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

IN RE: PERFORMANCE TARGETS FOR LUMA ENERGY SERVCO, LLC	**CASE NO.:** NEPR-AP-2020-0025 **SUBJECT:** MOTION TO SUBMIT EXPERT TESTIMONY

MOTION TO SUBMIT EXPERT TESTIMONY

TO THE PUERTO RICO ENERGY BUREAU:

COME NOW, Comité Diálogo Ambiental, Inc., El Puente de Williamsburg, Inc. - Enlace Latino de Acción Climática, Inc., Alianza Comunitaria Ambientalista del Sureste, Inc., Coalición de Organizaciones Anti-Incineración, Inc., Amigos del Río Guaynabo, Inc., CAMBIO, and Sierra Club and its Puerto Rico chapter, and Unión de Trabajadores de la Industria Eléctrica y Riego (collectively, "LECO"), by and through their legal counsel, respectfully set forth and pray:

1. Submission of this motion with one expert testimony of:

   A. Agustín Irizarry-Rivera, *Professor at the University of Puerto Rico Mayagüez Campus (UPRM).*

WHEREFORE, it is respectfully requested from the Energy Bureau to receive the testimony submitted in accordance with the applicable timetable.

RESPECTFULLY SUBMITTED, on this 22nd day of March 2022.

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CERTIFICATION OF SERVICE

I hereby certify that on March 22nd, 2022, I caused this Motion to Submit Expert Testimony to be served upon the following parties:

- Puerto Rico Energy Bureau: secretaria@energia.pr.gov; secretaria@jrsp.pr.gov; legal@jrsp.pr.gov and atorres@jrsp.pr.gov

- LUMA Energy LLC and LUMA Energy ServCo LLC: mmercado@mercado-echegaray-law.com; margarita.mercado@us.dlapiper.com; yahaira.delarosa@us.dlapiper.com; and ana.rodriguezrivera@us.dlapiper.com

- PREPA: jmarrero@diazvaz.law; kbolanos@diazvaz.law

- Oficina Independiente de Protección al Consumidor (OIPC): contratistas@oipc.pr.gov; hrivera@oipc.pr.gov

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

IN RE: PERFORMANCE TARGETS FOR LUMA ENERGY SERVCO, LLC	**CASE NO.: NEPR-AP-2020-0025** **EXPERT TESTIMONY OF AGUSTÍN A. IRIZARRY-RIVERA ON ADDITIONAL PERFORMANCE TARGETS**

<u>EXPERT TESTIMONY OF AGUSTÍN A. IRIZARRY-RIVERA ON
ADDITIONAL PERFORMANCE TARGETS
ON BEHALF OF LOCAL ENVIRONMENTAL AND CIVIL
ORGANIZATIONS</u>

Comité Diálogo Ambiental, Inc., El Puente de Williamsburg, Inc. - Enlace Latino de Acción Climática, Inc., Alianza Comunitaria Ambientalista del Sureste, Inc., Coalición de Organizaciones Anti-Incineración, Inc., Amigos del Río Guaynabo, Inc., CAMBIO, and Sierra Club and its Puerto Rico chapter, and Unión de Trabajadores de la Industria Eléctrica y Riego (collectively, "LECO"), hereby submits testimony from expert witness Agustín A. Irizarry-Rivera on the Additional Performance Targets set forth by the Puerto Rico Energy Bureau ("PREB") in its December 22, 2021 Order.

MARCH 22, 2022

1   ## I.   Background and Qualifications

2

3   **Q: Please state your name, position, and business address.**

4   **A:** My name is Agustín Alexi Irizarry-Rivera. I am a Professor in the

5   Electrical and Computer Engineering (ECE) Department at the

6   University of Puerto Rico Mayagüez Campus (UPRM, for its Spanish

7   acronyms). My business address is Road 348, km. 9.9, Poblado Rosario,

8   San Germán, Puerto Rico, 00683.

9

10   **Q: On whose behalf are you testifying in this proceeding?**

11   **A:** I am testifying on behalf of the following organizations: Comité

12   Diálogo Ambiental, Inc., El Puente de Williamsburg, Inc. - Enlace Latino

13   de Acción Climática, Inc., Alianza Comunitaria Ambientalista del

14   Sureste, Inc., Coalición de Organizaciones Anti-Incineración, Inc.,

15   Amigos del Río Guaynabo, Inc., CAMBIO, and Sierra Club and its

16   Puerto   Rico   chapter,   and   Unión   de Trabajadores de

17   la Industria Eléctrica y Riego (collectively, "LECO").

18

19   **Q: What is the purpose of your testimony?**

20   **A:** I have been asked to assess the three additional categories of metrics

21   that the Puerto Rico Energy Bureau ("PREB" or "Energy Bureau") has

22   set forth in this proceeding: interconnection of distributed solar &

23   storage, energy efficiency & demand response, and vegetation

24   management.

25

26

1 **Q: Do PREB's additional metrics fit the criteria of Law 17-2019 and**

2 **Regulation 9137 on metrics?**

3

4 **A:** Yes. The three additional categories of metrics that the PREB has set

5 forth are well tailored to encourage the necessary transformation to a

6 21st century electric grid. Interconnection of distributed renewables will

7 increase resiliency and empower customers. Energy efficiency and

8 demand response will lower customer bills while also increasing

9 resiliency and reliability, by easing the strain on the grid, especially at

10 peak times. And finally, vegetation management, as noted by filings by

11 both PREB and LUMA, will have numerous complementary effects that

12 improve reliability and public safety. LUMA's proposed metrics, on the

13 other hand would only achieve a 20th century system. LUMA's

14 testimony acknowledges this limitation, and LUMA's responses to

15 discovery state that "it is not possible to provide a timeline" even for that

16 limited goal.[1]

17

18 **Q: What general principles should PREB follow in applying penalties**

19 **and incentives for metrics in these three areas?**

20 **A:** We must always remember that for these three areas, as for all areas

21 where a performance incentive is considered, the performance rewards

22 and incentives shall be awarded *only after confirmation that*

23 *performance of an entity*, LUMA in this case, *is above and beyond the*

24 *benchmark*. Rewarding LUMA for achieving required compliance, or for

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[1] RFI-LUMA-AP-2020-0025-LECO-R5-10MAR22-019. A true and accurate copy is
attached as Exhibit 1.

performance comparable to PREPA's baseline performance in FY2020, is the antithesis of the performance base mechanism concept and contrary to the public interest. We must also remember the importance to apply penalties when the performance of an entity, LUMA in this case, falls short of achieving the compliance benchmark. Performance significantly below PREPA's baseline should warrant severe penalties, like reduction in LUMA's fixed fees, shortening its contract, or termination of the contract.

Q: What are the metrics that PREB should consider for interconnection of distributed renewables and storage?

A: In my original testimony, I set forth several metrics on the interconnection of distributed renewables and storage for the Energy Bureau's consideration:

- number of interconnections per year
- net metering installed capacity
- MWh of net metered electricity MWh sold back to utility
- number of net metered of customers
- renewable MW installed by type
- storage MW installed by type

PREB's May 2021 Order provides baselines for incremental MW of installed distributed generation capacity per year and incremental installed systems per year, by region.

PREB should set benchmarks based on rapidly interconnecting distributed resources to achieve the energy goals of the Puerto Rican people, including the Renewable Portfolio Standard.

1   **Q: Should LUMA earn an incentive merely for clearing the backlog of**

2   **interconnection requests?**

3   **A:** No. PREB must examine whether LUMA complied with the

4   expectation of successfully interconnect all backlogged applications to

5   interconnect with the electric grid. PREB must also determine whether

6   all of these backlogged interconnections were also successfully

7   incorporated into the net metering program.

8   Clearly if the expectation, and the promise from LUMA, was that all

9   backlogged cases were to be successfully interconnected and

10   incorporated into the net metering program within a specific time, then

11   clearing the backlog falls within compliance with the baseline. As such,

12   not only should LUMA not be rewarded for clearing the interconnection

13   backlog, LUMA should be penalized if it fails to achieve this. LUMA

14   should also be penalized if all of the backlogged interconnected were not

15   successfully incorporated into the net metering program.

16

17   **Q: If clearing the backlog is expected, when shall LUMA be rewarded?**

18   **A:** It should only be rewarded if its performance in this key area furthers

19   early compliance with public policy and if the reward encourages the

20   achievement of difficult tasks.

21

22   **Q: What is a difficult task in interconnection of distributed renewables?**

23   **A:** For example, interconnection to distribution lines at 13.2 kV is easier

24   than interconnection to distribution lines operating at 4.16 kV because

25   a 13.2 kV line will normally host more distributed capacity than a lower

26   voltage line. In keeping with PREB's requirement that incentives are

1 reserved for hard-to-achieve tasks, PREB should limit incentives to

2 LUMA's efforts to achieve a greater number of interconnections only in

3 distribution lines that operate at 4.16 kV, which are about half of all

4 distribution lines in the distribution system. Progress toward achieving

5 this hard-to-reach objective could also be awarded to LUMA if it converts

6 4.16 kV lines into 13.2 kV lines. Since lines supplying load at 13.2 kV

7 will experience lower electrical losses than a line operating at 4.16 kV.

8 LUMA may count this investment toward both goals: 1) improved

9 efficiency/decreased line losses and 2) increased distributed

10 interconnections, once these interconnections are confirmed.

11

12 **Q: What are the metrics that PREB should consider for energy**

13 **efficiency?**

14 **A:** In my direct testimony I set forth several metrics to measure LUMA's

15 performance:

16 • percent of customers signed up per year

17 • annual and lifecycle energy savings

18 • annual and lifecycle peak demand savings

19 • program costs per MWh saved

20 PREB should set baselines for these metrics, designed to achieve

21 PREB's goal of 30% energy efficiency by 2040, set in PREB Docket MI-

22 2021-0005. LUMA can earn an incentive by achieving 30% energy

23 efficiency faster than 2040. In addition, the 2020 energy efficiency

24 scorecard from the American Council for an Energy-Efficient Economy[2]

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[2] Attached to LECO's answer to PREB-LECO-01-25.

1   should be helpful to compare LUMA's performance to other utilities and

2   identify quick-start programs and easier steps that LUMA should be

3   required to take on energy efficiency.

4

5   **Q: Do you recommend any metrics for steps that LUMA can take to**

6   **improve energy efficiency on the grid side?**

7   **A:** Yes. For example: operating distribution lines within the allowed

8   deviation from nominal voltage, but within the low end of the voltage

9   deviation band, is a mechanism used by distribution utilities to reduce

10   line losses. Balancing of distribution lines phases is another mechanism

11   to reduce line losses.

12   If PREB's grid-side energy efficiency program is successful, we should

13   expect to see improvement in metrics such as:

14   • reduction of total electricity losses

15   • reduced technical losses as percentage of net generation.

16   I recommend a baseline level of system losses of 15%, based on the findings

17   of a study conducted under my supervision.[3] I note that this metric should

18   exclude energy lost due to theft and energy lost due to bad metering.

19   For a benchmark, I recommend the average Transmission & Distribution

20   system loss for a mainland utility, of about 5%.[4]

21   PREB's discovery question, PREB-LECO-01-27, correctly notes that energy

22   efficiency measures and demand response measures would also help to

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[3] Jennifer Jiménez's electrical engineering master thesis: Jennifer Jiménez, *"Benefits of Electric Generation Displacement Using Solar Thermal Water Heating"*, MS Thesis, University of Puerto Rico-Mayagüez, Mayagüez, Puerto Rico, (2005).

[4] *See* U.S. Energy Information Admin., *How much electricity is lost in electricity transmission and distribution in the United States?* (Last updated Nov. 4, 2021) https://www.eia.gov/tools/faqs/faq.php?id=105&t=3.

1   lower system losses. I see this as all the more reason to induce LUMA to

2   take those measures, through penalties and incentives tied to reduction of

3   system losses.

4   **Q: How could PREB ensure that LUMA's energy efficiency measures**

5   **include benefits to low- and moderate-income customers?**

6   **A:** As detailed in my direct testimony, I recommend a performance

7   Incentive Mechanism tailored to these customers, modeled after the

8   mechanism set by the Hawaii PUC, to promote the utilities collaboration

9   with Hawaii Energy to deliver savings for LMI customers.

10   That mechanism included three metrics:

11   - Metric 1 is "Energy Savings": Residential Hard-to-Reach

12   ("RHTR") Energy (kWh) Savings Beyond Hawaii Energy's Target.

13   The metric is based on "verified kWh energy savings, and any

14   Commission-approved and verified energy savings for LMI

15   customers resulting from advanced rate design and any future co-

16   deployed Hawaii Energy and Hawaiian Electric energy efficiency

17   programs." The threshold to qualify for an incentive is "100% of

18   Hawaii Energy's kWh target energy savings as set forth in its

19   Commission-approved annual plan for RHTR programs." thus the

20   "hard to reach" label on the metric name.

21   - Metric 2 is "Peak Demand Reduction": Residential Hard to Reach

22   Peak Demand (kW) Reduction Beyond Hawaii Energy's Target.

23   The metric is based on "verified peak demand reduction, and any

24   Commission-approved and verified energy savings for LMI

25   customers resulting from advanced rate design and any future co-

26   deployed Hawaii Energy and Hawaiian Electric energy efficiency

1   programs." And again, the threshold to qualify for an incentive is

2   "100% of Hawaii Energy's kW target peak demand reduction as

3   set forth in its Commission-approved annual plan for RHTR

4   programs." thus the "hard to reach" label on the metric name.

5   • Metric 3 is "Program Participation": A&A Customers   Served

6   Beyond Hawaii Energy's Target. The metric is based on "The sum

7   of program participants each year ("customers served") in Hawaii

8   Energy Residential A&A, and any Commission-approved and

9   verified energy savings for LMI customers resulting from

10   advanced rate design and any future co-deployed Hawaii Energy

11   and Hawaiian Electric energy efficiency programs." And again,

12   the threshold to qualify for an incentive is "100% of Hawaii

13   Energy's kW target peak demand reduction as set forth in its

14   Commission-approved annual plan for RHTR programs." thus the

15   "hard to reach" label on the metric name.

16   The total reward for the PIM is capped at $2 million, annually, across

17   all three metrics combined and is set to be "comprehensibly revisited"

18   after three years.

19   The "hard to reach" label aligns with PREB's directive that "Targets of

20   Levels for which an incentive may be proposed, shall be tied to difficult

21   tasks, and not easy to fix areas." LUMA has not adequately evaluated

22   whether its proposed incentives are tied to difficult tasks, or easy to fix

23   areas.

24

25

26

1   **Q: What are the metrics that PREB should consider for demand**

2   **response?**

3   **A:** My direct testimony set forth several metrics to measure LUMA's

4   performance:

5   • percent of customers signed up per year

6   • percent of customers enrolled

7   • MWh of DR provided over past year

8   • potential and actual peak demand savings

9   • number of customers on time-varying rates

10

11   **Q: What are the metrics that PREB should consider for vegetation**

12   **management?**

13   **A:** As many of PREB's discovery questions and LUMA's testimonies

14   make clear, vegetation management is critically important for

15   reliability, resiliency, and public safety. "Excess vegetation could lead

16   to outages, impacting other performance metrics like SAIDI and

17   SAIDI."[5] PREB can set some metrics on LUMA's overall progress:

18   • percent electric line miles annually subjected to tree trimming

19   • total annual planned trim miles

20   • annual trim acreage achieved

21   • widening miles for FY 2022, 2023, and 2024

22   • monthly outages caused by vegetation

23   PREB's Sixth Requirement of Information to LUMA Questions 1, and 8-

24   14 required information from LUMA on its plans to address these

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[5] Rebuttal Testimony of Kalen Kostyk, p. 9.

1   metrics. LUMA should be required to respond fully, and those responses

2   should be used to set baselines and benchmarks for metrics on

3   vegetation management. If LUMA does not achieve these baselines,

4   LUMA should be penalized. If LUMA only achieves the compliance

5   baseline, or exceeds it without achieving hard to reach vegetation

6   management targets, then it should not be penalized nor rewarded.

7   LUMA should only be rewarded if its performance in the vegetation

8   management area is one that achieves a hard-to-reach target. PREB

9   should avoid setting a compliance benchmark, and even more so a target

10   that offers an incentive, that is a global percentage based on all lines.

11

12   **Q: Why should LUMA's incentives on vegetation management be**

13   **limited in this way?**

14   **A:** Because tree trimming of lines adjacent to roads and highways is easy

15   as these lines are easy to reach than lines that cross mountainous

16   regions.

17   **Rewards or incentives should be restricted to achieving a hard-to-reach**

18   **percentage of line miles maintained in the difficult to access distribution**

19   **and transmission lines, in keeping with PREB's statement that only**

20   **hard-to-achieve steps should be rewarded. Also, failure to do**

21   **maintenance on most of the line miles adjacent to roads or highways**

22   **must be penalized.**

23   PREB should also require LUMA to identify the relative difficulty for

24   vegetation maintenance for each line, or each region.

25

26

1   **Q: Do you also recommend that PREB set metrics on customers' access**

2   **to information?**

3   **A:** Yes, because a critical aspect of energy efficiency and demand

4   response is giving customers more information about their energy use.

5   Customers with granular info about energy use are more able to identify

6   energy inefficiencies and times where they can take advantage of

7   demand response. I suggest metrics to measure LUMA's efforts to

8   provide customers with access to data:

9   • number of customers able to access daily and hourly usage data

10   • percent of customers with access to hourly or sub-hourly usage

11   data

12

13   **Q: Please summarize your recommendations.**

14   **A:** My recommendations are:

15

16   <u>Recommendation 1:</u> Successful interconnection and incorporation into

17   the net metering program of all backlogged cases (applications to

18   interconnect distributed generation) within a specific time falls within

19   compliance with a baseline. Therefore LUMA should be penalized if it

20   fails to achieve this and not rewarded for achieving it. Furthermore,

21   LUMA should also be penalized if all of the backlogged interconnections

22   were not successfully incorporated into the net metering program.

23

24   <u>Recommendation 2:</u> PREB should limit incentives to LUMA's efforts to

25   achieve a greater number of interconnections only in distribution lines

26   that operate at 4.16 kV. Progress toward achieving this hard-to-reach

1   objective could also be awarded to LUMA if it converts 4.16 kV lines into

2   13.2 kV lines.

3

4   Recommendation 3: PREB should mandate grid-side metrics to improve

5   energy efficiency at the electric grid level. For example: operating

6   distribution lines within the allowed deviation from nominal voltage,

7   but within the low end of the voltage deviation band, is a mechanism

8   used by distribution utilities to reduce line losses. Balancing of

9   distribution lines phases is another mechanism to reduce line losses.

10

11   Recommendation 4: LUMA should only be rewarded if its performance

12   in the vegetation management area is one that achieves a hard-to-reach

13   target. PREB should avoid setting a compliance benchmark, and even

14   more so a target that offers an incentive, that is a global percentage

15   based on all lines because tree trimming of lines adjacent to roads and

16   highways is easy as these lines are easy to reach than lines that cross

17   mountainous regions.

18

19   Recommendation 5: In vegetation management, rewards or incentives

20   should be restricted to achieving a hard to reach percentage of line miles

21   maintained in the difficult-to-access distribution and transmission lines,

22   in keeping with PREB's statement that only hard-to-achieve steps

23   should be rewarded. Also, failure to do maintenance on most of the line

24   miles adjacent to roads or highways must be penalized.

25

26   Recommendation 6: PREB should also require LUMA to identify the

1   relative difficulty for vegetation maintenance for each line, or each

2   region.

3

4   **Q: Does this conclude your testimony?**

5   **A:** Yes, it does. However, I retain the right to modify or clarify my views

6   based on new information made available to me.

7

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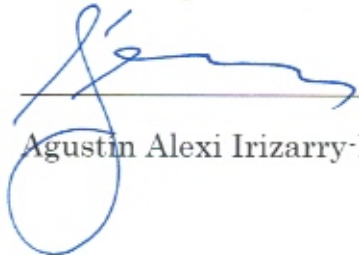
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CERTIFICATION

I Agustín Alexi Irizarry-Rivera, of legal age, married, engineer and resident of San Germán, Puerto Rico, CERTIFY that the contents of my testimony are known to me and are the truth according to the best of my abilities and reasonable knowledge. The technical and operational aspects included in the testimony are based on information that has been gathered in good faith; but I cannot guarantee the truthfulness of information gathered from third parties.

_____

Agustín Alexi Irizarry-Rivera, Ph.D., P.E.

Before me, the undersigned Notary Public, personally appeared Agustín Alexi Irizarry-Rivera, who acknowledges that the above is true this day of March 22, 2022 ~~November 22, 2021~~ in Cabo Rojo, Puerto Rico.

[   ] Personally known OR [✗] Identification Document provided

Driver's License 1726351.

Affidavit# 8031 _____

_____

Notary Public Name, Signature, Seal

Exhibit 1

Performance Metrics
Docket ID: NEPR-AP-2020-0025

Information Response Round 5: LECO Request 5

REFERENCE: RFI-LUMA-AP-2020-0025-LECO-R5-10MAR22-019

REQUEST:

On pp. 6-7 of your testimony, you state that Puerto Rico's T&D system requires "significant investment to get to the point of a 20th century system…." How long do you believe it will take LUMA to get Puerto Rico's T&D system "to the point of a 20th century system?

RESPONDER:

Don Cortez

RESPONSE:

At this time, it is not possible to provide a timeline, and consideration of such a timeline is beyond the scope of this proceeding. The length of time depends on the amount of funds required, availability of resources and equipment, and sequencing of investments. Some elements that are needed in the Puerto Rico T&D System, include a new Energy Management System (EMS), automated switches that require resilient poles that meet the current design standards; and AMI, which requires expanded telecommunications from the substation into the grid. Please refer to lines 676 through 686 of my rebuttal testimony, where I mention several of LUMA's SRP programs to harden the grid, which includes program funding requirements and estimated timelines and milestones.