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

IN RE: THE UNBUNDLING OF THE ASSETS OF THE PUERTO RICO ELECTRIC POWER AUTHORITY	**CASE NO.:** NEPR-AP-2018-0004 **SUBJECT:** May 18 Initial Technical Hearing Presentation

MOTION TO SUBMIT PRESENTATION PROJECTED DURING THE MAY 18, 2021 INITIAL TECHNICAL HEARING

TO THE HONORABLE PUERTO RICO ENERGY BUREAU:

1. On February 5, 2021, the Puerto Rico Energy Bureau of the Public Service Regulatory Board (the "Energy Bureau") issued a *Resolution and Order* setting the procedural calendar for the case of caption. The procedural calendar established that the Initial Technical Hearing would be held today, May 18, 2021 (the "Technical Hearing").

2. The Energy Bureau entered a Bench Order during the Technical Hearing directing the Puerto Rico Electric Power Authority (the "Authority") to submit the presentation projected today to have a complete record.

3. In compliance with the Bench Order, the Authority hereby submits its presentation titled *Unbundled Rates for Wheeling-Initial Technical Hearing* dated May 18, 2021. Exhibit A.

WHEREFORE, the Authority respectfully requests the Energy Bureau to note the Authority's compliance with the Bench Order.

RESPECTFULLY SUBMITTED.

In San Juan, Puerto Rico, this 18th day of May 2021.

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CERTIFICATE OF SERVICE

It is hereby certified that, on this same date, I have filed the above motion with the Office of the Clerk of the Energy Bureau using its Electronic Filing System at https://radicacion.energia.pr.gov/login, and a courtesy copy of the filling was sent via e-mail to hrivera@oipc.pr.gov, ramonluisnieves@rlnlegal.com; manualgabrielfernandez@gmail.com; ccf@tcm.law.

In San Juan, Puerto Rico, this 18th day of May 2021.

/s Joannely Marrero Cruz
Joannely Marrero Cruz

Exhibit A

Guidehouse

Unbundled Rates for Wheeling

Initial Technical Hearing

PUERTO RICO ENERGY BUREAU

Puerto Rico Electric Power Authority

May 18, 2021

Purpose and Agenda

Purpose:

- Per Resolution and Order issued February 5, 2021, related to Case No. NEPR-AP-2018-0004, PREPA is required to attend this Initial Technical Hearing to present the proposed unbundled rate.
- To meet these requirements, PREPA's consultant, Guidehouse, has prepared the following materials and will discuss the filing.

Agenda:

- Introduction
- Cost of Service Results
- Unbundled Tariff Results
- Uniform Services Agreement
- Request

Introduction

- In response to the PREB Order on February 5th, PREPA filed three reports on May 10th:
  - Marginal Cost of Service
  - Unbundled Tariff Design
  - Uniform Wheeling Services Agreement (UWSA)
- PREPA supplemented these reports with the Prepared Testimony of Margot Everett and a revised Default Unbundled Tariff Sheet per PREB's Motion for Compliance filed on May 13th.
- These reports were developed based on the frameworks that were reviewed at the technical conferences on March 15th and April 15th.
- In many places, the numbers referenced in these reports are "indicative" due to data constraints. However, the tariff design framework and UWSA framework are sustainable, in that they provide placeholders for refined numbers as data become available and more robust over time.
- Today's presentation does not focus on the UWSA framework as that was discussed in detail at the last technical conference; however, the material is in the appendix for reference if needed.

Cost of Service Results

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Marginal Cost Results - Capacity

Generation Capital by Year

by Category ($000)

Year	Load Growth	Restoration	Resilience	Lifecycle Replacement	Policy	Total
2021	0	17	0	0	0	17
2022	0	7,200	49,000	0	0	56,200
2023	0	34,872	330,500	0	0	365,372
2024	0	139	0	0	0	139
2025	0	74,595	280,800	0	0	355,395
2026	0	49,200	0	0	0	49,200
2027	0	3,383	5,000	0	0	8,383
2028	0	238,343	572,400	0	0	810,743
2029	0	11,178	0	0	0	11,178
Total	0	418,926	1,237,700	0	0	1,656,626

Marginal Cost of Service Study Results

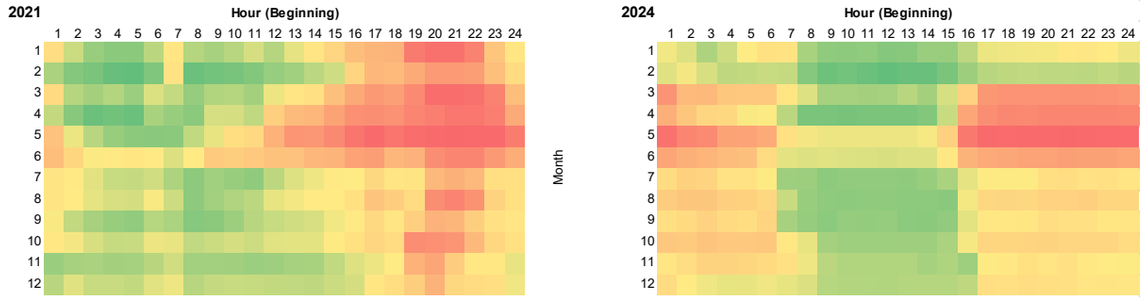
	Generation Capacity	Energy	Transmission Capacity	Distribution Capacity	Other*
	($/kW)	($/kWh)	($/kW)	($/kW)	($/kW)
Marginal Cost	0	0.05127	0	0	0

- PREPA's cost of service (COS) study filing examined the incremental, or marginal, costs of supplying or delivering energy to a customer.
- First, the COS examined capacity costs related to generation, transmission and distribution services.
- PREPA used the Discounted Total Investment Method (DTIM) to quantify marginal costs. This had several benefits:
  - Forward looking, based on planned investments that can be avoided
  - Smooth out timing of capital versus load
- The results of this study show that, due to declining load, plans for capital spending for generation capacity, as well as transmission and distribution, is zero.
- As a result, marginal capacity costs are zero for the foreseeable future for all functions.

Marginal Cost Results - Energy

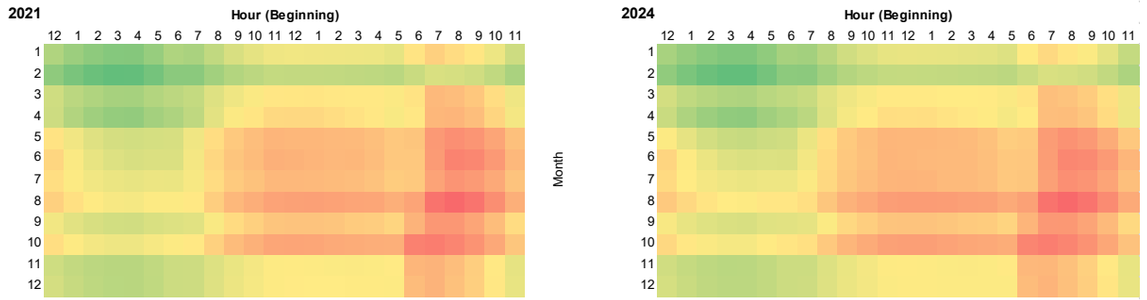
- PREPA also examined marginal energy costs, which are costs related with the generation of an incremental kWh every hour of the year.
- PREPA has historically used Aurora, an industry accepted production cost model to determine marginal energy costs for each hour.
- Results are highly sensitive to assumptions on load, generation availability and generation maintenance schedules.
- Because of the relationship between load and marginal energy costs, the expectation is that the profile of marginal costs would be consistent with the load profile.
- Given the disconnect between PREPA's forecasted marginal energy costs from Aurora and system load, an embedded cost-based proxy was used to estimate the marginal energy cost (MEC).

Load Weighted Marginal Energy Costs, 2021 and 2024



	2021	2022	2023	2024
Weighted MEC ($/kWh)	0.0692	0.0873	0.0816	0.0838

System Load Heat Maps, 2021 and 2024

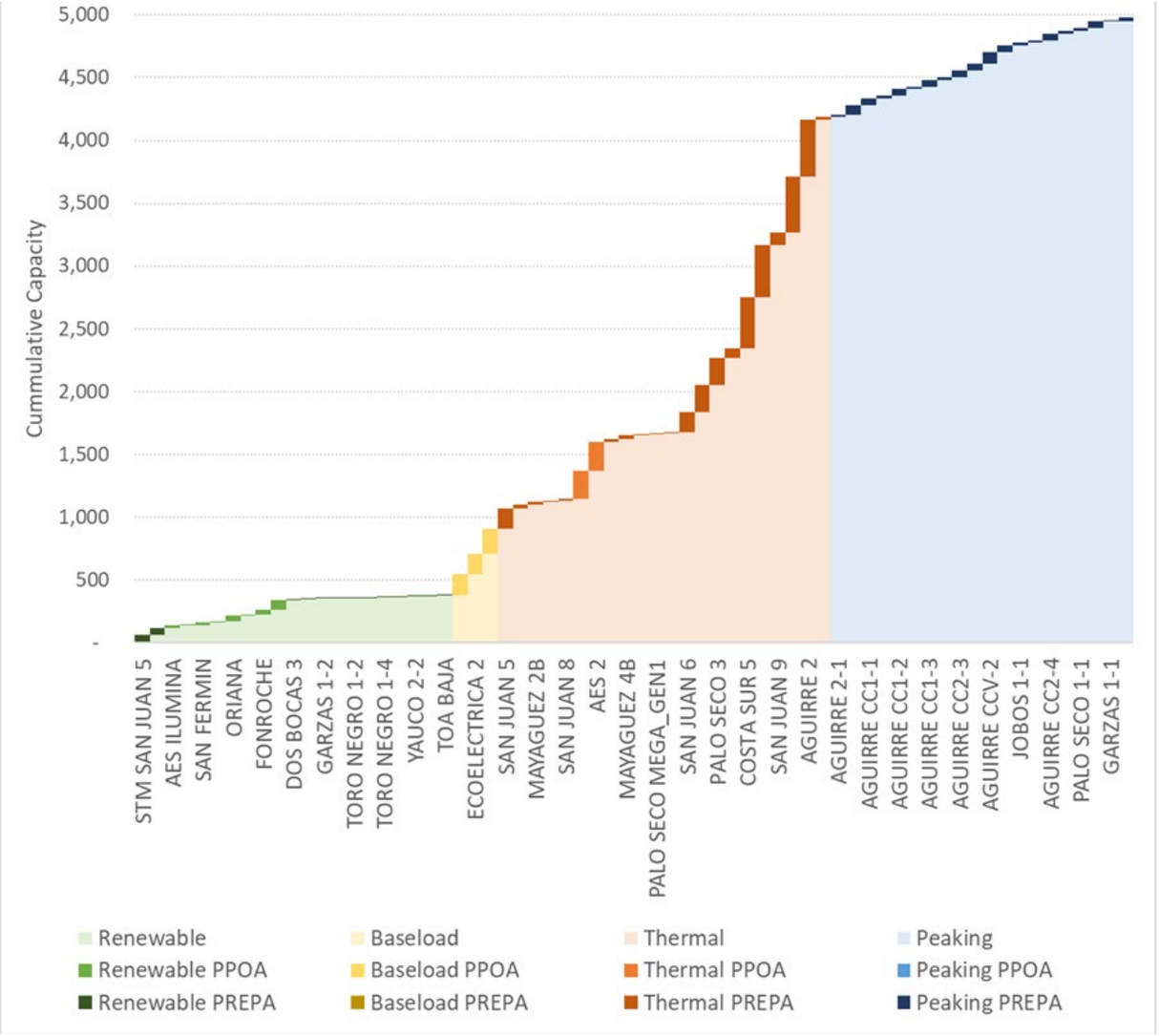


Marginal Cost Results – Marginal Energy Cost Proxy

Marginal Energy Cost Proxy

- To develop a MEC proxy, PREPA examined the supply stack using generation capacity and heat rates, as individual plant cost data are not available.
- Generation was divided into four categories:
  - Renewable
  - Baseload
  - Thermal
  - Peaking
- Next each category was further subdivided by type of asset, Purchase Power Operating Agreement (PPOA) or Utility Owned (PREPA)
- PREPA then compared the supply stack with the highest (~2,900 MW) and lowest (~1,200 MW) annual load, showing that thermal, and possibly peaking, is used on the margin for every hour.

PREPA Supply Stack by Type



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Marginal Cost Results – Marginal Energy Cost Proxy

- Based on the fact that thermal and peaking plants would be used for marginal costs, then those costs should be what is included in the marginal energy costs.
- Once the units were categorized by type, the capacity contribution for each unit was estimated.
- Accordingly, it was assumed that approximately 9% of PPA units and 73% of UOG units are flexible and driving marginal costs.
- These PPA and UOG allocation percentages can be applied to the PPCA and FCA costs, respectively, to calculate the "dispatchable" portion of these costs as a proxy for MEC.
- This dispatchable portion could possibly be avoided and thus the best estimate of avoidable costs.

Capacity Weighting of Generation Plants

Unit Type	PPA Units	UOG Units	Total	PPA Units	UOG Units	Total
	(MW)	(MW)	(MW)	(%)	(%)	(%)
Renewable (As Generated)	222	156	378	4%	3%	8%
Baseload Units	534	-	534	11%	0%	11%
Thermal Units	454	2,820	3,274	9%	57%	66%
Peaking Units	-	790	790	0%	16%	16%
Total	**1,210**	**3,766**	**4,976**	**24%**	**76%**	**100%**

2017 and Current FCA and PPCA Rider Costs and Rates

	PPA Units	UOG Units	Total
2017 Rates	(MW)	(MW)	(MW)
Rates	0.04748	0.06470	0.11218
Dispatchable Percentage	9%	73%	
Non-dispatchable Percentage	91%	27%	
Dispatchable Rates	0.00433	0.04694	0.05127
Non-Dispatchable Rates	0.04315	0.01776	0.06091
Check	0.04748	0.06470	0.11218
Indicative Rate (As of 3/31/21, Applied from April 2021 to June 2021)			
Rates	0.02961	0.09546	0.12506
Dispatchable Rates	0.00266	0.06968	0.07235
Non-Dispatchable Rates	0.02694	0.02577	0.05272
Check	0.02961	0.09546	0.12506

Challenges and Considerations

Cost of Service

Challenge	Description	Proposed Resolution
Data Availability	Data availability was limited. Data capture systems are not set up to collect data necessary for a detailed cost of services study. Further, forecasts are highly sensitive to assumptions that are highly uncertain, such as load growth, peak capacity needs and generation operations.	Use proxies available and encourage funding of data collection and forecasting capabilities to enhance data quality and availability
Changing Sector	Sector rules are changing, and the cost structure of the sector will be impacted by changing rules.	Continue to monitor sector progress and update COS when sector structure stabilizes (though may be still hampered by data availability challenges)

Unbundled Tariff Results

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Unbundled Tariff Results – Supply Choice Credit

Default Primary Unbundled Tariff

- PREB requested that the default tariff be equal to the Fuel Cost Allocation (FCA) and Purchase Power Cost Allocation (PPCA) factors
- However, these costs include PPA's and other resources that are not dispatched based on price, specifically renewable and baseload plants are typically dispatchable and their costs are related to contractual terms that include capacity.
- Further, these costs are not well defined at this time and thus difficult to segment.
- Lastly, marginal capacity costs are zero today but could be positive in the future and EPS supply could provide additional avoided costs that should be included in the supply credit.
- As a result, PREPA refiled the Default Supply Choice Credit that will allow for changes in assumptions regarding the level of costs and integration of additional information

- PREPA proposes the tariff be a Marginal Energy Costs (MEC) as well as Marginal Generation Capacity Cost (MGCC) as a function of the Avoided Capacity Contribution (ACC).
- MEC is a function of the FCA and the PPCA based on the percent of those costs that can be considered avoidable. For the default credit, these adjustments are considered 100%
- The MGCC costs are then adjusted for the percent of capacity that can be avoided.
  - Currently the ACC is set at 0%, in part because PREPA continues to have the Provider of Last Resort (POLR) and thus always be prepared to serve a customer
  - ACC should also consider capacity costs in the FCA and PPCA

$$DSCC = \frac{MEC * Class\ Sales + MGCC * Contribution\ to\ CP * ACC}{Class\ Sales}$$

$$MEC = FCA * FCP + PPCA * PPCP$$

Unbundled Tariff Results – Supply Choice Credit

Default Primary Unbundled Tariff

- PREB requested that the default tariff be equal to the Fuel Cost Allocation (FCA) and Purchase Power Cost Allocation (PPCA) factors
- However, these costs includes resources that are not dispatched based on price, such as renewable and baseload plants, which typically “must run” or dispatched based on contractual terms that include capacity.
- These costs are not well defined at this time and thus difficult to segment.
- Marginal capacity costs are zero today but could be positive in the future and EPS supply could provide additional avoided costs that should be included in the supply credit.
- PREPA refiled the Default Supply Choice Credit that will allow for changes in assumptions regarding the level of costs and integration of additional information

$$DSCC = \frac{MEC * Class\ Sales + MGCC * Contribution\ to\ CP * ACC}{Class\ Sales}$$

$$MEC = FCA * FCP + PPCA * PPCP$$

Revised Default Unbundled Tariff

	PPCA	FCA	DSCC
2017 Rates	0.04748	0.06470	0.11218
Indicative Rate (As of 3/31/21, Applied from April 2021 to June 2021)	0.02961	0.09545	0.12506

Original Default Unbundled Tariff

	PPCA	FCA	DSCC
2017 Rates	0.04748	0.06470	
Dispatchable Rate	0.00433	0.04694	0.05127
Indicative Rate (As of 3/31/21, Applied from April 2021 to June 2021)	0.02961	0.09545	
Dispatchable Rate	0.00266	0.06968	0.07235

Unbundled Tariff Results – Supply Choice Credit

Alternative Unbundled Tariff

- The default unbundled tariff offers a simplistic approach for implementation through the application of a single rider on the standard retail rates; however, the tariff is based on the FCA and PPCA, which include prior period adjustments. This is a challenge because:
  - The adjustments can be caused by actual plant performance and customers loads, which are not avoidable.
  - The adjustments can be caused by load variability or extreme weather events, which are also not avoidable.
- To address these issues, PREPA recommends Supply Choice Credit (SCC) in the filing), where FC and PPC are defined as amended riders that do not include prior period adjustments.
- Next, FCP and PPCP are defined as the percent of capacity related to dispatchable UOG and PPAs, respectively.
- Lastly, addition of an Energy Cost True-Up (ECT) that takes the adjustments currently put into the FCA and PPCA to ensure full collection of costs.
- Lastly once a MGCC is positive, this can also be included, similarly to the DSCC

$$SCC = FC * FCP + PPC * PPCP$$

$$ECT = \frac{Prior\ Period\ Adjustments}{Applicable\ Retail\ kWh\ Sales}$$

Challenges and Considerations

Unbundled Tariff

Challenge	Description	Proposed Resolution
Sector Changes	PREPA is undergoing substantial changes in its circumstances and the electricity structure in Puerto Rico is transitioning and the final end-state is not clear	Continue to monitor sector progress and update tariff consistent with proposed unbundling framework when sector structure stabilize.
Stranded Costs & POLR Obligation	Key tariff considerations are associated with extreme load loss, decommissioning costs, RPS implications, provider of last resort provisions, system planning responsibilities, IPP capacity expansion, and potential cost variability by time of day or season	Address POLR obligation and stranded costs separately. Determine if PREPA remains POLR or if 'customer return' options should be limited. Must be integrated with policies and procedures to ensure sufficient capacity for Puerto Rico's needs.
Billing	Key operational considerations are associated with billing system adaptability, MDMS, and consumer protection	Develop a plan for implementing billing and tracking systems and finalize tariff accordingly.
Cost Shifts	There are risks of cost shifting associated with the default unbundled tariff from those who are served on the new tariff to those customers who remain with PREPA	Adopt true-up mechanisms that capture all costs and, as COS capabilities advance, update the true-up to collect these costs from the appropriate customer groups.
Customer Self-supply	Consideration for customer self-supply options, that may include distribution and transmission avoided costs, but also driving connection rules and requirements	Address customer supply separately from ESP or other wholesale providers and create clear rules on self-supply options.
Ancillary Services Costs	Addressing the costs of providing firm energy, usually provided through Ancillary Services.	Adopt true-up mechanisms that capture these costs until these services are separately measured and potential markets for these services evolve.

Uniform Services Agreement

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Uniform Services Agreement

Component	Default	Alternative
ESPC Eligibility	Required to sign the Uniform Services Agreement without alterations	Same as Default
ESPC Notification of Customer Enrollment	• ESPC notifies PREPA of a customer switching to ESPC service • Supplies accounts and meter information for each customer	Same as Default
Notification Timing	Silent	Notification occurs no less than 5 business days from the end of the customer's billing period
Transfer Timing	Silent	• Customer transitions to ESPC service at the start of their next billing period from the date of notification • If notifications by ESPC occurs within five business days of the end of the customer's billing period, the transition occurs at the end of the following month's billing period
PREPA Customer Notifications	PREPA will verify with customer that the customer has chosen to take service from the ESP and confirm the accounts and meters	Same as Default
Imbalance Provisions	• Hourly differences between supply and customer load, adjusted for losses are tracked • Positive differences (Generation > load plus losses) is credited to ESPC at 95% of the Imbalance Rate • Negative differences (Generation < load plus losses) charged to ESPC at the Imbalance Rate	Same as Default

Uniform Services Agreement

Component	Default	Alternative
Hourly Imbalance Rate	• Computation on an hourly basis from the fuel and variable O&M rate for the marginal generation unit, which would be turned up if PREPA's load were higher or turned down if PREPA's load were lower • If PREPA cannot identify the marginal generation unit or its costs, the marginal generation cost in a given hour will be deemed to be the average cost per MWh of fuel and variable O&M for steam oil plants operating at that hour	• Computation of forecasted hourly marginal costs based on IRP modeling • Variations in actual costs versus forecasted marginal costs will be computed and addressed in the True-Up Mechanism

Imbalance Performance Provisions	• Calculate the total annual imbalance as the absolute value of the difference between the generation delivered to PREPA by the EPSC and the metered load and line losses of its wheeling customers
	• An imbalance dead zone which shall be defined by year as follows:
	  ○ Year 1 = 60%
	  ○ Year 2 = 50%
	  ○ Year 3 = 40%
	  ○ Year 4 = 30%
	  ○ Year 5 and beyond = 20%
	• Performance charge based on the positive difference between 1 minus the bandwidth times total annual customer load less annual imbalance. This positive balance is then multiplied by 10% of the average fuel cost adjustment and purchased-power cost adjustment for the IPP's customers in the given year
		• Calculate the total annual imbalance as the sum of each hourly imbalance amount for the year times the Hourly Imbalance Rate
		• An imbalance dead zone which shall be defined by calendar year as follows
		  ○ 2022 = 60%
		  ○ 2023 = 50%
		  ○ 2024 = 40%
		  ○ 2025 = 30%
		  ○ 2026 and beyond = 20%
		• Performance charge based on the positive difference between 1 minus the bandwidth times total annual customer load less Annual Imbalance. This positive balance is then multiplied by 10% of the total Annual Imbalances times 1 minus the bandwidth

Uniform Services Agreement

Component	Default	Alternative
Losses Rate	For the purposes of both the hourly energy balancing provisions and the annual imbalance charge, line losses adders shall be set at the values used in the Cost of Service Study filed in Case No. CEPR-AP-2015-0001, or an updated value as available	Same as Default
Losses Adder	Silent	ESPC is responsible for scheduling supply to meet customer load plus losses as defined by the Losses Rate
Credit Terms	Letter of credit for an estimate of one month of the IPP's customers' avoided fuel cost settlement and purchased power cost adjustment	Letter of credit or cash collateral for four times the estimate of one month of the IPP's customers' avoided fuel cost settlement and purchased power cost adjustment times the credit collateral requirement percentage
Credit Rating	Silent	Provide for ESPC's credit rating by reducing credit requirements for good credit quality using "Big Three" credit ratings as follows: ○ P1 = 5% ○ P2 = 25% ○ P3 = 50% ○ Not Prime = 100%
Scheduling	Silent	ESPC is required to submit a schedule to PREPA electronically a day ahead with forecasted hourly load requirements adjusted for losses as well as hourly supply forecast

Uniform Services Agreement

Component	Default	Alternative

Ancillary Services	Silent	• Proposed charges for the following Ancillary Services:
		  ○ Scheduling
		  ○ Reactive Supply and Voltage Control
		  ○ Regulation and Frequency
		  ○ Operating Reserve – Supplemental
		  ○ Response Operating Reserve – Spinning
		• Values for each service are set to zero until such time that they can be quantified and separated from costs currently embedded in PREPA's generation costs and thus included in the supply credit and the ESPC starts to pay for these costs directly

Standby Services	Silent	• PREPA and ESPC agree to a Contract Demand level • The ESP then pays a monthly charge of the Contract Demand times Marginal Generation Capacity Cost • If actual standby services exceed the Contract Demand, Contract Demand level is automatically adjusted to equal actual demand shortfall
True-Up Mechanism	Silent	Propose tracking of actual costs versus actual revenues associated with ESPC service to customers (including imbalances) and true-up these costs annually, resulting in a credit or charge to the ESPC with an equal but opposite charge or credit to PREPA's customers

Challenges and Considerations

Uniform Services Agreement

Challenge	Description	Proposed Resolution
Sector Restructuring	Sector restructuring creates uncertainty. Namely, the creation of a GenCo that will own and operate PREPA's legacy generation assets and sell supply to PREPA could result in a change in agreements depending on the GenCo's compensation structure, role, and responsibilities, and 'transfer pricing' to PREPA.	The underlying assumption of the future structure of the sector is that there will be a GenCo that will own and operate PREPA's legacy generation facilities. Then PREPA evolves to a "GridCo" that is responsible for PREPA's legacy PPAs plus any new contracts created through RFP processes or other mechanisms where a third party sells energy to the GridCo. In this structure, energy costs would be segmented between GridCo PPAs and GenCo Legacy generators. This assumption has several implications. First, supply credits will need to be driven by both factors, and thus impact the final rates. Second, since imbalances and losses are also a function of the combined costs of the GenCo and GridCo energy costs, this cost structure also needs to be considered. Specifically: • Imbalances would be based on the incremental GridCo's costs to meet that load in any hour, regardless of source (e.g., PPA or generator). • Losses Adder would be based on the actual difference between GenCo delivered energy and metered loads. Once GenCo is established, a separate agreement between generators may be required and could drive fees in the Uniform Services Agreement. Load-related GenCo and GridCo PPA ancillary services charges will be included in PREPA's charges, while generation-related GenCo and GridCo PPA ancillary services will be charged to each generator.
Legal Terms	Terms and Conditions require legal input and review.	PREPA files Uniform Services Agreement "Term Sheet" on May 10 and conducts a series of workshops and Technical Conferences after May 10 to solicit input from both PREB and other stakeholders on actual legal terms and conditions.
Policy Compliance	Other policy and market rules, including restructuring, remain unclear and create additional uncertainty.	Emphasize an Unbundled Tariff Framework that is able to accommodate market changes. Determine who is responsible for meeting Renewable Portfolio Standard requirements and addressing unexpected costs related to plant retirements and environmental provisions, for example.

Request

- Given the significant challenges associated with the implementation of the tariff and UWSA, PREPA respectfully requests that PREB delay any decisions on this topic until the market rules are understood and PREPA can track the necessary costs and compute, on a cost basis, the necessary fees included in the proposed agreement; and until several policy issues are resolved.
- PREPA also encourages the establishment of a series of workshops with key stakeholders to draft the final legal terms of the agreements.
- Finally, if PREB's proposed redline changes are made to Regulation 9138, PREPA anticipates that such changes will most likely require changes to the proposed UWSA.
- If PREB chooses to move forward and implement the tariff and USWA, PREPA respectfully requests PREB's approval of the (1) Alternative Unbundled Tariff and (2) Alternative USWA.
- If these proposals are not adopted, PREPA requests that PREB consider components of the alternative proposals and the approval of a "hybrid" approach rather than the default.

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