

COMMONWEALTH OF PUERTO RICO
PUERTO RICO ENERGY COMMISSION

IN RE: THE PUERTO RICO ELECTRIC
POWER AUTHORITY

INITIAL RATE REVIEW

No. CEPR-AP-2015-0001

SUBJECT: TESTIMONY IN SUPPORT
OF PETITION

Direct Testimony of

RALPH ZARUMBA

Director, Navigant Consulting, Inc.

EUGENE GRANOVSKY

Managing Consultant, Navigant Consulting, Inc.

On behalf of the

Puerto Rico Electric Power Authority

May 27, 2016

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1 **I. INTRODUCTION**

2 **A. Witness Identification**

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

4 A. We are Ralph Zarumba and Eugene Granovsky. We are collectively sponsoring this
5 testimony.

6 Ralph Zarumba is a Director at Navigant Consulting, Inc. ("Navigant"), a global
7 business and advisory firm. His business address is 30 S. Wacker Drive, Suite 3100,
8 Chicago, Illinois 60606.

9 Eugene Granovsky is Managing Consultant at Navigant. His business address is
10 30 S. Wacker Drive, Suite 3100, Chicago, Illinois 60606.

11 **Q. On whose behalf are you testifying?**

12 A. We are testifying as a panel on behalf of the Puerto Rico Electric Power Authority
13 ("PREPA"), a publicly-owned (public power) electric utility and instrumentality of the
14 Government of the Commonwealth of Puerto Rico (the "Commonwealth").

15 **B. Summary of Testimony and List of Attachments**

16 **Q. What is the purpose of your testimony?**

17 A. We are testifying in support of PREPA's Petition requesting that the Puerto Rico Energy
18 Commission (the "Commission") approve and establish new rates for PREPA. More
19 specifically, our testimony presents and supports what is commonly referred to as the
20 embedded cost of service study or "ECOSS". This study is used in the development of
21 rates as indicated below and as addressed in our direct testimony on the subject of rate

design, PREPA Exhibit ("Ex.") 4.0. The ECOSS has been properly prepared for this purpose.

C. Professional Background & Education

Q. Would each of you please describe your educational background and professional experience?

A. Yes. My name is Ralph Zarumba. My background and experience is discussed in PREPA Ex. 4.0. My resume is PREPA Exhibit ("Ex.") 4.01.

My name is Eugene Granovsky. My background and experience also is discussed in PREPA Ex. 4.0. My resume is PREPA Ex. 4.02.

Q. Are there any additional exhibits to your testimony?

A. Yes. We are sponsoring the following additional exhibits:

- PREPA Ex. 8.01: Tariff Names and Descriptions
- PREPA Ex. 8.02: Functionalization Method
- PREPA Ex. 8.03: Functionalization Labor Ratio
- PREPA Ex. 8.04: Functionalization Gross Plant Ratio
- PREPA Ex. 8.05: Functionalization of Maintenance and Investment Capex
- PREPA Ex. 8.06: Bad Debt Assignment
- PREPA Ex. 8.07: Functionalized Revenue Requirements
- PREPA Ex. 8.08: Classification Method
- PREPA Ex. 8.09: Purchased Power Classification Factor
- PREPA Ex. 8.10: Classification Gross Plant Ratios

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- PREPA Ex. 8.11: Classification Labor Ratio
- PREPA Ex. 8.12: Classification Gross Plant Ratios (with General Plant)
- PREPA Ex. 8.13: Classification of Maintenance and Investment Capex
- PREPA Ex. 8.14: Classified Revenue Requirements

Q. Did you prepare, or have prepared under your supervision, any of the Schedules and other papers submitted to the Commission under its Regulation No. 8720 as support for and attached to PREPA's Petition for new rates?

A. Yes, we prepared or have had prepared under our supervision Schedules G-1, G-2¹, G-3, G-4, G-5, and G-6.

II. EMBEDDED COST OF SERVICE STUDY – METHODOLOGY

Q. What is an Embedded Cost of Service Study (ECOSS)?

A. An ECOSS is the process used to assign or allocate a portion of a utility's overall "Revenue Requirement" to each of the utility's separate Tariff Rate classes. The theory of ECOSS is found in electric industry regulation where the utility is authorized to recover its Revenue Requirement from the customers it serves. PREPA's Revenue Requirement is covered in detail in PREPA Ex. 5.0, but in general a Revenue Requirement describes the applicable costs of the utility in serving its customers. The ECOSS is predicated upon the assumption that each Tariff Class should pay their share of this Revenue Requirement based on an equitable allocation of the costs of the utility. In

¹ Schedule G-2 is defined as "a fully allocated embedded cost of service at proposed rates." However, because we do not use a revenue allocator, an embedded cost of service at proposed rates is identical to "a fully allocated embedded cost of service at present rates," which is Schedule G-1.

62 stating this assumption, we do not mean to suggest that this is the only rate design
63 principle taken into account in setting rates. *See* PREPA Ex. 4.0.

64 Most utilities perform an ECOSS in order to break down the complexities of all
65 direct, joint, and common costs by function and classification, while following the
66 principle of cost causation. An ECOSS demonstrates whether current revenues collected
67 through the utility's rates cover the cost to serve electric customers in each Tariff Class.
68 Therefore, the results of an ECOSS can be used as a guide (along with other ratemaking
69 considerations) in determining appropriate electric rates for a utility's Tariff Classes.

70 Q. **Are there distinct steps used to prepare an ECOSS?**

71 A. Yes. An ECOSS generally employs three separate processes commonly referred to in the
72 utility industry as Functionalization, Classification, and Allocation. Combined, these
73 processes are a widely accepted method used to determine how a utility assigns cost
74 responsibility to Tariff Classes for whom the costs are incurred when the utility provides
75 electrical services. Simply stated, these three steps provide a logical basis that quantifies
76 what it costs a utility to provide electric services in order to serve the majority of its
77 customers.

78 Q. **Please describe Functionalization.**

79 A. Functionalization recognizes the different services provided by the electric utility system.
80 Functionalization is the process of separating the utility's Revenue Requirement into each

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81 of the major electric utility functions: Production; Transmission; Distribution, Customer,
82 General².

83 General Plant (e.g., a utility's headquarters building, if the utility owns the
84 building) and other common functions are generally spread among the Production,
85 Transmission, and Distribution functions.

86 Q. **Please describe the Classification process.**

87 A. Classification follows Functionalization in an ECOSS. The National Association of
88 Regulatory Utility Commissioners ("NARUC") defines Classification as follows:
89 "Classification is a refinement of functionalized revenue requirements. Cost
90 classification identifies the utility operation -- demand, energy, customer -- for which
91 Functionalized dollars are spent."³ The Classification step separates costs into groups
92 bearing a relationship to measurable costs-defining service characteristics provided by a
93 utility. Therefore, Classification identifies the cost driver for components of each
94 function of Revenue Requirement. Examples of common classifiers are as follows:

- 95 1. Demand-related costs incurred by the utility to meet the maximum demand; and
- 96 2. Energy costs triggered by energy consumption or production;

97 Customer classifiers are used when costs are fixed, regardless of the amount of electricity
98 sold to its customers.

99 Q. **Please describe the Allocation process.**

² Navigant has adopted three functions in the attached ECOSS but recognizes other definitions may be used in other circumstances.

³ NARUC, Electric Utility Cost Allocation Manual, January 1992, page 34.

100 A. Once the Revenue Requirement has been functionalized and classified, the next step is to
101 allocate those dollars within the Tariff Classes. Because Tariff Classes are generally
102 composed of multiple rate variations, the Allocation process aims to ensure that each
103 unique rate class is contributing the appropriate amount to the overall Revenue
104 Requirement. This equitable sharing is achieved through the use of allocation factors,
105 which specify each Tariff Class's share of a particular cost driver such as system peak
106 demand, energy consumed, or number of customers. The appropriate allocation factor is
107 then applied to the respective cost element to determine each Tariff Class's share of cost.
108 Examples of allocation factors could include the following:

- 109 1. Energy consumed which the utility sold;
- 110 2. Energy at the generation level;
- 111 3. Coincident peak kW demands which measure the demands placed on the utility at
112 the time of the utility system peak by each Tariff Class;
- 113 4. Non-coincident peak ("NCP") kW demand which reflects a Tariff Class's highest
114 hourly demand, which may not coincide with when the utility incurs its highest
115 overall system peak demand; and
- 116 5. Customer counts.

117 **III. DESCRIPTION OF PREPA'S EMBEDDED COST OF SERVICE STUDY**

118 Q. **Please describe the ECOSS analyses included in your testimony.**

119 A. Navigant prepared three ECOSS which correspond to the years being analyzed in this
120 proceeding. The different test cases are described below:

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1. A study based upon the existing FY 2017 Revenue Requirement (i.e., the FY 2014 test year Revenue Requirement with known and measurable changes through FY 2017) assuming the restructuring of the utility's bond obligations;
2. A study based upon the existing FY 2017 Revenue Requirement assuming **no restructuring** of the utility's bond obligations⁴; and
3. A study based upon the historical PREPA FY 2014 (July 1, 2013, to June 30, 2014) Revenue Requirement (as to the subject of Revenue Requirements, see PREPA Ex. 5.0).

Q. What were the revenue requirements for the three test cases as defined above?

A. The revenue requirements for the three test cases were:

1. \$3,462,194,772 for FY 2017 – Restructuring Scenario (Scenario 1);
2. \$4,282,408,830 for FY 2017 – No Restructuring Scenario (Scenario 2); and
3. \$5,258,481,224 for FY 2014 (Scenario 3).

The detailed elements of each of the scenarios are discussed in the Revenue Requirement section below.

Q. How did you develop allocators for each of the scenarios?

A. Allocators from FY 2014 values were adopted for the FY 2017 scenarios in cases where the resulting ratios were unlikely to change. This included the labor ratio, plant in service ratios, metering costs, purchased power classification percentage and efficiency by

⁴ Utility's bond obligations as well as a three year amortization of approximately \$700 million for fuel credit line.

voltage level. The remaining allocators were calculated using forecasted FY 2017 values including revenues, customer months, kWh sales, load factor and non-coincident peak.

Q. Please identify the PREPA Tariff Classes that are contained in the ECOSS.

A. PREPA Ex. 8.01 identifies the following: PREPA Tariff Code, Tariff Class (Residential, Commercial, industrial, etc.), Tariff Code Name, Voltage Service, Net Metering status and Tariff Description.

Q. Does PREPA's ECOSS follow the general structure as described in Section II?

A. Yes. As it relates to the classification, Navigant added some additional drivers of classification which are:

1. Contributions – Payments in lieu of taxes for municipalities and subsidies for certain rate classes as required by law;
2. Other Income – other operating income received by PREPA and credited to the overall customer group;
3. Public Lighting – all lighting owned and maintained by PREPA on behalf of its customers, i.e. street lighting, traffic lights, traffic signage, etc.; and
4. Separated Distribution Demand between Primary/Secondary⁵ and Secondary Only

The resulting structure is shown in Figure 1 below:

⁵ The distribution system is comprised of both primary and secondary voltages, and the costs are separated in order to properly assign costs to customers that use the corresponding facilities.

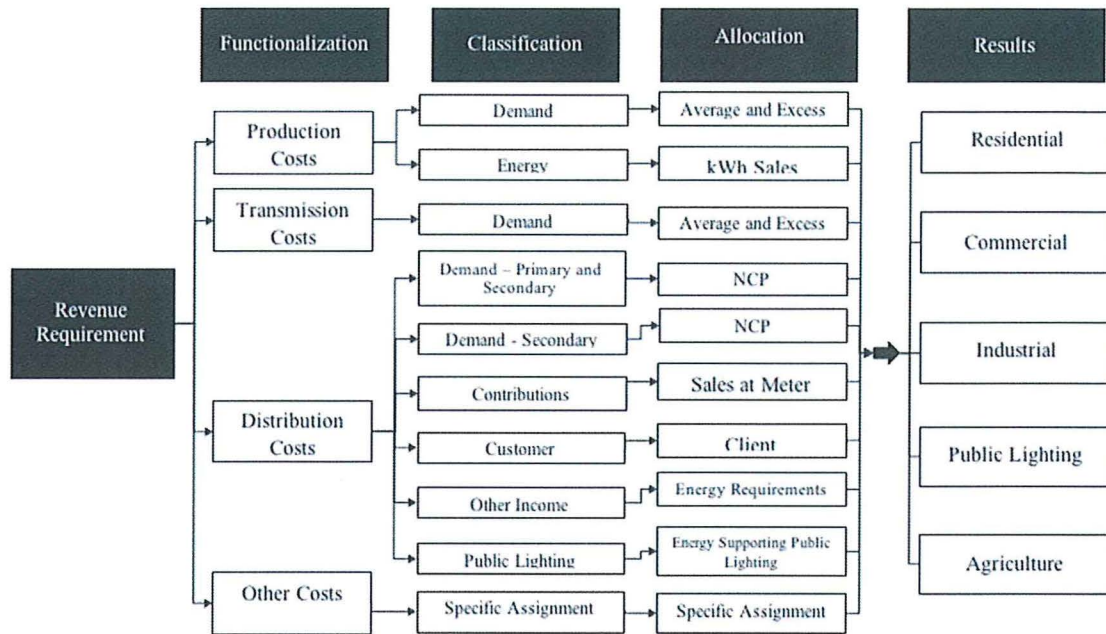


Figure 1: PREPA Embedded Cost of Service Study (“ECOSS”) Revenue Requirement

Process

Allocators are consistent with NARUC after considering PREPA’s availability of data as is discussed in detail below.

Q. Does the ECOSS present results as a Return for each Tariff Classification?

A. No. A “return” standard is a concept associated with Investor-Owned Utilities. As a public power entity, PREPA’s equivalent approach is the ratio of revenues to the allocated Revenue Requirement.

Q. Did your panel prepare PREPA’s Revenue Requirements?

A. No. The testimony filed in this proceeding by witnesses Dr. Frank Pampush, Lucas Porter, and Dan Stathos, PREPA Ex. 4.0, quantified PREPA’s Revenue Requirements and the three scenarios performed in the ECOSS.

A. ECOSS Functionalization of the Revenue Requirement

Q. Please identify which PREPA utility functions are used in the ECOSS.

A. The ECOSS functionalized costs into the following categories:

1. Production
2. Transmission
3. Distribution

Customer and General are dealt with in the Classification and Allocation sections below.

Q. How was the functionalized Revenue Requirement developed?

A. Each element of the Revenue Requirements was reviewed and assigned to a specific function. For elements that do not clearly belong to a single function, either a Gross Plant, Labor, or Capex (capital expenditure)⁶ ratio was used to spread the cost across the three functions.

The methods used are shown in PREPA Ex. 8.02, and referred to hereafter as the Functionalization Method.

Q. How was the Labor ratio calculated?

A. The FY 2014 Labor ratio was developed as the ratio between labor costs of the Production, Transmission, and Distribution functions. This Labor ratio was used for all three ECOSS scenarios.

The calculation of the labor functionalization method is detailed in PREPA Ex. 8.03.

⁶ Both Maintenance and Investment Capex ratios were calculated.

189 Q. **How was the Gross Plant ratio calculated?**

190 A. The FY 2014 Gross Plant ratio was calculated from accounting information provided by
191 PREPA. General Plant, Intangibles, and Unclassified were functionalized using the
192 Labor ratio.

193 The calculation for the functionalized Gross Plant ratio is detailed in
194 PREPA Ex. 8.04.

195 Q. **How were the Maintenance and Investment Capex Functionalization Ratios**
196 **Determined?**

197 A. PREPA provided detailed Capital Expenditures (Capex) for both Maintenance and
198 Investment. Where possible, costs were directly assigned to one of the three functions
199 (Production, Transmission, and Distribution). For capex that could not be directly
200 functionalized, a ratio approach was developed based on the direct dollars from each the
201 above functions.

202 Both the Maintenance and Investment Capex Functionalization Ratio calculations
203 are shown in PREPA Ex. 8.05.

204 Q. **Were any revenue requirement items directly assigned to Tariff Classes?**

205 A. Yes, Bad Debt Expense was specifically assigned to tariff classes based on existing non-
206 payment schedules provided by PREPA⁷.

207 The development of these rates is in PREPA Ex. 8.06.

⁷ FY2015 non-payment schedules were used for FY2017 scenarios.

208 Q. **Has a summary of the resulting Functionalized Revenue Requirements been**
209 **prepared?**

210 A. Yes. PREPA Ex. 8.07 provides the results of the Functionalized Revenue Requirements
211 for Scenario 1. Schedules G-6B and G-6C provide the results for Scenarios 2 and 3,
212 respectively.

213 **B. Classification of the Revenue Requirement**

214 Q. **Please identify which PREPA utility classifications are used in the ECOSS.**

215 A. As described in Figure 1, the ECOSS spreads costs into the following functions:
216 Production, Transmission, and Demand. Classification further separates costs into
217 services that a utility provides.

218 Specifically, Production was split into two: Production Energy and Production
219 Demand. Transmission was assigned wholly to Transmission Demand, as all
220 Transmission costs are demand-related.

221 Distribution was split multiple ways: Primary and Secondary Demand, Secondary
222 only Demand, Customer, Public Lighting, Contributions, and Other Income.

223 Q. **How was the Classified Revenue Requirement developed?**

224 A. Each element of the Revenue Requirement was reviewed and assigned to a specific class.
225 For elements that do not clearly belong to a single class, one of the following approaches
226 were used: Purchased Power Classification Factor, Labor Ratio, Gross Plant Ratio,
227 Maintenance Capex, or Investment Capex. The approaches used are shown in
228 PREPA Ex. 8.08, discussed in the following questions, and referred to hereafter as
229 Classification Methods.

230 Q. **How was the Purchased Power Classification Factor Developed?**

231 A. PREPA provided FY 2014 split of purchase power by energy and demand costs based on
232 a review of the invoices from AES and EcoElectrica, which was reviewed by Navigant.
233 The resulting split is shown in PREPA Ex. 8.09.

234 Q. **How was the Classification Labor Ratio Calculated?**

235 A. In order to calculate the Classified Labor Ratio, we first developed Production,
236 Transmission, and Distribution Plant Ratios that did not include General Plant. Each of
237 the Plant-In-Service dollars was directly assigned to the appropriate function, and is
238 shown in PREPA Ex. 8.10.

239 These ratios are then used on all Labor costs to determine the Classification Labor
240 Ratio, as shown in PREPA Ex. 8.11.

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241 Q. **How were the Gross Plant Classification Ratios Calculated?**

242 A. The Classification Gross Plant Ratios were determined by assigning Plant In Service
243 costs directly to one of the classifications. For Distribution Plant-In-Service, specific
244 ratios were determined in order to separate between Primary/Secondary and Secondary-
245 Only Distribution Demand Classifications. In order to continue the approach used for
246 functionalization, the labor ratio was used for all General Plant, Intangible, and
247 Unclassified costs.

248 The development of the Gross Plant Classification Ratios is shown in PREPA
249 Ex. 8.12.

250 Q. **How were Hydro Plant-In-Service costs classified?**

251 A. Hydro was classified as 100% Production Energy.

252 Q. **How were the Classified Maintenance and Investment Capex Ratios Calculated?**

253 A. We continued the approach used for capex within Functionalization and created ratios for
254 both Maintenance and Investment. Where possible, costs were directly assigned to one
255 of the four Classifications (Production Demand, Transmission Demand, Distribution
256 Demand – Primary/Secondary, and Distribution Demand – Secondary Only). For capex
257 that could not be directly classified, a ratio approach was developed based on the direct
258 dollars from each the above classifications.

259 Both the Maintenance and Investment Capex Classification Ratio calculations are
260 shown in PREPA Ex. 8.13.

261 Q. **How did you separate Primary and Secondary Distribution Revenue Requirements?**

262 A. PREPA's plant accounting information does not maintain distribution plant for primary
263 and secondary voltages. However, the PREPA planning department provided Navigant
264 with a ratio of 59.5% for Primary and 40.5% for Secondary, which was subjectively
265 determined for distribution costs that were not directly assigned to secondary voltage
266 (i.e., line transformers).

267 Q. **What are the Results of the Classification process?**

268 A. Yes. PREPA Ex. 8.14 provides the results of the Classified Revenue Requirements for
269 Scenario 1. Schedule G-6B and Schedule G-6C provide the results for Scenarios 2 and 3,
270 respectively.

C. Allocation of the Revenue Requirement

Q. Please identify which Allocation Factors were used for PREPA's ECOSS.

A. Schedule G-5A identifies the Allocation Factors that were used in the ECOSS analysis for each of the Classification Categories.

Q. Please describe how the Allocation Factor Energy Requirements was used and calculated.

A. Energy Requirements was based on each of the scenario's fiscal year electricity or energy sales to Tariff Class adjusted for utility system losses and at a common voltage level. The Energy Requirement allocation factor was used to spread those Revenue Requirement items that were classified as Production Energy or Other Income. Schedule G-5B shows the development of the A&E Demand Allocator.

Q. Were the energy and demand cost allocation data by Tariff Class adjusted for PREPA Efficiency by Voltage Level commonly referred to as utility system losses?

A. Yes. Because some energy and power is lost in the process of transmitting and distributing electricity to customers, the amount of usage that is recorded at a customer meter is less than the amount of energy, power, and capacity that is required at the production and transmission levels. The amount of system losses is greatest for customers that take delivery service at the secondary voltage levels, and somewhat less for customers at primary, and transmission levels, respectively. For FY 2014, PREPA provided Navigant the Efficiency by Voltage Level shown in Table 1.

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291 Table 1: PREPA System Efficiency by Voltage Level

PREPA System Efficiency By Voltage Level		
Voltage Level	PREPA Efficiency	Utility System Losses (%)
Transmission	95.00%	5.00%
Primary	85.86%	14.14%
Secondary	81.37%	18.63%

292 Q. **Did PREPA have sufficient Coincident Peak (“CP”) load data by Tariff Class to be**
293 **used as an allocation factor for assigning Production Demand and Transmission**
294 **Demand?**

295 A. No. PREPA has limited coincident peak load data by Tariff Class. Navigant
296 investigated the extent that PREPA’s metering systems (identified as MV90) collected
297 hourly load data. Navigant found that PREPA’s load research information was
298 insufficient for ECOSS purposes for most of the Residential and Commercial Tariff
299 classes.

300 Table 2 summarizes for FY 2014 the monthly PREPA System Peaks date and
301 hour and quantifies the monthly amounts of coincident peak load data collected by the
302 existing MV90 hourly meters operating during FY 2014.

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Table 2: Summary of PREPA MV90 Data Explaining Monthly System Peak

Line No.	Year	Month	Date	Hour	PREPA SYSTEM PEAK (MW)	Sum of MV90 Recorded Peak (MW)	% Explaining System Peak Contribution from MV90 Meters
1	2014	6	26-Jun-14	22	2,964.0	365.9	12.35%
2	2014	5	01-May-14	21	2,821.0	397.6	14.09%
3	2014	4	29-Apr-14	21	2,878.0	396.3	13.77%
4	2014	3	26-Mar-14	21	2,852.0	417.1	14.63%
5	2014	2	10-Feb-14	20	2,707.0	410.2	15.15%
6	2014	1	22-Jan-14	20	2,739.0	426.3	15.56%
7	2013	12	10-Dec-13	20	2,822.0	401.0	14.21%
8	2013	11	12-Nov-13	20	2,946.0	440.9	14.96%
9	2013	10	01-Oct-13	21	3,057.0	417.4	13.65%
10	2013	9	25-Sep-13	21	3,159.0	434.9	13.77%
11	2013	8	15-Aug-13	21	3,122.0	445.7	14.28%
12	2013	7	29-Jul-13	21	2,970.0	410.5	13.82%

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304 Q. **Given the absence of FY 2014 CP data, what alternative allocation factor method**
 305 **was used to assign Production and Transmission Fixed Revenue Requirement costs**
 306 **to Tariff Class?**

307 A. The Average and Excess ("A&E") Demand allocator was used to assign Production
 308 demand-related cost responsibility to Tariff Classes.

309 For Transmission Demand, the tariff class PPBB⁸ was excluded from any cost
 310 allocation as both PPBB customers are served at bus-bar voltage.

311 Q. **Please explain how the Average and Excess Demand Allocator was computed?**

⁸ PPBB stands for Power Producers at Bus Bar, and specifically serves AES and EcoElectrica.

312 A. Navigant relied upon PREPA recorded FY 2014 data to compute the A&E Demand
313 Allocator by Tariff Class.

314 The A&E Demand allocator is the sum of calculated Average Demand plus
315 Excess Demand. Average Demand is calculated by applying tariff-specific load factors
316 to each of the tariff's energy sales. Excess demand is the difference between Tariff Class
317 Max NCP demand grossed up for losses minus Calculated Tariff Class NCP Demand
318 grossed up for losses and adjusted for the PREPA System correction factor of 4.00
319 percent. The 4.00 percent was computed as one minus the ratio of PREPA System Net
320 Generation divided by PREPA System Gross Generation.

321 Schedule G-5C shows the development of the A&E Demand Allocator.

322 Q. **Please describe how the NCP Demand (Primary and Secondary) allocator was used**
323 **and calculated.**

324 A. Distribution demand related costs which cannot be directly assigned are allocated to
325 Tariff Classes by the maximum monthly NCP adjusted for losses at a common voltage
326 level. PREPA Tariff Classes who receive utility service at Transmission voltage were not
327 allocated any Distribution Revenue Requirement. For those Tariff Classes who received
328 electric utility service at either Primary or Secondary delivery, the NCP was based on the
329 Tariff Classes highest monthly demand regardless of when those demands occurred
330 relative to the time of PREPA's system peak.

331 Schedule G-5D demonstrates the development of the NCP Allocator for both
332 Primary/Secondary and Secondary only Distribution Demand costs.

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333 Q. **Please describe how the NCP Demand (Secondary) allocation factor was used and**
334 **calculated.**

335 A. Distribution equipment and facilities that serve only secondary voltage customers were
336 allocated by NCP excluding all primary and transmission voltage Tariff Classes. The
337 NCP Demand (Secondary) allocation factors includes losses and includes line
338 transformers, services, and secondary voltage overhead or underground conductors and
339 devices.

340 Q. **Please describe how the Client allocation factor was used and calculated.**

341 A. Customer costs are allocated by a weighted client. A weighing approach was adopted as
342 an average residential customer generally uses less customer-related facilities (i.e., an
343 individual residential customer does not have nearly the same billing expense as a large
344 industrial customer). The weighing factor chosen was meter costs, as meter costs for
345 larger customers are higher than for smaller customers.

346 PREPA provided typical meter costs for each of the tariff classes, and the ratio
347 developed is shown in Schedule G-5E. Tariff GRS-112 was selected as the basic meter
348 cost and other meter costs were ratios of the GRS-112. GRS-112 was used as it is the
349 largest residential customer class.

350 Q. **Please describe how the Energy Supporting Public Lighting allocation factor was**
351 **used and calculated.**

352 A. Lighting equipment and facilities that serve only Public Lighting were allocated using the
353 Energy Supporting Public Lighting allocator. This allocation factor is based on a subset
354 of the Energy Requirements described above with only the tariffs eligible for Street

355 Lighting being allocated that cost category. Each eligible tariff is allocated based on the
356 adjusted energy use of that tariff over the total system eligible energy for Street Lighting.
357 Schedule G-5F depicts the development of the Public Lighting allocation factor.

358 Q. **Please describe how the Sales at Meter allocation factor was used and calculated.**

359 A. The Sales at Meter allocation factor was used to spread those FY 2014 Revenue
360 Requirement items that were functionalized and classified as Contributions. The Sales at
361 Meter allocation factor was prepared using the FY 2014 energy Sales at meter by Tariff
362 Class, (not adjusted for utility system losses). Schedule G-5G shows the development of
363 the Sales at Meter allocation factor.

364 D. **Results of the Cost of Service Study**

365 Q. **What are the results of the ECOSS?**

366 A. The results of the ECOSS for Scenario 1 are shown in Schedule G-1. The results for
367 Scenario 2 and Scenario 3 are presented in Schedules G-6B and G-6C, respectively.

368 Q. **Does this conclude your testimony?**


369 A. Yes, it does.

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ATTESTATION

Affiant, Ralph Zarumba, being first duly sworn, states the following:

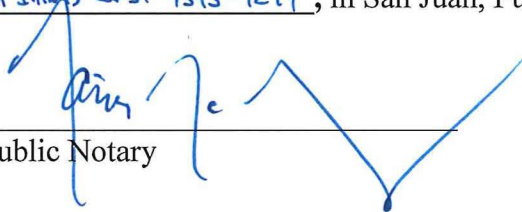
The prepared pre-filed Direct Testimony and the Schedules and Exhibits attached thereto and the Schedules I am sponsoring constitute the direct testimony of Affiant in the above-styled case. Affiant states that he would give the answers set forth in the pre-filed Direct Testimony if asked the questions propounded therein at the time of the filing. Affiant further states that, to the best of his knowledge, his statements made are true and correct.



Ralph Zarumba

Affidavit No. 3,576

Acknowledged and subscribed before me by Ralph Zarumba, of the personal circumstances above mentioned, in his capacity as Director of Navigant Consulting, Inc., who is personally known to me or whom I have identified by means of his driver's license number from Illinois 2651-7345-9297, in San Juan, Puerto Rico, this 26th day of May 2016.



Public Notary



EXENTO PAGO ARANCEL
LEY 47
4 DE JUNIO DE 1982

ATTESTATION

Affiant, Eugene Granovsky, being first duly sworn, states the following:

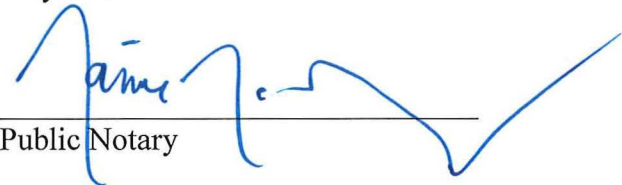
The prepared pre-filed Direct Testimony and the Schedules and Exhibits attached thereto and the Schedules I am sponsoring constitute the direct testimony of Affiant in the above-styled case. Affiant states that he would give the answers set forth in the pre-filed Direct Testimony if asked the questions propounded therein at the time of the filing. Affiant further states that, to the best of his knowledge, his statements made are true and correct.



Eugene Granovsky

Affidavit No. 3,577

Acknowledged and subscribed before me by Eugene Granovsky, of the personal circumstances above mentioned, in his capacity as a Managing Consultant at Navigant Consulting, Inc., who is personally known to me or whom I have identified by means of his driver's license number from Illinois 6651-2008-4214, in San Juan, Puerto Rico, this 26th day of May 2016.



Public Notary



EXENTO PAGO ARANCEL
LEY 47
4 DE JUNIO DE 1982