

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

NEPR

Received:

Oct 23, 2019

5:13 PM

IN RE: REVIEW OF THE PUERTO RICO  
ELECTRIC POWER AUTHORITY  
INTEGRATED RESOURCE PLAN

CASE NO.: CEPR-AP-2018-0001

SUBJECT: Intervenor's Written Testimony

**MOTION TO SUBMIT INTERVENOR'S WRITTEN TESTIMONY**

TO THE HONORABLE ENERGY BUREAU:

COMES NOW, the Puerto Rico Solar Energy Industries Association Corp. dba Solar & Energy Storage Association of Puerto Rico ("SESA-PR"), through the undersigned legal counsel, and very respectfully states as follows:

1. In accordance with the Procedural Calendar set forth in the October 16, 2019 Resolution and Order issued by the Puerto Rico Energy Bureau in these proceedings, SESA-PR is hereby submitting the attached written testimony of Patrick J. Wilson, President of SESA-PR.

WHEREFORE, SESA-PR respectfully requests the Puerto Rico Energy Bureau to take notice of the foregoing and accept the attached written testimony.

I HEREBY CERTIFY that a copy of this document has been notified on this date via email to the following:

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RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 23th day of October, 2019.

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**Direct Testimony of Patrick J (PJ) Wilson  
President  
Solar & Energy Storage Association  
of Puerto Rico**

**October 23, 2019**

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1     **I.       INTRODUCTION**

2

3     **A.       Witness Identification**

4

5     Q.       Please state your name, title, employer, and business address.

6     A.       My name is Patrick J (PJ) Wilson. I am the founder and President of the Solar  
7     and Energy Storage Association of Puerto Rico ("SESA-PR") My business address is  
8     1357 Ave Ashford #171, San Juan, Puerto Rico 00907.

9

10    Q.       On whose behalf are you testifying before the Puerto Rico Energy  
11    Bureau (the "Energy Bureau") (formerly known as the Puerto Rico Energy  
12    Commission) in this proceeding?

13    A.       I am testifying on behalf of SESA-PR.

14

15    Q.       Have you previously testified or made presentations before the Energy  
16    Bureau?

17    A.       I have testified in person and/or submitted written comments on multiple  
18    rulemaking and workshop proceedings before the Energy Bureau, including the  
19    dockets on Wheeling, Interconnection, Renewable Energy Credits, Performance  
20    Incentive Mechanisms, Energy Efficiency and Distributed Generation, and the  
21    Integrated Resource Planning (IRP) Rule. I have also participated and given input at  
22    all workshops hosted by the Energy Bureau pertaining to solar energy since 2018,

23 as well as before the Senate of Puerto Rico. This will be my first sworn testimony  
24 offered to the Energy Bureau in a formal proceeding as an Expert Witness.

25

26 **B. Summary of Direct Testimony**

27

28 **Q. What are the purposes and subjects of your Direct Testimony?**

29 A. My Direct Testimony addresses the following purposes and subjects:

30 1) I recommend changes to the IRP regarding projections its absence of  
31 projected electric demand increases due to electric vehicles;

32 2) I recommend changes to the IRP regarding projected demand  
33 reductions due to energy efficiency;

34 3) I recommend changes to the IRP regarding some of the assumptions  
35 relating to projections of costs and capacities for solar and storage; and

36 4) I recommend resulting changes to some of the conclusions of the IRP,  
37 including to the recommended Action Plan.

38

39 **Q. In brief, what are your conclusions and recommendations?**

40 A. The IRP was developed at a time when Puerto Rico lacked strong public  
41 policy regarding energy efficiency and renewable energy. After the first iteration of  
42 the IRP was put forth in January 2019 and rejected by the Energy Bureau the  
43 following month, and before the re-filing of the IRP, Puerto Rico created what is now  
44 known as Law 17 (2019), the "Puerto Rico Energy Public Policy Act".

45           My overarching conclusion is that sufficient time and resources were not  
46   invested in the June 2019 version of the IRP that was filed and is before the Energy  
47   Bureau today regarding integration of the new requirements and guidelines created  
48   by Law 17. As a result, the IRP as presented does not reflect an adequate level of  
49   analysis and therefore does not make accurate projections of or conclusions about  
50   issues pertaining to the growth of solar generation and energy storage.

51

52   Q.     Are there any exhibits attached to your testimony?

53   A.     No, my testimony does not include exhibits.

54

55   **C.     Qualifications and Professional Background**

56

57   **Q.     What is your educational background?**

58   A.     I received a Bachelors degree in Civil Engineering and a minor in Business  
59   Administration from the University of Southern California, in Los Angeles,  
60   California, in 2001. I later took coursework towards a Masters of Business  
61   Administration from the Bainbridge Graduate Institute, in Seattle, Washington, in  
62   2008 & 2009.

63

64   **Q.     What is your professional experience?**

65   A.     I have over 13 years of professional experience in the promotion of  
66   widespread adoption of solar, wind, and other types of renewable energy  
67   technologies, as well as energy efficiency. I have managed dozens of public policy



68 campaigns in the promotion of expansion of clean energy technologies, and founded  
69 six nonprofit organizations. I also served on the board of directors of two nonprofit  
70 organizations. All organizations I have founded and/or managed have been focused  
71 on the expansion of renewable energy and/or energy efficiency. I am currently the  
72 President of SESA-PR.

73

74 **Q. Have you previously testified or made presentations before other**  
75 **energy regulators or policy venues?**

76 A. I have testified regularly, dozens of times between 2007 and 2017, at policy  
77 proceedings in my home state of Missouri. I have submitted written and / or verbal  
78 testimony to the Missouri House, Senate, Public Service Commission, and  
79 Department of Natural Resources in a variety of workshops, informal and formal  
80 rulemakings, formal complaints, proposed tariffs, and pending legislative changes. I  
81 have overseen intervention in contested rate cases and litigation, including before  
82 the Missouri Supreme Court, and I also served as an Expert Witness for a case  
83 regarding the cost impacts of Missouri's Renewable Energy Standard.

84 All of my testimony and interventions have been in support of the expansion  
85 of energy efficiency and/or renewable energy.

86

87 **Q. How long have you been the President of SESA-PR?**

88 A. I was the sole incorporator of SESA-PR in February 2018, and became its  
89 founding President in April 2018.

90

91 **Q. Do you hold any professional licenses?**

92 A. I have passed the Engineer-In-Training exam in the state of California.

93

94

95 **II. ANALYSIS OF PREPA's IRP**

96

97 **A. General Description of Relevant Provisions**

98 Q. Please describe a general description of the topics covered in your testimony.

99 A. The general topics included in this testimony include:

100

101 - Electric Vehicle adoption projections should be included.

102 - Energy Efficiency projections are much too aggressive.

103 - Solar Energy adoptions rates are too low.

104 - Distributed Generation & Storage analysis is not sophisticated enough.

105 - The resulting projections for demand are too low, which coupled with

106 other factors, result in too low of a projection of solar and storage overall,

107 and distributed solar and storage in particular.

108 - Recommended changes to the IRP.

109

110 **B. Impact of Electric Vehicles**

111

112 Q. What does the IRP forecast as the impact of Electric Vehicles (EVs) on peak

113 demand and on load growth?

114 A. The IRP makes no mention of increased electric sales or consumption over  
115 the course of the following 20 years due to consumers switching from internal  
116 combustion powered vehicles to electric vehicles, and therefore projects no demand  
117 increase due to electric vehicles.

118 In response to a Discovery question on this topic (PREB- 01- 18- g), Marcelo  
119 Saenz replied:

120 *"Electric Vehicle (EV) demand was not factored in the load forecast. However,*  
121 *Siemens developed a high-level estimate to assess the potential impact of EV on peak*  
122 *demand. Siemens estimated potential levels of adoption based on total light duty*  
123 *vehicles registered in Puerto Rico in different paths of forecast penetration nationwide*  
124 *and for selected states in the U.S. Siemens included nationwide cases, particularly*  
125 *Hawaii, California and West Virginia. As a result, the analysis shows that the potential*  
126 *impact on peak demand is in the order of 20 to 57 MW by 2038."* (Underlining ours.)

127 Given that this statement is true, this would mean that the IRP takes no  
128 consideration of the electric vehicles and electric vehicle charging stations (both  
129 public and private) that have emerged on the island in recent years, nor the electric  
130 vehicles and accompanying charging stations that are currently operating, and also  
131 makes the assumption that there will be no electric vehicles or operating charging  
132 stations for the next 20 years.

133 Although I don't consider myself to be an expert on electric vehicles per se, I  
134 have personally witnessed multiple electric vehicles and charging stations operating  
135 on the island, so I know that the assumption of no existing load due to electric  
136 vehicles is incorrect. I have also read numerous studies projecting future load

growth of electric vehicles, and also read announcements from every major auto manufacturer in existence today of their intention to ramp up production of electric vehicle plug-in hybrids and/or pure electric vehicles.

Q. What does the IRP cite as a basis for its forecasting of impacts on peak demand and load growth due to Electric Vehicles?

A. The IRP gives no reference to the analysis, or lack thereof, given to electric vehicles. The discovery answer referenced above states that Siemens considered some data from "Hawaii, California and West Virginia", but there is no citation of which specific data was used to draw the conclusions that there will not be any load growth at all due to electric vehicles, or that peak demand will increase by "in the order of 20 to 57 MW by 2038".

Q. What factors should be taken into consideration in the IRP regarding the growth of Electric Vehicles?

A. This IRP should take into consideration conclusions drawn from demand curve predictions made elsewhere on this this topic, and draw reasonable assumptions about the likely impact of load growth due to EV adoption in Puerto Rico based on tailored data such as the number of vehicles per capita, the annual miles driven, and the miles driven per region of the island.

Q. Are there any formal studies that should be referenced in the prediction of load growth and peak demand impact due to Electric Vehicles?

A. There are many formal studies that have been published on this topic. To more accurately predict future demand on the island, a survey would need to be conducted of existing studies, a selection made of which are most applicable to Puerto Rico, and resulting conclusions drawn and integrated into the demand forecast.

One such study that was referenced by the Rocky Mountain Institute as part of their Amicus brief filed in this proceeding is "Hawaii Transportation by the Numbers," 2017, <https://www.bts.dot.gov/sites/bts.dot.gov/files/legacy/Hawaii.pdf>. Drawing upon data from this study and others, Rocky Mountain Institute states in its Amicus: "We conclude that at EV adoption levels of 15%, 30%, and 50%, the increase in PREPA sales would be 10%, 20%, and 33%, respectively, as shown in figure 5 below. This analysis assumes a 2038 Puerto Rico population of 2.4 million and assumes driving behavior is comparable to that reported for Hawaii, i.e., that there are 0.93 vehicles per capita and that 8,231 miles are driven annually per vehicle."

### **C. Energy Efficiency Projections**

Q. What load impacts does the IRP project based on the adoption of energy efficiency measures?

A. The IRP forecasts a reduction of load due to energy efficiency program offerings of 2% starting in 2019, rising to 12% in 2025, and ultimately 35% by 2038.

183 Q. What basis does the IRP use for its projections of energy efficiency savings?

184 A. The IRP cites the requirements of Law 17 and an order from the Bureau to  
185 include energy efficiency in this IRP.

186

187 Q. Are the basis for their projections reasonable?

188 A. No. The requirement of Law 17 is a reduction in electric consumption of  
189 30% by 2040. PREPA is currently administering no energy efficiency programs for  
190 its customers, and has little to no experience doing so in the past. The Bureau has  
191 published a draft rule on Energy Efficiency, and it includes a requirement that a  
192 Third Party Administrator be selected – by the Bureau – to manage all future Energy  
193 Efficiency and Demand Response programs.

194 This draft rule does not establish interim requirements of 2% per year  
195 starting in 2019, but rather references the requirement in Law 17 of a savings of  
196 30% by 2040, and asks bidders wishing to become the Third Party Administrator to  
197 propose their own goals that they anticipate as being realistic. I anticipate that,  
198 given the time needed to begin and ramp up efficiency programs generally and  
199 coupling those factors with the unique situation in Puerto Rico, the time to begin  
200 offering efficiency programs will be significantly longer than in another otherwise  
201 comparable jurisdiction with little to no energy efficiency experience, and that the  
202 ramp-up of customer participation and corresponding energy savings would be  
203 much slower as well.

204

205 Q. What should the IRP instead use as a basis in determining an accurate  
206 projection for energy efficiency savings?

207 A. The IRP should use as a minimum the energy efficiency savings requirements  
208 referenced in Law 17, which is to ramp up efficiency savings to total at least a 30%  
209 reduction in demand by 2040, and also pursue all cost effective energy efficiency.

210 The IRP should also take into consideration the factors that would contribute  
211 to a typical start-time and ramp-up period of efficiency programs in other  
212 jurisdictions that don't have the complicating factors such as the sole utility  
213 company in the jurisdiction being in a state of financial limbo due to bankruptcy, in a  
214 state of uncertainty given a pending effort to award to a private concessionaire the  
215 operation of the the transmission and distribution system, and the rules for energy  
216 efficiency requirements not having been completed and on an uncertain timeframe.  
217 Then, applying these complicating factors and any other potentially relevant  
218 complicating factors, the IRP should make more realistic assumptions about the  
219 pace of ramp-up of energy efficiency programs and resulting reductions in  
220 electricity consumption on the island.

221

222 Q. What timetable would be more realistic?

223 A. Given that no efficiency programs exist today or are anticipated to exist in  
224 2019, there will be no savings from efficiency programs for 2019. Also, there are a  
225 variety of factors that should be assumed to result in a significant delay in the  
226 beginning of the ramp-up period. Some of those factors are a) the industry standard  
227 practice of administering a detailed energy efficiency potential study before

designing and beginning to implement programs, b) the common practice of having a period of pilot programs before offering a full suite of efficiency offerings, and c) the assumption of delays due to the extenuating circumstances surrounding PREPA.

A more realistic timetable could then be:

2019: None.

2020: 0 or near-zero (as the potential study is underway).

2021-2022: Under 0.1% (as the potential study finishes and the Third-Party Administrator is chosen).

2023-2025: Savings near those projected by the potential study and Third-Party Administrator. Likely less than 0.5% per year.

2026 and beyond: A slower ramp-up period than would be anticipated in other otherwise similar jurisdictions, culminating in at least 30% reduction in energy sales by 2040.

Q. What would then be the resulting impact on demand projections in the Action Plan included in the IRP?

A. If the above projections are accepted, then the cumulative impact of efficiency measures through 2025 would be a demand reduction of 1.7%, instead of the 12% currently forecasted in the IRP.

#### **D. Solar Energy Projections**

Q. How much solar development does the IRP call for?



251 A. Projections vary by scenario, but examples are:

252 - S4S2 forecasts 2,220 MW by 2025 and 2,820 MW by 2038, and

253 - S3S2S8B forecasts 2,820 MW by 2025 and 4,140 MW by 2038

254

255 Q. What does the IRP state as a basis for the included projections?

256 A. The IRP states that it's using the minimum requirements of Law 17 as the

257 main basis of its projections.

258

259 Q. Are the basis for their projections reasonable?

260 A. No, for at least two reasons. First, there appears to be a misunderstanding

261 about what the basic minimum requirements are. While Law 17 actually requires

262 20% renewable energy by 2022, 40% by 2025, 60% by 2040 and 100% by 2050, the

263 IRP states that the requirements are instead:

264

265 "15% by 2021, 20% by 2022, and 40% by 2055".

266

267 Secondly, the over-optimistic efficiency projections and assumption of zero

268 load growth due to EVs should be adjusted accordingly to reduce the uncertainty of

269 overall load projections. In my view, if adjusted accordingly, projected load will be

270 significantly higher, corresponding to a significantly higher amount of solar and

271 storage of all scales to be included in the IRP.

272

Q. What should the IRP instead use as a basis in determining a more accurate projection of the amount and timing of solar energy adoption?

A. The IRP should account for the errors in load projection, and any other identified errors, and re-run the analysis.

#### **E. Distributed Solar & Storage Projections**

Q. What load impacts does the IRP project based on the adoption of solar energy?

A. All scenarios forecast an increase in distributed generation of 1,100 MW by 2038.

Q. Are their projections reasonable?

A. No. The projections are not sophisticated enough (as evidenced by the fact that the rate of customer adoption is the same in all scenarios), and don't adequately take into account current and future likely developments including:

- Congressionally approved CDBG-DR funding (\$400 million) for distributed generation;
- Law 17 requirement for the utility to purchase RECs from distributed generation customers;
- Likely cost reductions due to increased innovation;
- Likely aggregation of customer generation and storage with mutual benefits to the utility and the customer;

- Emerging financing options which are making distributed generation available to more income levels;
- The impact of Hurricane Maria in shifting the distributed market from a near zero inclusion of battery storage before 2017, to the vast majority of customers choosing to install storage with solar for resiliency reasons; and
- Opening of the utility market to new private companies which can promote solar and storage in innovative new ways.

Q. What should the IRP instead use as a basis in determining a more accurate projection of the amount and timing of solar energy adoption?

A. Distributed Generation should have a much more in-depth analysis done before finalization of this IRP, with the likely result being a large increase in its projected adoption.

#### **F. Resulting Incorrect Conclusions in the IRP as Presented**

Q. What is the result of the deficiencies impacting solar energy in this IRP?

A. Due to the forecast of no increase in demand due to electric vehicle adoption, coupled with the forecast of unrealistically high energy efficiency savings, the projected demand curve is unrealistically low.

318 Q. What is the impact on solar and storage due to the demand curve being  
319 unrealistically low?

320 A. Focusing on the first 5 years of the timeframe considered in the IRP, the  
321 impact projects a much lower total electric demand than if the efficiency, solar, and  
322 storage issues were more accurately accounted for.

323 Since the Renewable Energy Standard included in Law 17 (2019) requires  
324 that 20% of the electricity sold by PREPA or its successors be derived from  
325 renewable energy by 2022, and 40% by 2025, this results in the amount of solar and  
326 storage projected to be needed in order to meet these requirements to be much  
327 lower than they would be if these deficiencies in load projection were accounted for  
328 more accurately.

329 The projections of projected solar growth projected impact the ability of the  
330 industry to meet what will more likely be the true needs of the island. Companies  
331 that develop solar and energy storage projects need time to plan to ramp up  
332 operations to meet these requirements, and if the requirements as planned for are  
333 unrealistically low, then it will likely result in too few or too small of RFPs being  
334 issued for large-scale solar construction, and too small of incentives or programs to  
335 support the development of distributed generation.

336

337 Q. What would be the impacts of a failure to meet the requirements of the  
338 Renewable Portfolio Standard included in Law 17 (2019)?

339 A. There would be many impacts. First, Law 17 (2019) requires that a  
340 significant financial penalty be imposed on any utility that fails to meet the

percentages of required renewable energy production required in the law. The penalty to be imposed is required to be equal to two times the value of Renewable Energy Credits (RECs) representing the shortfall of renewable energy production required during the relevant year. For example, if in 2023 PREPA's annual compliance reports for the previous year shows that they only retired RECs equivalent to 8% of their electric sales instead of the required 20%, the financial penalty to be imposed would be two times the value of the RECs representing the shortfall, as measured in Megawatt-Hours, of electricity generated by nonrenewable sources instead of renewable sources.

The impact of such financial penalties would have to be borne by the ratepayers, which would make the already high electric bills paid by Puerto Rico residents be even higher.

A shortfall in one year could indicate a likely shortfall in future years as well, which could create a snowball effect of financial penalties assessed and corresponding higher rates to pay for those penalties. In the example above, if Puerto Rico were to reach only 8% of their energy from renewables in 2022 instead of the required 20%, it would make it significantly more challenging to reach the 40% requirement of 2025.

For these reasons, it is important that the demand curves and corresponding requirements for renewable energy production be as accurate as possible.

364           **G. Recommendations for Changes to the IRP**

365

366    Q.     What changes do you recommend be made to this IRP before it's certified as  
367    accepted by the Energy Bureau?

368    A.     Generally, the entire IRP under-analyzes and under-values solar and storage  
369    at all scales, while also violating the spirit of Law 17 by not having at its centerpiece  
370    the development of renewable energy and energy efficiency.

371           This testimony and others in favor of a deeper analysis and inclusion of  
372    efficiency and renewables should result in an order for a deeper analysis to occur  
373    focused on the development of these important technologies.

374

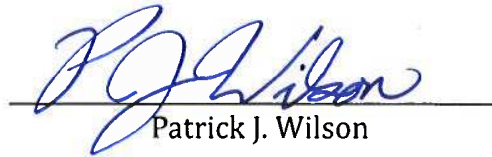
375    **III. CONCLUSION**

376    Q.     Does this complete your Direct Testimony?

377    A.     Yes.

## ATTESTATION

Affiant, Patrick J. Wilson, being first duly sworn, states the following: The prepared Pre-Filed Direct Testimony attached thereto constitutes the direct testimony of Affiant in the above-styled case. Affiant states that he would give the answers set forth in the Pre-Filed Direct Testimony if asked the questions propounded therein at the time of the filing. Affiant further states that, to the best of his knowledge, his statements are true and correct.

  
Patrick J. Wilson

Affidavit Number 135

Acknowledged and subscribed to before me by Patrick J. Wilson, of legal age, single, and resident of San Juan, Puerto Rico, in his capacity as President of SESA-PR and to me personally known, in San Juan, Puerto Rico, on October 23, 2019.



  
Notary Public