

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

**NEPR**

**Received:**

**Sep 8, 2025**

**5:54 PM**

**IN RE: PUERTO RICO  
ELECTRIC POWER  
AUTHORITY RATE REVIEW**

**CASE NUM. NEPR-AP-2023-0003**

**Rate Review Proceeding**

**Direct Testimony of Ahmad Faruqui  
September 8, 2025**

**Summary of Prepared Direct Testimony of  
Ahmad Faruqui  
ON BEHALF OF  
SOLAR UNITED NEIGHBORS**

Dr. Ahmad Faruqui submits this Direct Testimony on behalf of Solar United Neighbors. He has advised some 150 clients in 12 countries on 5 continents on matters related to the efficient use of electricity, including the price of electricity. Dr. Faruqui has testified or appeared before regulators, legislative bodies and government agencies multiple times in several states within the US and abroad. His experience and qualifications are included as EXHIBIT to this testimony.

Dr. Faruqui submits that Puerto Rico should not change any of the elements of its current net metering policies (NEM). He suggests moving toward time-of-use (TOU) rates to ensure that solar customers will lower their peak load by moving it to off-peak periods. He also submits that ending NEM will dramatically slow down the adoption of solar panels and batteries, further increasing the energy burden for most Puerto Ricans.

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1 I. INTRODUCTION

2 A. Witness identification

3 Q.1 What is your name and location?

4 A. Ahmad Faruqui. I am based in the San Francisco Bay Area.

5 Q.2 On whose behalf are you testifying before the Puerto Rico Energy Bureau?

6 A. My testimony is on behalf of Solar United Neighbors.

7 B. Qualifications and Professional Background

8 Q.3 What are your professional qualifications?

9 A. I began working as an energy economist in 1978 at the California Energy Commission.

10 Subsequently, I worked at a wide range of organizations, including the Electric Power

11 Research Institute, and several consulting firms, the last one of which was The Brattle

12 Group, from where I retired at the end of 2021. I am now an independent consultant.

13 I have advised some 150 clients in 12 countries on 5 continents on matters related to the

14 efficient use of electricity, including the pricing of electricity. My clients have been state

15 and federal commissions, electric and gas utilities, regulatory agencies, ISOs and RTOs,

16 and legislative bodies.

17 I have testified or appeared before regulators, legislative bodies and government

18 agencies multiple times in several states within the US and abroad. My testimonies have

19 addressed a wide range of issues including net energy metering (NEM), electricity rate

20 design, energy efficiency, demand response, and demand forecasting. My most recent

21 testimony on NEM was before the California State Assembly in the context of AB 942.<sup>1</sup>

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<sup>1</sup> <https://www.energycentral.com/renewables/post/my-testimony-ab-942-net-metering-5tAyAhY8pvElwzN>.

22 My most recent testimony on NEM before a state regulatory commission was in South  
23 Carolina on behalf of Duke Energy.<sup>2</sup>

24 I have also published widely on a variety of energy issues involving the customers. My  
25 work has been cited extensively on Google Scholar<sup>3</sup>, in the media, and in the trade press.  
26 I have participated in seminars and webinars and interacted extensively with experts in  
27 20 countries on 6 continents.

28 I serve on the editorial advisory board of *The Electricity Journal* <sup>4</sup> and have authored or  
29 coauthored more than 150 papers in peer-reviewed and trade journals dealing with  
30 various aspects of rate design, demand side management, energy efficiency, demand  
31 response, load forecasting, decarbonization and electrification. I have also co-edited 5  
32 books on industrial structural change, customer choice, and electricity pricing and edited  
33 two issues of *The Electricity Journal* on electricity pricing.

34 I have a Ph. D. in economics from the University of California (UC) at Davis. I have taught  
35 economics at the University of Karachi (Pakistan), UC Davis and San Jose State  
36 University and given guest lectures at several other universities including Carnegie  
37 Mellon, Georgia Tech, MIT, New Mexico State, Northwestern, Stanford, the University of  
38 Idaho and UC Berkeley.

39 Additional details are contained in my resume, which appears as **Exhibit A** of my  
40 testimony.

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<sup>2</sup> [https://www.brattle.com/wp-content/uploads/2021/08/21853\\_rebuttal\\_testimony\\_and\\_exhibit\\_of\\_ahmad\\_faruqui.pdf](https://www.brattle.com/wp-content/uploads/2021/08/21853_rebuttal_testimony_and_exhibit_of_ahmad_faruqui.pdf).

<sup>3</sup> <https://scholar.google.com/citations?user=sPqzdacAAAAJ&hl=en>.

<sup>4</sup> <https://www.sciencedirect.com/journal/the-electricity-journal/about/editorial-board>.

42 II. DIRECT TESTIMONY

43 **Q.4 What is the purpose of your testimony?**

44 A. To support the continuation of NEM in Puerto Rico, limit increases in the monthly fixed  
45 fee, to promote energy efficiency and decoupling, and to support the modernization of  
46 electric rates.

47 **Q.5 Have you installed solar panels at your home?**

48 A. Yes, I live in the San Francisco Bay Area, east of the Berkeley hills. The summers are  
49 very hot, and it is sunny on most days of the year. My experience with solar and storage  
50 during the years 2020-2023 is described in an article which appeared in PV Magazine.<sup>5</sup>

51 **Q.6 Do you support NEM?**

52 A. Yes, I do. It is the best way to support the installation of solar panels on customer  
53 premises. Solar panels enhance affordability and, when paired with batteries, they also  
54 enhance resilience. Solar energy helps in the decarbonization of the power system and  
55 helps mitigate climate change. In Puerto Rico, NEM has driven the adoption of residential  
56 solar and storage systems. Utility customers have invested heavily in these systems that  
57 are helping to prevent blackouts. These systems will help Puerto Rico reach its 2050 goal  
58 of 100% renewable energy with no cost to the government.

59 **Q.7 Why is NEM relevant in Puerto Rico?**

60 A. Puerto Rico has a tropical climate that requires customers to air condition their homes,  
61 resulting in higher electric bills than would otherwise be the case The residential price of  
62 electricity in Puerto Rico is now about 25 cents/kWh, much higher than the US average

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<sup>5</sup> <https://pv-magazine-usa.com/2024/07/26/interview-my-experience-as-a-battery-energy-storage-homeowner/>

63 of 17 cents<sup>6,7</sup> Electric bills are averaging \$115 per month<sup>8</sup>, higher than most people can  
64 afford to pay in Puerto Rico.

65 The median family income in Puerto Rico is \$32,091 per year<sup>9</sup>, only a third of the US  
66 average of \$102,800.<sup>10</sup> The poverty rate in Puerto Rico is 41.6%, almost four times the  
67 poverty rate of 11.5% in the US.<sup>11</sup> Without solar panels, it becomes very difficult for  
68 Puerto Ricans to live comfortably in their homes.

69 **Q.8 What will happen if NEM ends in Puerto Rico?**

70 A. If it is applied retroactively to existing solar customers, it will represent a violation of an  
71 existing contract.

72 If applied to new customers, it will extend the payback period for those who were thinking  
73 of buying the solar system. It will raise the monthly payments for those who were thinking  
74 of leasing the solar system. In both cases, the net result will be a dramatic reduction in  
75 the number of households who install solar. This will impair Puerto Rico's ability to meet  
76 its decarbonization goals. Furthermore, the solar industry in Puerto Rico is more than a  
77 billion-dollar industry each year<sup>12</sup>, so a large contraction in the industry would lead to lost  
78 jobs and economic activity on the archipelago.

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<sup>6</sup> EIA. May 2025. "Electric Power Monthly"

[https://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.php?t=epmt\\_5\\_6\\_a](https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a)

<sup>7</sup> In 2024, customers who consumed 800 kilowatt hours were paying 23.77 cents per kwh, compared with the previous 22.72 cents, according to Puerto Rico's Energy Bureau. That's 41% more than the average U.S. electricity rate, which is 16.88 cents per kwh, according to the U.S. Energy Information Administration. Puerto Rico approves electricity rate increase weeks after massive blackout | AP News.

<sup>8</sup> Find Energy. 2025. "Electricity Companies & Statistics in Puerto Rico." <https://findenergy.com/pr/>

<sup>9</sup> [https://data.census.gov/profile/Puerto\\_Rico?g=040XX00US72#income-and-poverty](https://data.census.gov/profile/Puerto_Rico?g=040XX00US72#income-and-poverty)

<sup>10</sup> <https://www2.census.gov/library/publications/2024/demo/p60-282.pdf>

<sup>11</sup> [https://www.census.gov/library/publications/2023/demo/p60-280.html#:~:text=Highlights-Official%20Poverty%20Measure,\(Table%20A%2D3\).](https://www.census.gov/library/publications/2023/demo/p60-280.html#:~:text=Highlights-Official%20Poverty%20Measure,(Table%20A%2D3).)

<sup>12</sup> SESA-PR. July 2024. "Impacts of the devaluation of the net metering policy in Puerto Rico." [https://www.sesapr.org/\\_files/ugd/a17184\\_020e00cfa1eb4a5ba82a5b2e71842743.pdf](https://www.sesapr.org/_files/ugd/a17184_020e00cfa1eb4a5ba82a5b2e71842743.pdf)

79 **Q.9 Are you aware of the impact that ending NEM in California had on new solar**  
80 **installations in the state?**

81 A. Yes, I am aware of the impact that ending NEM had on new solar installations. Soon  
82 after the Net Billing Tariff (NBT) was proposed as a successor to NEM 2.0 by the CPUC  
83 in a Proposed Decision in December 2021<sup>13</sup>, I participated in a debate with Professor  
84 Severin Boresnstein of UC Berkeley, a well-known academic, on the consequences that  
85 would ensue.<sup>14</sup>

86 The Proposed Decision contained three elements:

- 87 1. Reduce export compensation dramatically by about 75%  
88 2. Apply a monthly grid access charge of \$8/kW on solar customers  
89 3. Apply the changes retroactively to existing customers after 15 years, instead of 20  
90 years.

91 A modified version of the NBT was approved by the CPUC in December 2022<sup>15</sup>. It only  
92 included the first provision for dramatically reducing export compensation. That alone  
93 resulted in a precipitous drop in new solar sales.

94 **Q.10 What was the magnitude of the drop in new solar sales?**

95 A. It was dramatic, as shown in the figure below.<sup>16</sup>

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<sup>13</sup> <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M430/K903/430903088.PDF>

<sup>14</sup> <https://www.canarymedia.com/articles/solar/live-debate-how-to-fix-rooftop-solar-policy-in-california>.

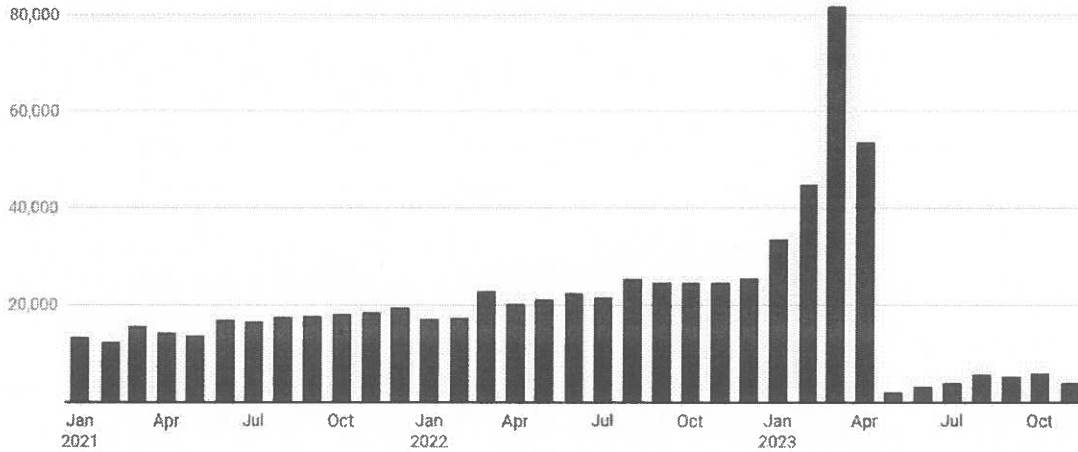
<sup>15</sup> <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/net-energy-metering-nem/nemrevisit/final-december-2022-fact-sheet-nem.pdf>.

<sup>16</sup> <https://calmatters.org/environment/climate-change/2024/01/california-solar-demand-plummets/>



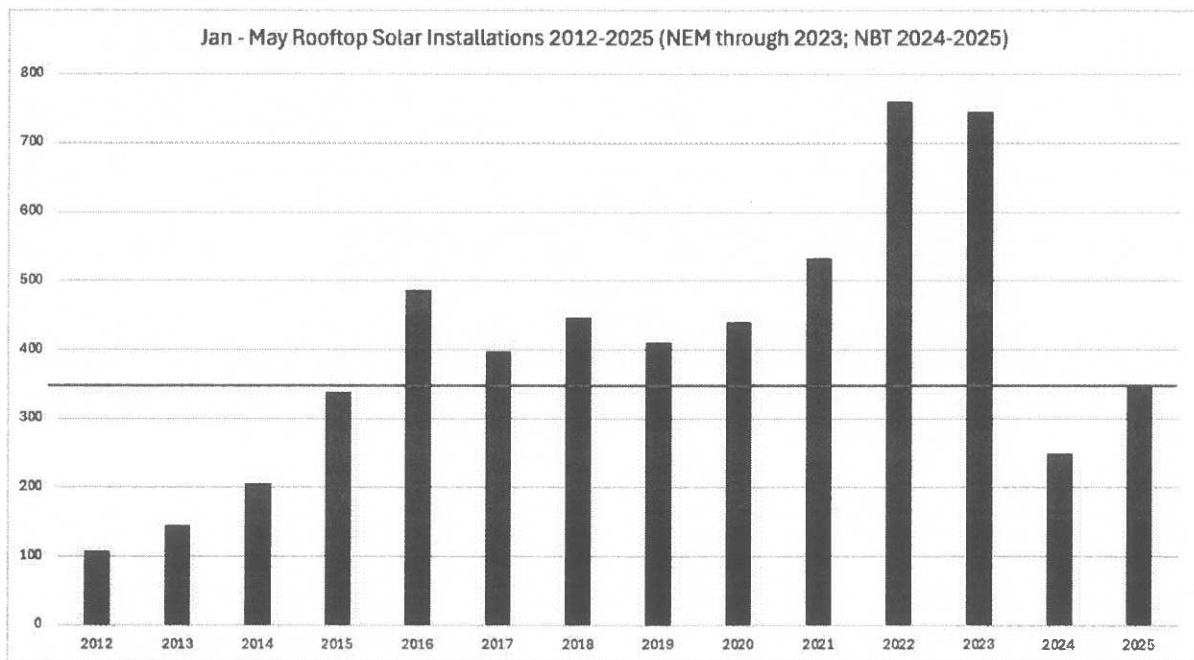
## Steep decline in California's rooftop solar applications

Consumers rushed to beat an April, 2023 deadline to avoid being paid lower rates for solar power they sell back to the grid. That drove a dramatic increase in homeowners' solar interconnection applications for three months. But that was followed by a 90% decline last May compared to May, 2022. Applications have started to tick back up, but slowly.



96

97 The impact of the NBT on residential and commercial installations, measured in MW, is  
 98 shown below. The impact was dramatic in 2024. In 2025, the impact decreased because  
 99 of the imminent ending of the US federal income tax credit. I would expect the lower  
 100 numbers to return in a year or two.



101

**Q.11 Why has ending NEM in California dramatically slowed down solar sales?**

A. Export compensation accounts for a large share of the savings that accrue to customers. When the price of exports is lowered by 80%, as was the case with the NBT, the bill savings from solar installations fall dramatically, resulting in lower adoption rates. I discuss this further by using my own data as an example. I installed solar with one battery in December 2019. That installation was done during NEM 2.0. In December 2022, I published an analysis showing how ending NEM was likely to impact new solar installations. I concluded that if NEM 2.0 did not exist, I would probably not have installed solar panels or a battery. In December 2022, I published an analysis that explains why.<sup>17</sup> In my article, I state: "Under net energy billing [which replaced NEM], export compensation will drop down by 80% in five years and then hold steady. My pre-solar bill was \$200 a month. Under NEM 2.0, the post-solar-plus-storage bill is \$50 a month, representing a savings of \$150 a month. Using a rule of thumb, I am estimating that 60% of the monthly bill savings (or \$90) from my solar-plus-storage system comes from reducing usage and 40% from export (or \$60). Some 80% of the export savings (\$48) will disappear, leaving me with just \$12 of savings from exports."

**Q.12 Does NEM create a cost shift from solar to non-solar customers in California?**

No. This point is often made in rate cases by utilities and their expert witnesses. However, Dr. Richard McCann<sup>18</sup> has shown that it does not create a cost shift in California. He documented five major problems with the cost shift analysis that was carried out by the Public Advocates Office (PAO):

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<sup>17</sup> <https://pv-magazine-usa.com/2022/12/22/comparing-customer-value-of-solar-plus-storage-under-net-energy-metering-versus-net-energy-billing/>.

<sup>18</sup> <https://www.canarymedia.com/articles/solar/californias-rooftop-solar-is-a-benefit-not-a-cost-to-the-state>.

123 PAO used incorrect inputs for rates and for solar output. They claim their average rate is  
124 weighted by typical solar output, but the result does not align with a correct solar weighting  
125 of average rates. In calculating the average rates experienced by solar customers, they  
126 fail to include the fact that 15% of solar customers are on CARE [low income] rates. They  
127 also use a 20% solar capacity factor, which is far out of step with well-established values  
128 on the order of 17.5%.

129 They include self-generation as a cost to the utilities, as if customers are obligated to buy  
130 all their electricity from the utilities. Generating and consuming electricity onsite in real  
131 time simply results in purchasing less electricity from the utilities, just like energy  
132 efficiency. It is incorrect to count this as a cost to the utilities.

133 They use the Avoided Cost Calculator (ACC) to measure the current benefits from  
134 previous solar installations. The ACC is a forward-looking tool that is not built to measure  
135 the benefits of previous activity. Pretending that all existing solar systems were installed  
136 this year and estimated the utility cost reduction only within this year is an egregious flaw  
137 in the fundamental approach of PAO.

138 PAO ignores the fact that when CARE customers generate their own energy, they reduce  
139 the cost of the CARE subsidy that is borne by other ratepayers.

140 They ignore the bill payments that are made by solar customers after installing solar.  
141 Again, PAO's basic approach does not match the purpose. They set out to determine if  
142 solar customers are paying their fair share of utility fixed costs, but they only look at part  
143 of the solar customers' bills.

144 Eleven energy experts, including former commissioners and utility executives, and well-  
145 known academics, researchers and consultants and I reviewed his analysis and

146 supported Dr. McCann's conclusions in a letter that we sent to Governor Gavin  
147 Newsom.<sup>19</sup>

148 It is also worth stating that solar customers used to be large users of electricity who  
149 overpaid their fixed costs for years. Viewed over their lifetime, solar users do not create  
150 a cost shift, even using the narrow analytical framework that is often put forward by  
151 utilities.<sup>20</sup>

152 In Puerto Rico, Gabel Associates has estimated that net metered solar customers provide  
153 a value of 32.90 cents per kWh to the grid, which is much higher than the net metering  
154 credit of around 24.12 cents per kWh that is provided to them. If broader local economic  
155 value and reduction in air pollution and climate change are included in the value  
156 calculation, the value that solar customers provide to society as a whole rises to 103.13  
157 cents per kWh.<sup>21</sup>

158 **Q.13 Do solar customers create a cost shift in Puerto Rico?**

159 A. No, for all the same reasons that I have discussed for California. In fact, since more  
160 than 85% of solar customers in Puerto Rico have installed batteries, the value that solar  
161 customers provide to the grid in Puerto Rico is likely to be higher than the value they  
162 create in California.

163 **Q.14 LUMA witness Balbis, a former state regulator in Florida, states on lines 510-**  
164 **518 that "[T]he Florida legislature sought to modify net metering in the state.**  
165 **Specifically, in November 2021, the introduction of Senate Bill (SB) 1024 sought a**

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<sup>19</sup> <https://ahmadfaruqui.blogspot.com/2024/12/eleven-energy-experts-rebut-solar-cost.html>.

<sup>20</sup> <https://pv-magazine-usa.com/2024/11/08/are-californias-electricity-prices-rising-because-customers-are-installing-solar-panels/>

<sup>21</sup> Gabel Associates. 2024. "Value of Net Metered Solar Energy in Puerto Rico."

[https://www.sesapr.org/\\_files/ugd/a17184\\_b4d31883d1ff4a15b9a6922795cbe9ea.pdf](https://www.sesapr.org/_files/ugd/a17184_b4d31883d1ff4a15b9a6922795cbe9ea.pdf)

166 **redesign of net metering to avoid cross subsidization of electric service costs**  
167 **between classes of ratepayers and reduce the compensation net-metered**  
168 **customers receive from the utility's retail rate to the lower avoided cost rate."**

169 A. As noted by an editorial in the *Miami Herald*, this was a significant misrepresentation  
170 of facts in a state whose moniker is The Sunshine State. <sup>22</sup>

171 **Q.15 Was this bill written by legislators to address an existing problem?**

172 A. No, the bill was written by Florida Power and Light (FPL) lobbyists who have an axe to  
173 grind. The state senators and representatives who introduced it both received significant  
174 compensation from investor-owned utilities in Florida.<sup>23</sup> These legislators were serving  
175 the profit-seeking interests of FPL. Their work on this bill was not based on any studies  
176 or data on costs and benefits presented by utilities.

177 **Q.16 LUMA witness Balbis concedes on lines 518-19 that "This bill passed the**  
178 **legislature but was ultimately vetoed by the governor." Why was it vetoed?**

179 A. Governor Ron DeSantis of Florida vetoed the bill, noting that "The amount that may be  
180 recovered under this provision [to redesign NEM] is speculative and would be borne by  
181 all customers."<sup>24</sup> By so doing, the governor preserved Florida's reputation for being the  
182 Sunshine State.

183 **Q.17 Does witness Balbis leave out important details of what transpired in Florida?**

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<sup>22</sup> Editors. February 2, 2022. "FPL wants to control solar power. And state lawmakers are doing its bidding."  
Miami Herald. <https://www.miamiherald.com/opinion/editorials/article257892308.html> ;

<sup>23</sup> Alissa Jean Schafer. December 6, 2021. "Records show senior Florida Power and Light execs closely  
connected to election scandals." Energy & Policy Institute. <https://energyandpolicy.org/records-show-senior-florida-power-light-execs-closely-connected-to-election-scandals/>.

<sup>24</sup> Governor Ron DeSantis. April 27, 2022. "HB 741 Veto transmittal  
letter." <https://www.flgov.com/eog/sites/default/files/press/4.27.22-Veto-Transmittal-Letter.pdf>.

184 A. Yes. He only presents part of the story of the PSC workshop on net metering in Florida  
185 in 2020 (Balbis Lines 496-500). The \$700 million amount from Florida utilities is an  
186 estimate based on lost revenues, not on actual costs. This estimate is not based on  
187 studying the costs and benefits of net metered customers. Cost-of-service ratemaking  
188 must be based on actual net costs. During the workshop, Florida's Office of Public  
189 Counsel noted "net metering is in most cases a net benefit — for the utility and for non-  
190 solar rate-payers." PSC "...Commissioner Julie I. Brown said she wanted to see more net  
191 metering, not less. "There's such a flavor, or appetite for solar," Brown said. "It's really  
192 quite modest if you look at the data, quite frankly. So I would be interested in seeing how  
193 the utilities really promote the solar net metering policy that we have in place."<sup>25</sup>

194 **Q.18 Should solar customers be required to pay an additional monthly charge over**  
195 **and beyond what non-solar customers pay, as argued by witness Shannon?**

196 A. No. There is no reason to discriminate against solar customers. As noted above, they  
197 provide substantial value to the grid, not just to themselves.

198 **Q.19 Should the monthly fixed charge be raised in Puerto Rico?**

199 A. No. The charge currently stands at \$4 a month. As noted above, the median income in  
200 Puerto Rico is a quarter of the median income in the US. And the poverty rate is four times  
201 higher. Puerto Rico is in an affordability crisis. This is not the time to raise the fixed charge.

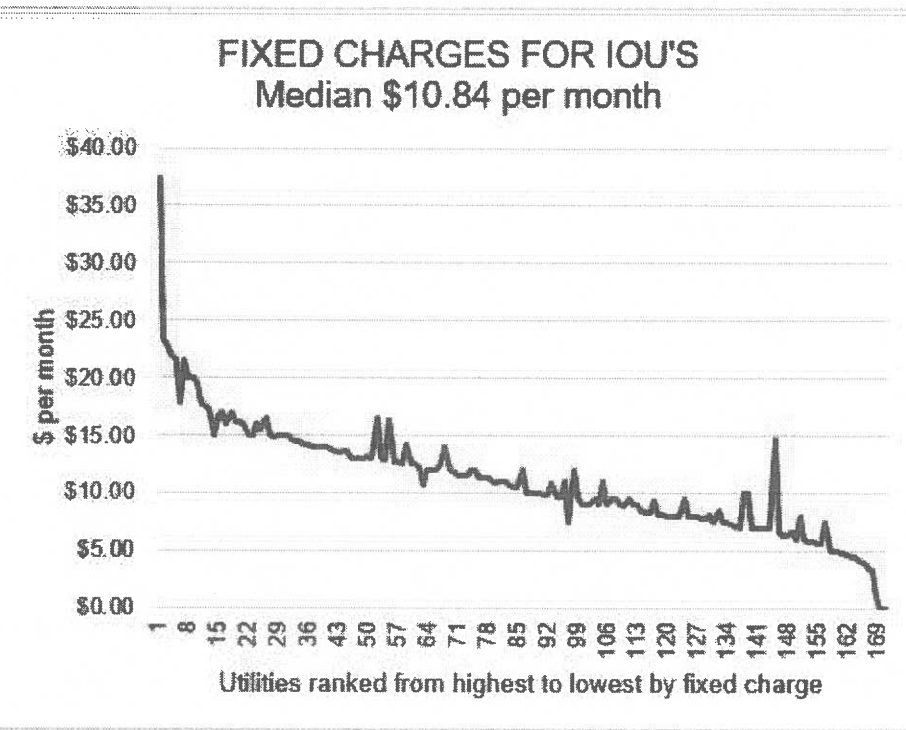
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<sup>25</sup> Mary Ellen Klas. September 18, 2020. "Legislator opens door for regulator to weaken rule that helps rooftop solar market." Miamiherald. <https://www.miamiherald.com/news/business/article245799155.html>

Q.20 As noted in Witness Datta's testimony, some parties are proposing to raise the fixed charge to \$29.4 per customer per month for an average user of 425 kWh in FY27. Do you support that?

A. No. The fixed charge should only be used to recover the cost of metering, billing and customer care. In some cases, it is also used to recover a portion of the cost of the power line that runs from the house to the transformer. The fixed charge cannot be used to recover all fixed costs of the utility.

In the US, as of two years ago, the median fixed charge for residential customers was under \$10.84 a month across 171 investor-owned utilities.<sup>26</sup> The proposed charge would be way out of line with the median charge.



<sup>26</sup> The average fixed charge was \$11.15 per customer per month. <https://eq-research.com/wp-content/uploads/2023/04/20230411-Residential-Fixed-Charges.pdf>. The graph is based on data provided by EQ Research.

213 Furthermore, gradualism is a well-established principle of rate design. The fixed charge,  
214 even if it is cost reflective, cannot be increased by a factor of 10 in a couple of years.  
215 High fixed charges will raise bills for low consumers of electricity. These tend to be people  
216 living by themselves in apartments or couples living in small or energy efficient homes.  
217 They also include people who have installed solar panels. All of these customers should  
218 be rewarded for contributing to Puerto Rico's energy goals, not penalized.

219 **Q.21 Should the existing electric rate schedule be modified to encourage the**  
220 **installation of batteries and to reduce the strain on the grid during peak periods,**  
221 **and especially during the top 100 hours of the year when supply shortages are**  
222 **imminent?**

223 A. Yes. The existing rate is comprised of a service charge and many riders. The service  
224 charge is a two-tier inclining block rate, but the second tier is just 13% higher than the  
225 first tier. This falls to only a 3% difference if all the current riders are included. Further  
226 diluting the price signal is that the share of the service charges in the total bill is about a  
227 quarter. The other charges do not have tiers.

228 In the near term, it would make sense to (1) widen the spread in rate between the tiers  
229 and possibly introduce a third tier and (2) apply the tiered rate structure to the entire rate,  
230 not just to the service charge.

231 Inclining block rates (IBRs) make sense when energy costs rise with usage, and when  
232 power outages are common, as they do in Puerto Rico.<sup>27</sup> IBRs are one of several ways  
233 to promote the efficient use of electricity and optimize the use of scarce energy resources.

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<sup>27</sup> <https://www.fortnightly.com/fortnightly/2008/08/inclining-toward-efficiency>.



234 Puerto Rico generates electricity largely based on imported fuels. Energy efficiency  
235 should be enhanced through demand-side management programs, efficient rate design  
236 and customer education and outreach.

237 **Q.22 To accelerate energy efficiency, would it be useful to decouple utility revenues**  
238 **with kWh sales?**

239 A. Possibly, and that is what many states have done in the US. However, decoupling  
240 should not be used as a pretext to request rate increases. As noted by Witness Datta in  
241 his testimony, rates should be based on prudentially-incurred costs, not on projected lost  
242 revenues.

243 **Q.23 How widespread is the deployment of smart meters in Puerto Rico?**

244 A. Deployment of 1.5 million smart meters began in April 2025. It is expected to be  
245 completed in three years.<sup>28</sup>

246 **Q.24 Once smart meters are deployed, should newer rate designs be considered**  
247 **for deployment in Puerto Rico?**

248 A. Yes. A much better rate design than the existing tariff is a time-of-use (TOU) rate which  
249 reflects variation in cost across the hours of the day, and across the seasons of the year.  
250 A typical TOU rate consists of two or three pricing periods. It is best to have a short  
251 duration of the peak period, to encourage customers to lower their usage during the peak  
252 period, and to shift some of it to less-costly off-peak periods.<sup>29</sup>

253 **Q.25 What is the US experience with TOU rates?**

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<sup>28</sup> <https://www.utilitydive.com/news/luma-installs-puerto-rico-smart-meter-iron/745363/#:~:text=Through%20LUMA's%20partnership%20with%20Iron,rollout%20to%20take%20three%20years.>

<sup>29</sup> <https://www.publicpower.org/periodical/article/what-weve-learned-half-century-time-varying-rates.>

254 A. TOU rates are being widely deployed in several states.<sup>30</sup> Just a couple of decades ago,  
255 only 1-2% of customers were on TOU rates. Today, more than 10% of customers are on  
256 these rates, and the percentage is rising. More states are moving in that direction. Most  
257 of these states are deploying these rates on an opt-in basis but a few are deploying them  
258 on an opt-out (default or standard) basis. California, Colorado and Michigan have already  
259 implemented opt-out TOU rates. Minnesota<sup>31</sup> and Missouri<sup>32</sup> are considering moving in  
260 the same direction. Fort Collins, a municipal utility in Colorado, has deployed them on a  
261 mandatory basis.

262 I have recently made a case for implementing TOU rates in Alaska<sup>33</sup> and in Hawaii<sup>34</sup>.  
263 Two years ago, I testified on the topic in New Jersey<sup>35</sup> and have testified earlier on the  
264 topic in several other states across the US.

265 **Q.26 Will TOU rates work in Puerto Rico.**

266 A. Yes, they have worked globally in a variety of climates and across a wide range of  
267 sociodemographic and economic segments.

268 Indeed, they have already been tested in Puerto Rico, going back to President Jimmy  
269 Carter's era. During Carter's presidency, the US Federal Energy Administration carried  
270 out several pilots with Time Varying Rates (TVRs) of which was in Puerto Rico. It showed

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<sup>30</sup> <https://www.latitudemedia.com/news/after-fifty-years-time-of-use-rate-tariffs-are-gaining-traction/>.

<sup>31</sup> <https://www.startribune.com/xcel-customers-in-minnesota-can-soon-choose-varying-electricity-rates/601236011>.

<sup>32</sup> <https://www.eenews.net/articles/missouri-overhauls-electric-rates-raising-rewards-and-risks-for-customers/>.

<sup>33</sup> [https://www.linkedin.com/posts/ahmad-faruqui-0177b83\\_the-inequity-and-inefficiency-of-flat-rates-activity-7349245950562902019-Vm0V/](https://www.linkedin.com/posts/ahmad-faruqui-0177b83_the-inequity-and-inefficiency-of-flat-rates-activity-7349245950562902019-Vm0V/).

<sup>34</sup> <https://thefridaytimes.com/31-May-2025/what-i-learned-about-electricity-rates-from-the-2025-hawaii-energy-conference>.

<sup>35</sup> <https://www.brattle.com/wp-content/uploads/2024/01/P-10-FARUQUI-TESTIMONY-AND-SCHEDULES.pdf>.

that households were able to respond to the price signal and shift their usage pattern. I discuss the design and results of the pilot in a paper.<sup>36</sup>

### III. CONCLUSION AND RECOMMENDATIONS

#### **Q.27 What are your closing recommendations?**

A. First, Puerto Rico should not change any of the elements of NEM. Second, it should strengthen the incentive for Puerto Ricans to install solar systems paired with battery storage. Third, it should move toward TOU rates to ensure that solar customers will lower their peak load by moving it to off-peak periods. By so doing, they will have a very different net load profile than other lower users. This will go a long way toward addressing the concern voiced by certain parties that solar customers don't pay their fair share of the grid cost.

Battery storage, paired with solar panels, provides enhanced value in Puerto Rico, given the number of outages that take place annually in Puerto Rico. During emergencies, solar and storage installed on customer premises can also act as a Virtual Power Plant, as in LUMA's Customer Battery Energy Sharing (CBES) program.

Ending NEM will dramatically slow down the adoption of solar panels and batteries, further increasing the energy burden for most Puerto Ricans. Only the very wealthy will be able to install solar and storage in the absence of NEM and be able to keep their lights on during the frequent power outages that plague the residents of Puerto Rico.

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<sup>36</sup> Ahmad Faruqui and J. Robert Malko, "Residential Demand for Electricity by Time-of-Use: A Survey of Twelve Experiments with Peak Load Pricing," *Energy* 8, no. 10 (1983): 781-795.

290 **Q.28 Should steps be taken to accelerate solar deployment by making it less**  
291 **expensive to install solar steps with batteries?**

292 A. Yes, the best way to do this would be to find ways to lower the cost of installing solar  
293 panels and batteries. Once these costs go down, solar and storage will also attract low-  
294 income households. Currently, in Puerto Rico, more than 80% of residential customers  
295 have not installed solar panels.

296 **Q.29 Does that conclude your testimony?**

297 A. Yes.

### ATTESTATION

Affiant, Ahmad Faruqi states the following under penalty of perjury:


The prepared Direct Testimony and the exhibit attached to the Direct Testimony, constitute my Direct Testimony in the above-styled case before the Puerto Rico Energy Bureau. I would give the answers set forth in the Direct Testimony if asked the questions that are included in the Direct Testimony. I further state that the facts and statements provided herein are my Direct Testimony and, to the best of my knowledge, are true and correct.

In Danville, California this 8<sup>th</sup> day of September, 2025.

  
Ahmad Faruqi

The foregoing instrument was acknowledged and subscribed before me by Ahmad Faruqi, of legal age, married, and resident of Danville, California, who has been identified by means of his California driver's license number N6214535,

In Danville, California this 8<sup>th</sup> day of September 2025.

  
Notary Public

