheduled for May 28, 2026

MOTION TO SUBMIT LUMA'S PRESENTATION FOR VIRTUAL STAKEHOLDER WORKSHOP SCHEDULED FOR 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 May 20, 2019, this Puerto Rico Energy Bureau of the Public Service Regulatory Board ("Energy Bureau") issued a Resolution and Order in which it opened Case No. NEPR-MI-2019-0009 to address the process to modify the interconnection regulations.

2. On July 15, 2021, the Energy Bureau issued a Resolution and Order in which it consolidated Cases No. NEPR-MI-2019-0009 and CEPR-MI-2018-008, notified that it had developed a draft for a new comprehensive interconnection regulation ("Preliminary Draft"), and invited stakeholders to provide comments on this Preliminary Draft, on or before July 30, 2021.

3. On July 30, 2021, LUMA submitted preliminary comments to the Preliminary Draft.[1]

4. On November 15, 2021, LUMA submitted additional comments to the Preliminary Draft and a proposed draft Technical Interconnection Requirements document ("TIR"). [2]

5. On May 19, 2022, LUMA submitted to the Energy Bureau a more comprehensive draft TIR.[3]

6. On September 9, 2022, the Energy Bureau issued a Resolution and Order granting LUMA until October 7, 2022, to file the additional comments and requesting stakeholders and interested persons to provide comments relating to LUMA's comments to the Preliminary Draft, among others.

7. On November 1, 2021, LUMA submitted additional comments on the Preliminary Draft.[4]

8. On March 19, 2026, the Energy Bureau issued a Resolution and Order ("March 19th Resolution") indicating that, in light of the provisions of the House of Representatives' Joint Resolution 193, signed by the Governor on January 7, 2026 ("RC 193"), the Energy Bureau was "resum[ing] the administrative processes in this case for the purpose of completing and adopting interconnection rules in line with current energy public policy"; that as part of this process the Energy Bureau was required to conduct workshops with interested entities to consider new inputs

[1] *See* LUMA's *Motion Submitting LUMA's Comments to Preliminary Draft of Proposed Generating Facility and Microgrid Interconnection Regulation*.
[2] *See* LUMA's *Motion to Submit Additional Comments to Preliminary Draft of Proposed Generating Facility and Microgrid Interconnection Regulation* of that date.
[3] *See Motion Submitting Complete Version of Technical Interconnection Requirements Document* of that date.
[4] *See Motion to Submit Additional Comments.*

and feedback from stakeholders before the issuance of a draft interconnection regulation by July 7, 2026; and that this rulemaking process must be completed by January 7, 2027.[5]

9. In the March 19th Resolution, the Energy Bureau set forth a list of key issues that the Energy Bureau understood remained unresolved in connection with the Preliminary Draft and invited all stakeholders and interested persons to provide their comments and feedback on these issues on or before April 15, 2026.[6]

10. On April 15, 2026, LUMA submitted its comments on the list of key issues.[7]

11. On April 27, 2026, the Energy Bureau issued a Resolution and Order 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. The Energy Bureau ordered LUMA to attend this workshop and to provide a thirty (30)-minute presentation addressing the topics listed in the Resolution and Order ("April 27th Order"), while inviting other stakeholders to also present and requiring all stakeholders to submit copy of their presentations by no later than 2 p.m. on May 27, 2026.

II. LUMA's Presentation

12. In compliance with the April 27th Order, LUMA submits herein the presentation it will provide during the Virtual Stakeholder Workshop to be held on May 28, 2026. *See Exhibit 1*.

[5] *See* March 19th Resolution, p. 2.
[6] *See id*.
[7] *See Motion to Submit LUMA's Comments on Key Issues Relating to Preliminary Draft of Interconnection Regulation.*

WHEREFORE, LUMA respectfully requests this honorable Energy Bureau to **take notice** of the above and **accept** LUMA's presentation for the Virtual Stakeholder Workshop to be held on May 28, 2026, included in *Exhibit 1*.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 27th day of May 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; agustn.irizarry@upr.edu; javrua@sesapr.org; hrivera@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; rmoody@cleanpower.com; axelvargas.montanez@gmail.com.

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EXHIBIT 1

LUMA's Presentation for Virtual Stakeholder Workshop on May 28, 2026

LUMA

Interconnection Regulation

NEPR-MI-2019-0009

March 28, 2026

Agenda

- Operational Challenges
- LUMA's Comments
- Current Interconnection Process for DER < 25 kW
- Current Interconnection Process for DER > 25 kW
- Interconnection Queue Management and Public Transparency
- Status of Hosting Capacity
- LUMA Recommendations on JR 5-2026 Topics

Operational Challenges

- Distributed Energy Resources (DER) use, such as solar, has grown rapidly, and systems are interconnected to a grid that was not originally built to support them
- Many circuits are now overloaded, creating voltage issues for thousands of customers
  - 121+ substations and 145 circuits now operate **above 90%** load
  - 105 circuits exceed **100%** of daytime design capacity
- Thousands of customers report high-voltage problems linked to overloaded feeders
  - Over 25,000 high-voltage customer complaints reviewed;
    - 21,000+ linked to DER-overcapacity feeders
    - **70%** of correlated complaints came from DER customers or neighbors sharing a transformer
  - High DER penetration reduces minimum daytime load, lowering system inertia and stability

Interconnection Regulation Comments

- LUMA's comments* proposed a unified framework that:
  - provides for screening **of projects before injection**, to ensure safety and reliability
  - **technology agnostic,** enabling for integration of new and future technologies
  - maintains **interconnection requirements apart from customer programs**, making technical considerations separate from options on how to operate a project

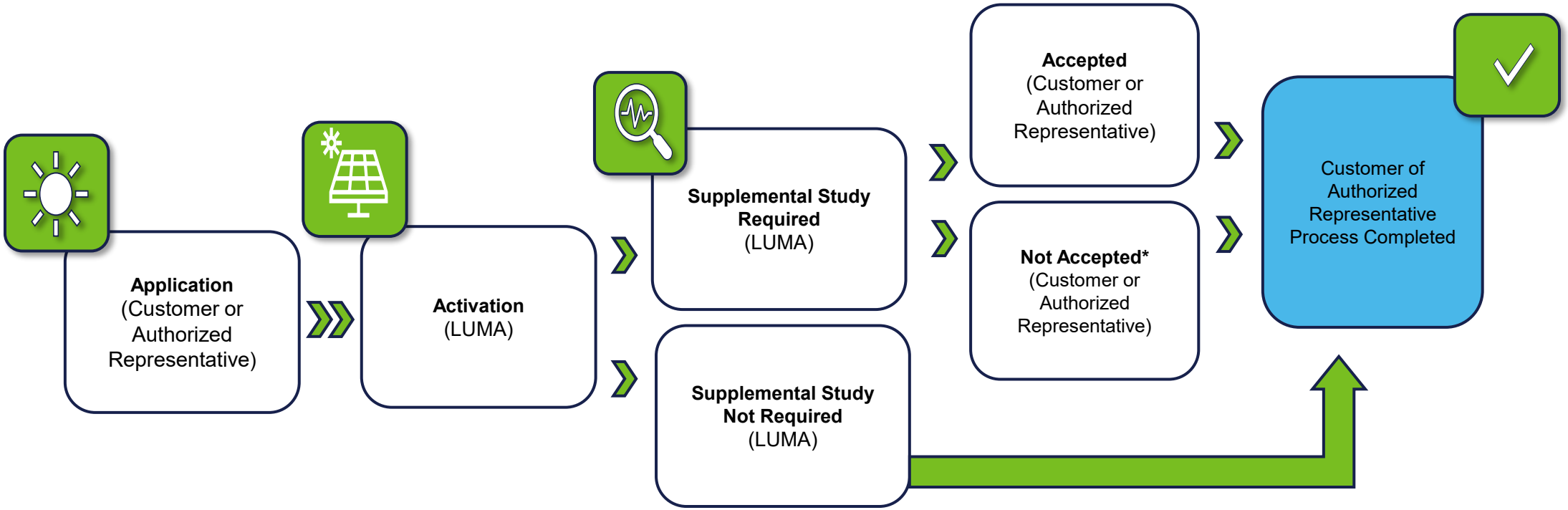
***LUMA's comments:** https://energia.pr.gov/wp-content/uploads/sites/7/2026/04/20260417-MI20190009-Motion-to-Submit-Corrected-Exhibit-1-to-Motion-to-Submirt-Lumas-Comments.pdf

Current Interconnection Process
DER < 25 kW

Overview of Workflow

Current Application Process for DER < 25 kW

As implemented prior to JR 5-2026 Based on Regulation 8915



Associated Fees and Costs

Current application fees for DER < 25 kW

Issues with unfunded studies	
Undetected Grid Vulnerabilities	• Grid operator can miss impacts, e.g. thermal overloads, stability issues, or reliability hazards, compromising grid safety and performance
Socialization of Upgrade Costs	• Financial burden shifts to all utility customers, increasing expenses for all ratepayers
Erosion of Proactive Infrastructure Investment	• Upgrades respond to known needs. Waiving funding may divert from planned grid enhancements, leading to a cycle of incremental patches rather than strategic modernization

Application Fee: $100.00

Supplemental Study Fee: ~~$300.00~~*

*JR 5-2026: Mandates that Supplemental Study fee is no longer collected for <25 kW systems.

Average Timeframes

Standard review and approval timeframes for DER < 25kW

Process	Tasks	Days
Evaluation	Complete Documents Submittal	Customer
	Project Documents Validation	≤30
Net Metering Activation	Meter Verification and Tariff Applied to Customer	

Factors that influence delays

- Delays frequently are the result of the receipt of incomplete or incorrect information
- Response time requirements for customers are not defined

Recommendations

Associated Fees and Costs

- Consolidate application, study, and upgrade fees in the application fee for systems under 25 kW
- Fixed fee for systems under 25 kW, which represent ~99% of cases

Average Timeframes

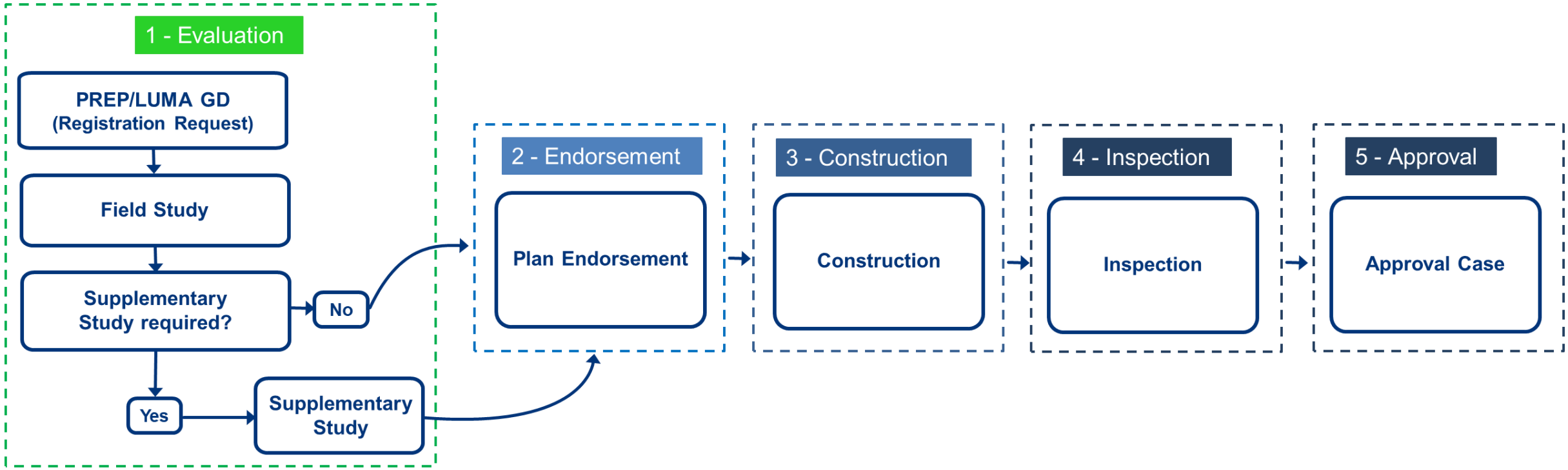
- Define timelines for customer actions
- Provide enforcement mechanisms like automatic disconnection under certain conditions

LUMA

Current Interconnection Process
DER > 25 kW

Overview of Workflow

Current Application Process for Distribution Systems > 25 kW



Associated Fees and Costs

Current Application and Studies Fees for Distribution Systems > 25 kW

System	Application	Supplemental Study	Improvements	Telecom
DER > 25 kW to ≤ 100kW	$250	$2,000	Actuals	N/A
DER > 100 kW to ≤ 1 MW	$500	$5,500	Actuals	N/A
> 1MW	Actuals	Actuals	Actuals	Actuals

Average Timeframes

Standard review and approval timeframes for Distribution Systems > 25kW

Process	LUMA - Business Days Median (FY25/FY26)	Customer - Business Days Median (FY25/FY26)
Evaluation	25	504
Endorsement	12.5	84
Construction	----	121
Inspection	18	94
Approval	32 days (Billing and commercial)	----

Note: Project timeline is primarily driven by customer activities. Process agility is directly linked to accuracy and completeness of initial submittals. Each instance requiring corrections or additional information can reset the review cycle, which may extend the overall schedule.

Average Timeframes

Factors that influence timeline for Distribution Projects on LUMA Side

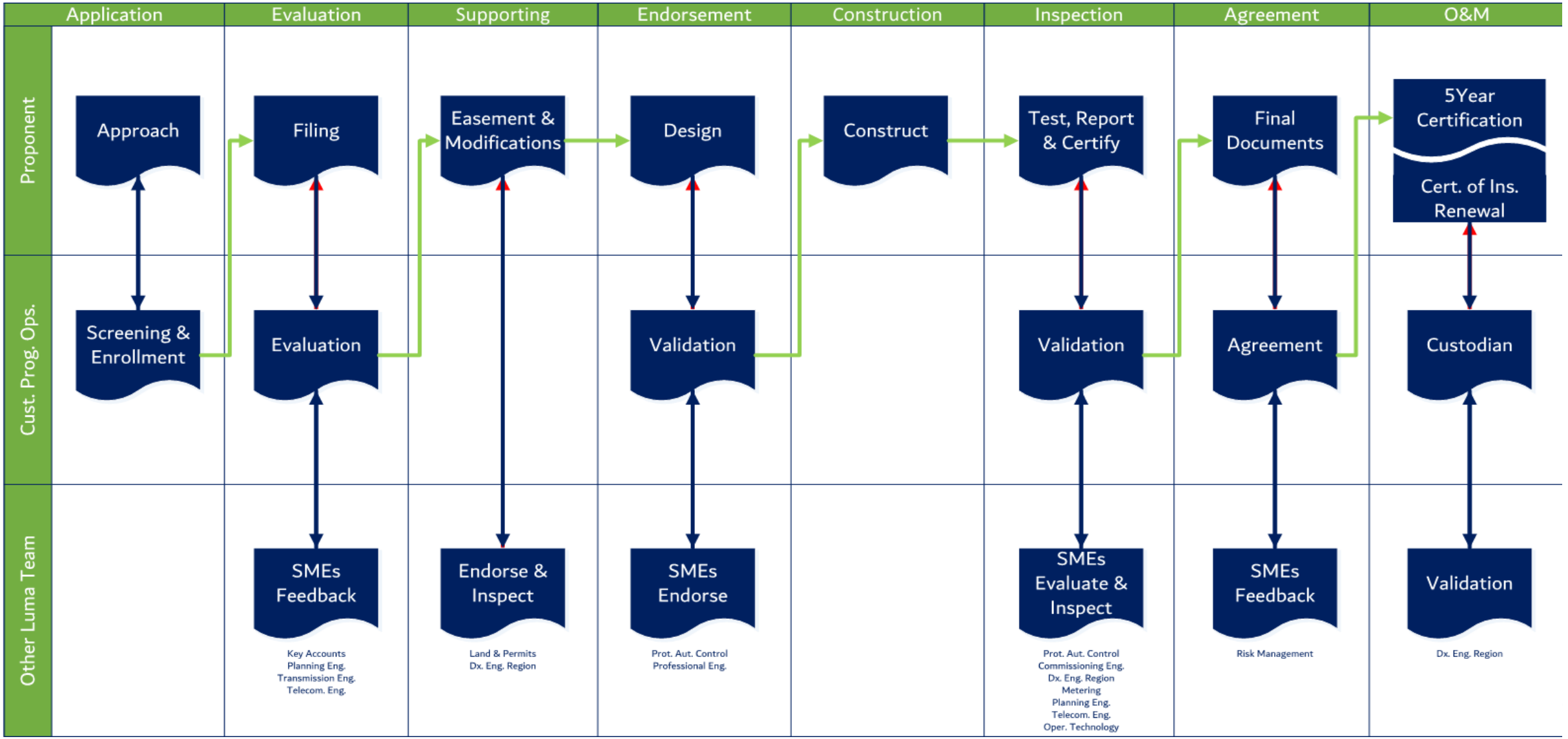
- Feeder Saturation and Infrastructure Capacity
- Protection Requirements and Coordination
- High Penetration of Distributed Generation
- Circuits Operating at Maximum Capacity

Factors that influence delays for Distribution Projects on Customer Side

- Lack of Understanding of Technical Requirements
- Difficulty Obtaining Professional Documents
- Missing or Incomplete Information From Developer
- Limited Technical Knowledge
- Poor Communication Between Customer and Developer

Overview of Workflow

Current Application Process for Transmission Systems > 25 kW



Associated Fees and Costs

Current Application and Studies Fees for Transmission Interconnected Systems

System	Application	Study	Improvements	Telecom
All sizes	$500	Actuals	Actuals	Actuals

Average Timelines

Standard review and approval timeframes for Transmission Systems > 25kW

Process	LUMA - Business Days (FY25/FY26)	Customer - Calendar Days Median (FY25/FY26)
Evaluation	20	100
Endorsement	10	299
Construction	----	251
Inspection	40	224
Approval	20 (Billing and commercial)	16

Note: Project timeline is primarily driven by customer activities. Process agility is directly linked to accuracy and completeness of initial submittals. Each instance requiring corrections or additional information can reset the review cycle, which may extend the overall schedule.

Average Timeframes

Factors that influence timeline for Transmission Projects

- Unauthorized Commissioning
- Aggregated Capacity Threshold Compliance
- Premature Submissions Driven by Funding Milestones
- Unresolved Easement and Substation Modifications at Endorsement
- Misalignment between Construction Activity and Endorsement Timing
- Regulatory Interpretation Affecting Project Sequencing
- Power Factor Compliance
- SCADA Telecommunications Technology Flexibility

Recommendations

Process Workflows

- Compliance with applicable protection, safety and operational standards, including Protection Automation and Control (PAC) review for project > 500 kW
- Technology-appropriate Supervisory Control and Data Acquisition (SCADA) telecom options and allow private Long-Term Evolution (LTE) with dedicated Access Point Name (APN).

Associated Fees and Costs

- Provide predictability
- Fixed fee for systems >25 kW and <300 kW, and a separate fee for systems >300 kW
- Cost recovery to align with system size and complexity
- System-specific studies for systems greater than 1 MW

Average Timeframes

- Define timelines for customer actions. Provide enforcement mechanisms
- Delays mainly customer side; corrections, missing documents, unresolved substation/easement requirements reset cycle
- Factor number of business days needed for review of complete documentation submitted by customer

Interconnection Queue Management and Public Transparency

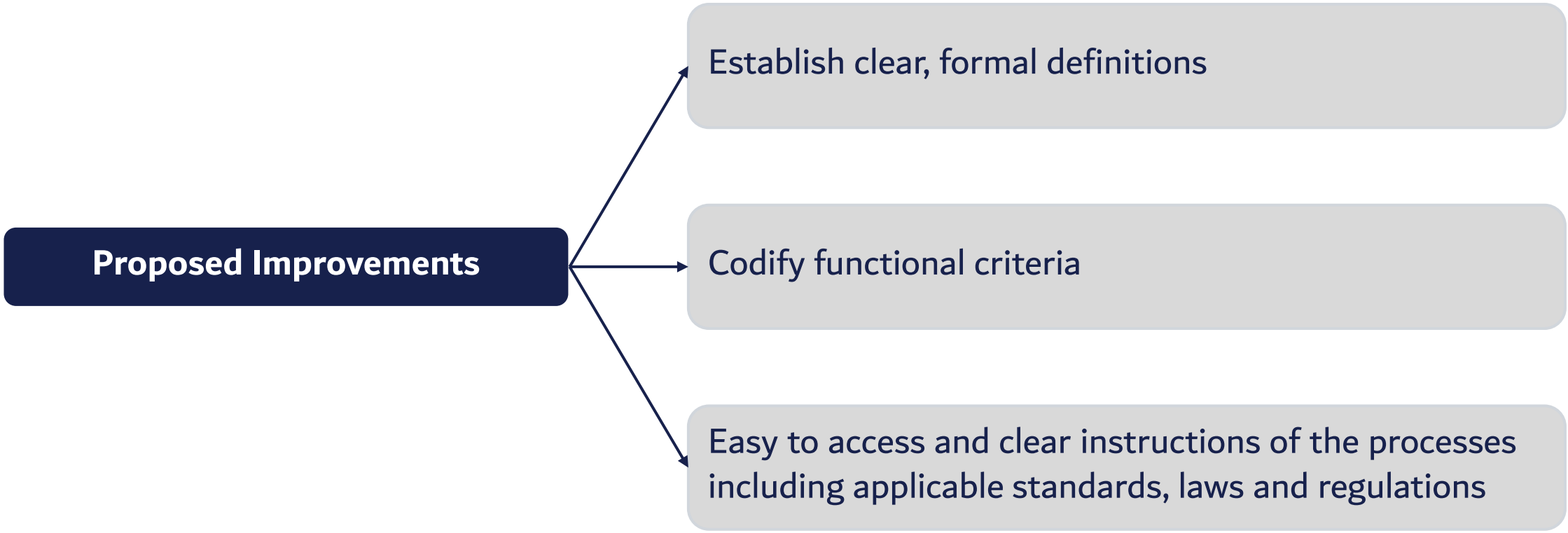
Queue Management

- Queue integrity is critical component of interconnection process, it ensures projects are evaluated and processed in a fair, orderly, and technically consistent manner
- Maintaining integrity of the queue protects both customers and utility by preserving equitable treatment and preventing disruptions from projects bypassing established procedures
- Small DER cases are processed in parallel; large DER (>25 kW) follow sequential engineering review
- Implementing for small DERs would be burdensome, though may be feasible for larger systems (>25 kW) and transmission-level projects if application portal is enhanced

Transparency

- Transparency remains a core component of the process, though every project is not publicly accessible
- Should remain a core feature in any platform
- Customers can see status of their application at each stage
- Customers and developers retain direct visibility, allowing them to monitor progress, review milestones, and understand where application resides within interconnection workflow

Recommendations



Status of Hosting Capacity

Current Hosting Capacity Tools

Tools publicly available on LUMA's website and updated periodically

- **Map types**
  1. Voltage level Maps – feeder voltage operations
  2. DER Penetration Maps – DER levels across feeders (updated monthly)
  3. Incremental Hosting Capacity Maps – field-verified feeders; expanded as verification progresses
- **DER Information Tool:** monthly updated transformer-level DER data and available capacity, rarely used by customers or developers due to unrestricted interconnection
- **Proactive Hosting Capacity Analysis:** to identify constraints, guide project siting, streamline queue screening, and support proactive grid investment planning

Hosting Capacity Tools

Proactive Planning for Additional DER Integration

Deploying Smart-Inverter Volt/VAR and Volt/Watt settings (IEEE 1547-2018) to slow voltage violations and increase interconnection headroom; submitted for Energy Bureau approval June 2025*

Implementing Smart-Inverter ride-through settings (voltage, frequency, disconnect/reconnect) to support grid stability during frequency events and transmission faults

Expanding Advanced Metering Infrastructure (AMI) to provide time-stamped load, generation, and voltage data for improved planning, DER siting, and identification of voltage issues

Separately consider customer technology programs, for example, non-export PV-plus-storage, aligning daytime PV output with evening peak demand, avoid voltage and thermal violations, manage frequency and system inertia

* LUMA's Revised Smart Inverter Sheets and Responses to Stakeholder Comments to LUMA's Comments of April 25, 2025 (Filed Jun 20, 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

LUMA

Integration of Smart Inverters Settings

- Low-cost, high-impact measures reduce voltage issues, curtailment, support reliability, and defer or optimize upgrades
    - Settings reduce high-voltage trips, support feeder hosting capacity growth, and enable more stable integration
- Modeling and field data show voltage violations and curtailment drop sharply once > 50% of adoption on individual feeder, high-voltage disconnects disappear. Curtailment close to zero at ~60% participation
- Settings developed using system data, simulations, stakeholder input, and IEEE 1547-2018 compliance
    - Volt/VAR as primary voltage-control mode; Volt/Watt as secondary “backstop” for persistent high-voltage conditions
    - Revised Enter-Service and Frequency Droop parameters aligned with SCADA data and ANSI/IEEE standards
- Enforceable adoption to post-2018 installs (already required to support IEEE 1547-2018), and targeted requirements on high-penetration feeders
- Standardized reporting via EPRI Common File Format for validation

LUMA Recommendations
JR 5-2026 Topics

Identified Gaps for Proactive Hosting Capacity

Gaps

- Incomplete asset and connectivity data
- Limited visibility on load and DER data
- Analytical engine lacks full integration limits end-to end analysis capabilities
- No automated/public Hosting Capacity Analysis publication or Application Programming Interface causing limited transparency and external accessibility

Reason

- Automatic interconnection removes controls
- Hosting Capacity Analysis is unused
- Cost allocation does not function
- High effort, low operational value

LUMA

Proactive Hosting Capacity Planning and Budgeting

Gap

- Current interconnection rules allow projects without thresholds and HCA cannot guide screening or decisions
- Key data missing or incomplete, i.e. GIS, load, metering, DERs added
- High cost with limited operational value
- Cannot support screening, cost allocation or proactive capital planning

Existing Tools

- Feeder voltage-class maps
- Monthly updated DER penetration maps
- Incremental hosting capacity where field data exists
- DER Information Web Tool with transformer-level visibility
- Meet transparency needs, though not fully automated

Practical Alternative

- Consolidate existing tools into simple feeder/transformer capacity indicator
- Gradually incorporate minimum daytime load, voltage fluctuation trends or reverse power flow data
- Aligns with current regulatory framework and minimizes cost
- Builds foundation for future data-driven planning and cost recovery

LUMA

Meter Socket Adapters (MSAs)

Proposals aligns with some utility requirements; priority is coordination and utility authority to inspect/remove MSAs if they affect meter performance
Benefits of MSAs acknowledged, but key utility standards, safety, and customer-experience are required
Installations must meet utility standards, ensure customer/technician safety, and maintain full meter functionality (reading, communication, remote connect/disconnect). Specific to installs in services 120/240 V, meters forms 1S or 2S
Responsibilities for installation, equipment faults, and inspections must be clearly defined
Processes must include LUMA for certification/authorization/notification of installations, for example installation of specialized lock rings
Requires additional deployment of LUMA meter technicians. Increase in resources means added funding requirements to avoid subsidization by ratepayers

Daytime Minimum Load

Minimum daytime load constraints on feeders with high PV penetration

- In middle of the day, electricity demand can drop very low. Solar systems may produce more energy than the grid needs causes voltage on the lines to rise

Smart Inverter settings help alleviate voltage concerns

- Volt-VAR
- Volt-Watt
- Ride- through capabilities
- Fixed or adjustable power factor

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Daytime Minimum Load

Increased integration of DERs impact utility scale generation dispatch, especially during low demand during the day

Obligations for unit dispatch associated with current PPOAs for fuel and generation capacity. Power plants must reduce their output, even though there may be contractual and technical requirements that limit how much and how fast they can ramp down

Locations of utility scale base units under PPOAs, may imply changes in security constrained economic dispatch (SCED) and require adjustments to keep grid stable

Need for rapid startup and response units during afternoon, which increases ramp up requirements by 700 to 1,100 MW in less than 5 hours

LUMA

Recommendations

Immediate Adjustments to Smart Inverters

- Require Volt-VAR enabled with LUMA-approved standard curve
- Enable Volt-Watt
- Set a fixed power factor, for example 0.98 absorbing, during hours with elevated-voltage risk
- Require standard configurations that do not depend on remote communications (quick implementation)

Impact: Lowers voltage during minimum-load hours without major infrastructure work

Temporary Export Limits (“Export Caps”)

- For critical feeders with very low load, impose export limits during certain hours
- Applicable to commercial systems ≥100 kW
- Can be implemented immediately through inverter settings

Impact: Prevent overvoltage and improve reliability

Customer Compensation for Curtailment

Sandia National Lab finding that with > 50% smart inverter setting adoption on individual feeder, high-voltage disconnects disappear. Curtailment close to zero at ~60% participation

Net Energy Metering was designed for self consumption. Some systems larger than customer needs, i.e. are designed to send excess energy to the grid. The system acts more like a commercial generator, not a typical net energy metering customer

Existing utility scale contracts, Power Purchase and Operating Agreements (PPOA), include capacity payments and and required minimum generation levels. Economic losses and operational challenges appear during daytime

LUMA

Customer Compensation for Curtailment

Recommendations

Compensation is unnecessary when controls are effective. If smart-inverter settings are widely adopted, curtailment becomes extremely rare and compensation is generally not necessary

Priority is to approve Smart Inverter Settings as presented by LUMA


People First.
Safety Always.
LUMA