



**Puerto Rico  
Electric Power  
Authority**

# **Puerto Rico Electric Power Authority**

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**Amended & Restated Fiscal Plan – Draft**

April 5, 2018

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## Executive Summary & Disclaimer on Purpose of this Submission

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- The purpose of this submission is to comply with the Fiscal Oversight and Management Board's (FOMB's) requirement to submit a further draft of the amended and restated Fiscal Plan per the notice of violation letter issued by the FOMB on February 5, 2018. Certain unknowns make submission of a fully developed Fiscal Plan challenging at this stage. Those include, but are not limited to:
  - Lack of visibility regarding the availability and terms of federal funding for the restoration and rebuilding plan
  - The impact of the recent catastrophic hurricanes resulting in limited visibility as to expected recovery and revenue collections and the longer term repopulation of the island
  - Need for a new IRP to reassess needs under a new set of load scenarios to achieve long-term goals of system reliability, fuel diversification, and renewables integration
  - The impracticality of tying the FY2019 budget to the Fiscal Plan at this stage
  - Uncertainty as to load forecast given continuously shifting views on macroeconomic indicators
  - Limited information regarding future macro resource planning
- PREPA's amended and restated Fiscal Plan is premised on a transformation of Puerto Rico's energy sector in a transaction that will take at least 18-months. The ultimate form of the transformation will be informed by many elements currently unknown and beyond PREPA's control including market appetite for the transaction and legislative action. PREPA, therefore, expects to amend and modify this Fiscal Plan to reflect the inputs received from the transformation process.
- Puerto Rico's ability to execute on the transformation of the energy sector and the ultimate structure of any such transformation may be impacted by the amount, structure, terms and conditions of the federal funding available to support the transformation.
- To meet the requirements of the FOMB, PREPA has also included a plan in which PREPA continues to operate during the Transformation period while driving cost-saving initiatives under the Fiscal Plan. In the event the transformation does not occur as planned, PREPA anticipates this Fiscal Plan would require additional amendment.
- Certain elements of the transformation of the energy sector in Puerto Rico such as the development and implementation of a new regulatory scheme will occur outside of PREPA. PREPA has addressed those elements in the Transformation Section of this Fiscal Plan but notes that these will also be part of an overall sector transformation contemplated in the Government Fiscal Plan.
- This submission is a draft for all intended purposes. PREPA and the Government of Puerto Rico reserve the right to make revisions and changes as necessary, at their entire discretion.

# Summary of PREPA’s Fiscal Plan Development

## A Deliberate Process Leading to the Transformation of the Energy Sector Outside of PREPA

	Fiscal Plan certified	FY18 budget certified	Title III filed	Fiscal Plan revisions and amendments	Transformation Plan*	Exit from Title III (Plan of Adjustment)
<b>Timeline</b>	April 28, 2017	June 30, 2017	July 2, 2017	May – Sep 2017	Aug – March 2018	TBD, 2018-2019
<b>What</b>	<ul style="list-style-type: none"> <li>Financial Oversight and Management Board for Puerto Rico (FOMB) certified PREPA Fiscal Plan for FY17-26 subject to amendments, including achieving a 21 cent per kWh target rate by 2023</li> </ul>	<ul style="list-style-type: none"> <li>PREPA submitted its FY2018 budget, which the FOMB approved and certified, subject to reconciling and agreeing their requirements for a revised Fiscal Plan with amendments</li> </ul>	<ul style="list-style-type: none"> <li>FOMB filed a voluntary petition under Title III of PROMESA in the United States District Court for the District of Puerto Rico</li> </ul>	<ul style="list-style-type: none"> <li>PREPA continued to revise its Fiscal Plan in close coordination with the FOMB</li> <li><b><i>Impact of hurricanes Irma and Maria affected fiscal plan assumptions and objectives</i></b></li> </ul>	<ul style="list-style-type: none"> <li>Working team established to develop operational and regulatory transformation plan</li> <li><b><i>The FOMB established revised deadlines (March 2018)</i></b> to submit an amended Fiscal Plan based on certain principles set forth in letter of December 12<sup>th</sup>, 2017 and updated macro – assumptions and other data</li> </ul>	<ul style="list-style-type: none"> <li>Determination of amount and terms of federal funds available to support transformation of energy sector</li> <li>Plan of adjustment contemplating transfer of certain of PREPA's assets approved by the Federal District Court</li> </ul>

# I. Governance & Implementation

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# Fiscal Plan Implementation

## Historical Challenges

- For reasons within and outside of its control, PREPA has historically been unable to implement a business plan that leads to the lowest possible energy rates for Puerto Rico's ratepayers or achieve compliance with environmental regulations, while ensuring reliability and power quality.

## Transformation

- On January 23<sup>rd</sup>, the Governor of Puerto Rico announced the plan to radically shift from the current energy sector model by enacting deep energy sector reform that fully leverages private market expertise, know-how and investment in order to promote the lowest possible rates and compliance with applicable environmental regulations.

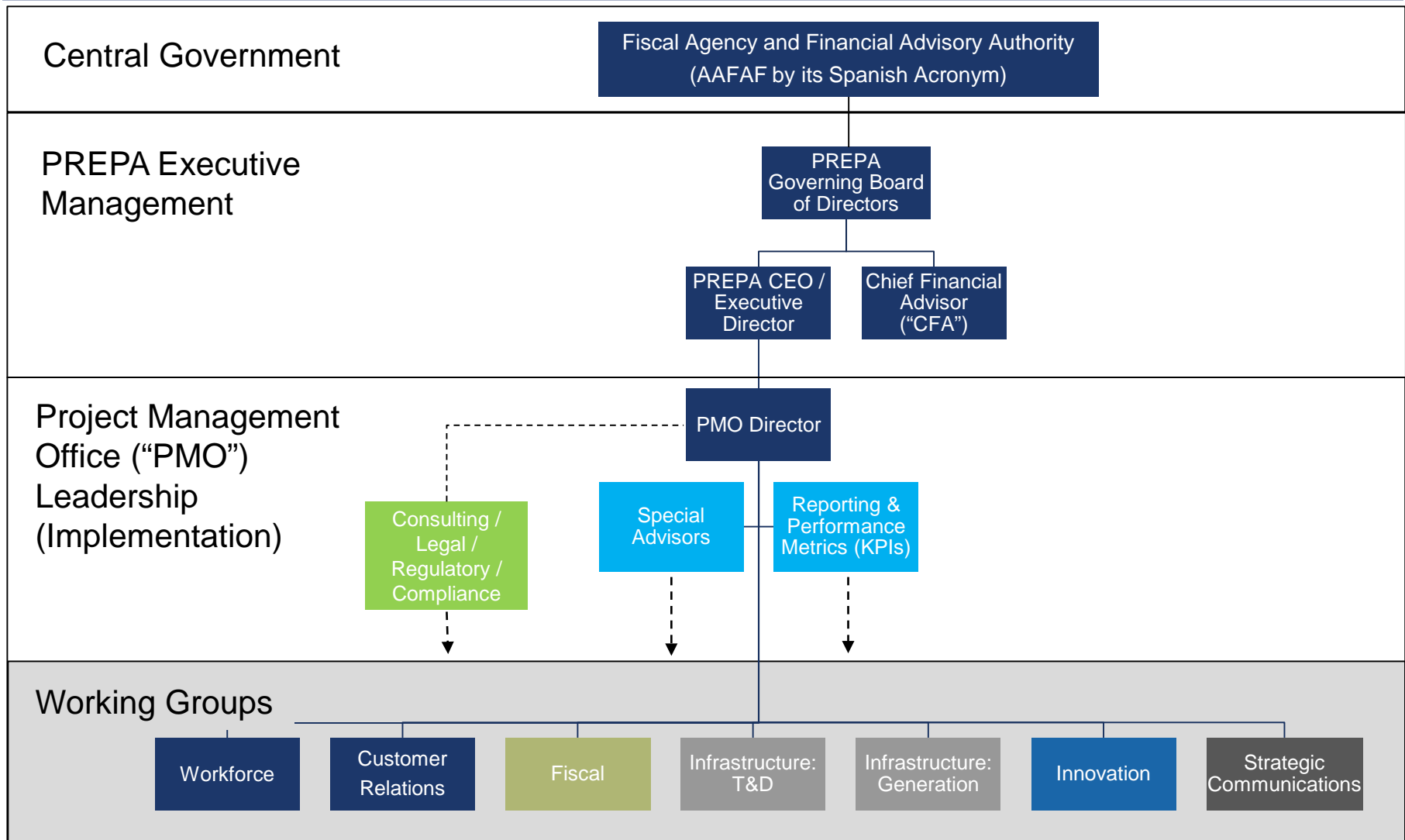
## Recovery

- As part of the energy sector reform, the Government of Puerto Rico intends to put in place safeguards and rate regulation to protect ratepayers and ensure the development of a world class energy system via the establishment of the appropriate regulatory framework (i.e., with clear and transparent KPIs, targets and milestones, including right-sizing operational costs for the new demand environment; delivering projects efficiently across asset planning, procurement, and construction; and lowering long term maintenance costs while increasing reliability through predictive maintenance strategies).

## Market Participation

- The base case for the transformation of the electric sector in Puerto Rico is anticipated to involve a sale of the existing generation assets, development of new generation and a concession by the public entity of the T&D System. PREPA expects this structure to be tested against the market.
- Puerto Rico's ability to execute on the transformation of the energy sector and the ultimate structure of any such transformation may be impacted by the amount, structure and terms of the federal funding available to support the transformation.

# Governance Structure: Restructuring at PREPA until Energy Sector Transformation



\*On March 20<sup>th</sup>, 2018, the PREPA Board of Directors announced the replacement of the Executive Director with the appointment of a CEO



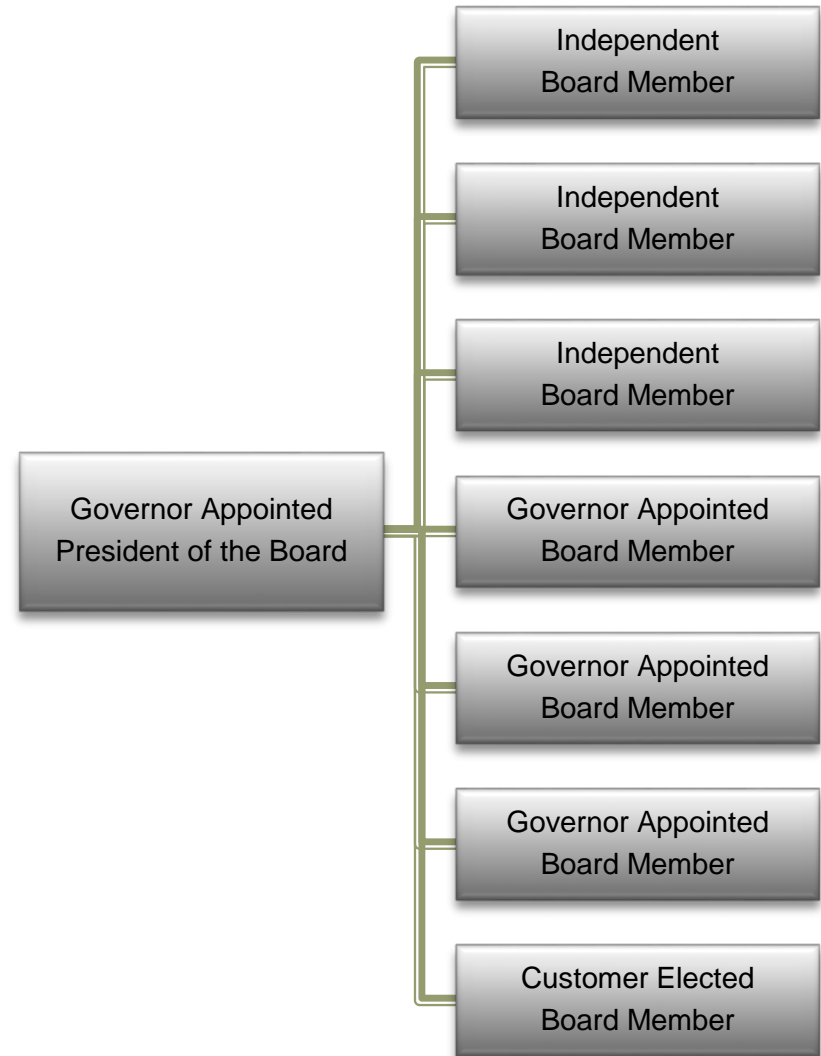
# Governing Board

## Board Composition:

- Similar to the Senior Management of the Company, the Governing Board of PREPA is made up of individuals who have served for less than one year in their current positions
- The Governing Board consists of eight members, with one current vacancy for a customer representative that will be filled in an upcoming public election
- BOD composition includes a mix of Governor appointees and politically independent members
- ***Four of the five BOD committees are chaired by an independent member and/or constitute a majority of the committee***, including the Finance and Audit Committee which is exclusively composed of independent members

## Current Focuses Include:

- Power restoration and recovery
- Near-term liquidity challenges spawned by recent storms
- Improving PREPA's overall transparency and credibility
- Enhancing internal human capital capabilities and business processes
- Transformation Plan for Puerto Rico's Energy Sector



# PREPA Governing Boards' Vision for the future of power in Puerto Rico

Development of a long-term transformation execution plan, with the goal of not just emerging from bankruptcy and restoration of power, but establishing a model for power generation and delivery that sets a global example for cost, resilience, sustainability, customer engagement and empowerment.

## System is Customer-Centric

- ▶ The system serves the customer with affordable, reliable power, with transparent metrics for quality of service and with equitable consideration across all customers. Quality/Reliability can be differentiated for customers in a manner that serves their total cost and risk objectives. Customers are engaged by innovative products and value added services that provide choice among rate plan and risk management options, and provide access to wholesale contracting options for large customers. Customers are empowered with behind-the-meter alternatives for energy efficiency, demand management, and distributed generation, with the ability to become prosumers if they so choose.

## System Promotes Financial Viability

- ▶ The system is premised on positive economics on both sides of the meter. Rates are reasonable and create value for the customer, while pricing is sufficient to cover costs. Rate and market design create incentives to purchase, consume or produce energy in a manner that benefits the entire system. Subsidies are minimized, and those that remain have a non-distortionary impact. Operational excellence and sound long term planning reduce the cost to serve. Rates are affordable within a model that allows the utility to earn a reasonable rate of return and service its debt. The business model is robust to changes such as outmigration and reduction in energy demand, and does not create disincentives for adoption of cheaper energy resources, either at the grid level or at the customer premises.

## System is Reliable and Resilient

- ▶ The grid is thoughtfully planned, well maintained and safely operated to achieve defined reliability and resiliency goals. There is visibility into the system at all levels, and control where appropriate. Standards for recoverability create a measure for resilience. The choice of architecture (distributed vs. regionalized vs. centralized) is intentionally made to balance reliability/resilience and cost objectives while also taking advantage of advancements in technology and innovation.

## System is a Model of Sustainability

- ▶ There is a progressive focus on diversifying energy resources and reducing the carbon intensity of the power sector, in both primary generation and backup generation. Power generation is efficient and minimizes emissions. Customers have incentives to use energy wisely and to generate their own clean energy. The grid and grid systems are designed to take maximum advantage of increasingly cost effective renewable power generation alternatives and to integrate emerging technologies.

## System Serves as an Economic Growth Engine for Puerto Rico

- ▶ The quality, reliability, and cost of power attracts new commercial and industrial development to Puerto Rico, and encourages existing commercial and industrial customers to expand their operations. Transformation and reinvestment in the power system creates new jobs. Innovation in the generation and delivery of power creates a local ecosystem of businesses that provide for evolving needs for equipment, technology and services in Puerto Rico and beyond.

## Recent Actions by Governing Board to Assist Until Sector Transformation

<p><b>CEO Appointment</b></p>	<ul style="list-style-type: none"> <li>▪ On March 20th, 2018, PREPA’s governing board announced the appointment of Walter M. Higgins as PREPA’s first-ever non-politically appointed CEO</li> <li>▪ Higgins comes to PREPA with more than 40 years of top management experience, including: Sierra Pacific Resources (SPR) (now known as NVEnergy); AGL Resources and Atlanta Gas Light Company, notably the first deregulated natural gas utility in the United States; Louisville Gas and Electric Company; and Portland General Electric Company.</li> </ul>
<p><b>Chief Financial Advisor (“CFA”)</b></p>	<ul style="list-style-type: none"> <li>▪ On December 1, 2017, the Governing Board announced the retention of Todd W. Filsinger of Filsinger Energy Partners, as CFA. Mr. Filsinger has been active in the energy sector for over 25 years and is recognized globally as a leader and turn-around specialist in the energy sector, involved with major industry restructurings such as Calpine and Energy Future Holdings</li> <li>▪ Responsibilities include developing and supporting ongoing financial and operational restructuring efforts, advancing the transformation process, budgeting responsibility, expense approvals, fiscal and transformation plan implementation, and interaction with the FOMB and other stakeholders.</li> <li>▪ The CFA reports directly to the Governing Board and will have independent oversight of PREPA financial matters and broad responsibilities over the financial aspects of operations</li> </ul>
<p><b>Director for Strategic Transformation Initiatives (“PMO Director”)</b></p>	<ul style="list-style-type: none"> <li>▪ Established by Governing Board Resolution in 2017 to lead the Project Management Office (PMO)</li> <li>▪ Develop clear &amp; specific policy rationales for project prioritization, implementation and timelines</li> <li>▪ Manage and supervise working groups, internal staff, special advisors, external resources</li> <li>▪ Develop and publish relevant transformation metrics and KPIs, and prepare reports with assistance from Special Advisors &amp; Working Group Leads</li> <li>▪ Oversee engagement with external stakeholders and promote internal (PREPA) stakeholder engagement and transparency to ensure PREPA meets transformation schedules</li> </ul>
<p><b>Transformation Advisory Council (TAC)</b></p>	<ul style="list-style-type: none"> <li>▪ December 11, 2017: Governing Board named 11 utility industry leaders to serve as TAC members</li> <li>▪ Recognizing that PREPA’s expertise in the energy sector is valuable in planning for the sector transformation, the TAC was formed to provide the Governing Board and management with advice on developing a long-term vision and transformation execution plan for the island’s power system</li> </ul>

## Recent Actions by Governor / AAFAF for Transparency & Sector Transformation

### Office of Contract Procurement and Compliance (OCPC)

- Established through Executive Order 2017-66, November 2017 (See next slides)
- Mission is to ensure compliant and efficient PREPA procurement to support recovery, restoration of power and rebuilding of energy grid
- All qualifying PREPA procurements of over \$500K are reviewed and approved by OCPC prior to final action
- Independent review with technical experts to confirm contracts and procurement are compliant with local and federal laws and regulations
- Implement procurement process controls and procedures to mitigate compliance risk, limit potential de-obligation risk and enhance accountability
- Implement process enhancements including automation and integration, monitoring and reporting to increase transparency, accountability and effectiveness

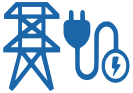
### Transformation & Privatization

- Private-Public Partnership Act Amendment (filed Puerto Rico House / Senate on March 6, 2018)
- Regulatory structure modifications under development
- 18 month transformation and privatization process: Preparation / Market Process / Closings

# The Transformation Plan is Intended to Provide a Roadmap for a Transformed Energy Sector for Puerto Rico



Provides Puerto Rico with a 21<sup>st</sup> century energy sector that serves as an engine of economic growth while protecting the environment



Builds energy infrastructure that recognizes the need for a transformed and resilient system, while taking into account the projected decrease in demand



Achieves low-cost and reliable energy



Provides sustainable structural and financial models for energy on the Island



Leverages available federal funding for disaster recovery



Increases generation from renewable energy



Provides platform for the implementation of innovative technology to drive efficiencies and improve customer service through operational excellence



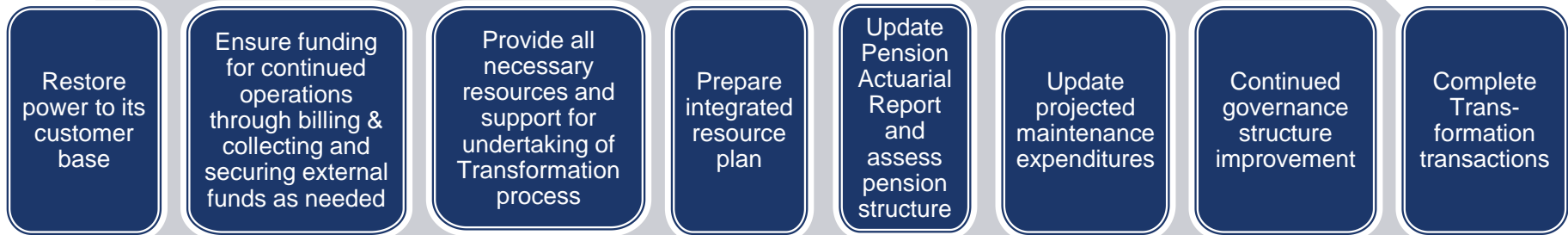
Provides, as applicable, professional and independent governance



Relies on a robust and transparent regulatory framework to regulate private and monopoly components of the new energy sector, promote private investment, and implement and manage efficient rate designs and effective incentives

# Critical Work Streams for the Illustrative 18-month Transformation Period

PREPA has identified and will undertake or complete the following tasks:



**Further implement cost controls and improve cash flow by executing the following initiatives:**

- Procurement process enhancements (i.e. OCPC)
- Cash distribution controls
- Collection of insurance proceeds
- Maximize federal funding available for disaster recovery
- Improved account maintenance and billing quality
- Improved fleet management
- Inventory management: warehouse consolidation and improved training on inventory management software

**Process**

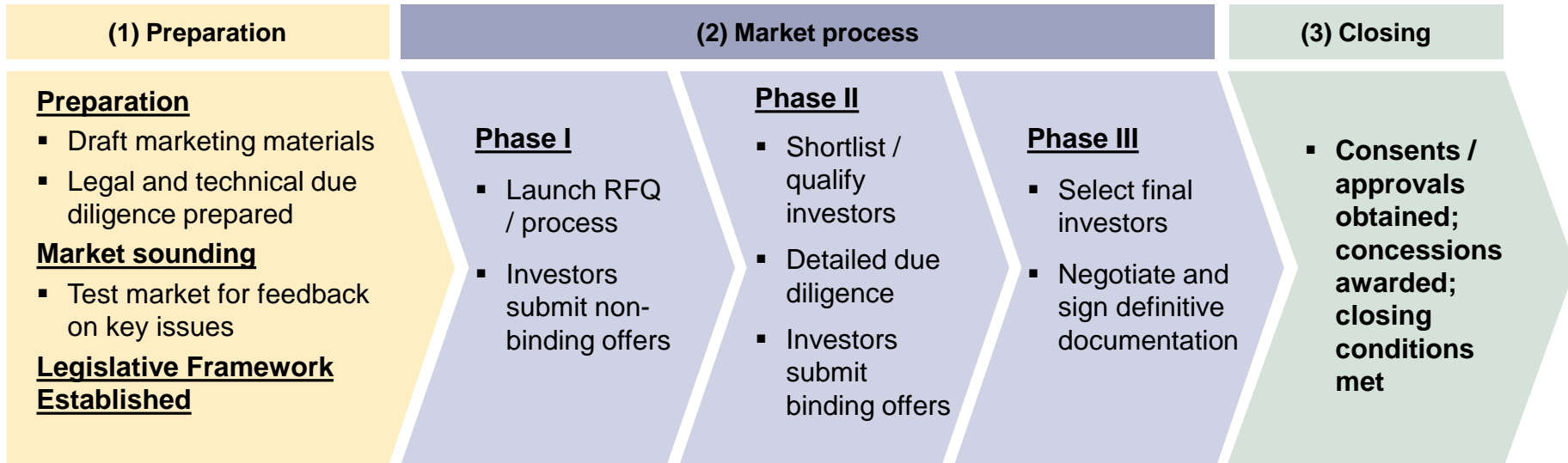
- Identify, introduce, and integrate private energy sector participants, capital, and expertise into the Puerto Rico Energy sector over 18 months
- Analyze and establish a productive industry structure and regulatory process to incentivize investment and innovation in energy technology

**Considerations**

- Amount and terms of federal funding available to support transformation of the electric sector will be a primary driver of the structure and desirability for approach to transformation and extent of private ownership or concession
- Any limitations to funding availability caused by structural or organizational options will be thoroughly scrutinized during the transformation identification and integration process

# Transformation Process – Illustrative Timeline

- T&D and Generation processes follow timeline in tandem



## Comparison of Regulatory Structures and Goals

### Regulation before and during restructuring

- Provide PREPA with adequate revenues / liquidity pending restructuring via reconciled rate; enable restoration / recovery; prevent asset deterioration
- Facilitate transformation (e.g., asset separation, transfer of public rights and licenses, PPOAs)
- Create framework for transparent, fair, and stable post-restructuring regulatory environment (including IRP oversight)

### Regulation post-Transformation

- Regulation of monopoly retail and T&D rates of concessionaire with performance metrics and incentives and rate design “toolbox” including decoupling and multi-year rate plans
- Regulate reliability / resiliency and some aspects of resource planning (e.g., T&D planning, RPS compliance; PPOA approval; reserve margin)
- Consider desirable market structures

## II. Historical Context and Current State

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# PREPA is Vertically Integrated and the Sole Provider of Energy in Puerto Rico

## Key statistics on PREPA, as of Fiscal Year End 2017



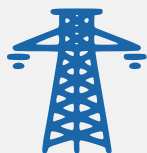
- **PREPA serves 1.5M** customers and has **6,235** employees



- For FY2017, PREPA had total revenues of **\$3.4B**, total assets of **\$9.4B**, and total liabilities of **\$11.4B**



- Overview of generation system:
  - Generating Capacity: **5,839 MW (PREPA 4,878 MW; IPP 961 MW)**
  - **45%** of generation is from oil, compared with national average of **4%**
  - **31** major generating units in **20** facilities; older than national average
  - **7%** of capacity from renewables<sup>1</sup>, vs. national average of **15%**



- Overview of transmission and distribution system<sup>2</sup>
  - Transmission Lines: **2,416 miles (230 kV / 115 kV)**
  - Distribution Lines: **30,675 miles (38 kV, 13 kV, 8 kV, 4kV)**
  - 38 kV substations: **283**
  - 115 kV substations: **51**

1. Including interconnected distributed generation capacity

2. PREPA and Puerto Rico Energy Resiliency Working Group report

# PREPA's Historic Challenges in Operating and Maintaining the Electric System are now Exacerbated by the Catastrophic Damage Caused by Hurricanes Irma and Maria

## Generation

- **Old and unreliable Generation** infrastructure (plants are 28+ years older than industry average)
- **Frequent power plant outages** (12 times more often than mainland US average)
- High dependence on **fuel oil and inability to diversify fuel mix** (2% of generation from renewables and 45% oil, relative to industry average of 4% oil)
- Principal generation located far from demand centers with a **poorly maintained** T&D infrastructure

## Transmission and Distribution

- **T&D infrastructure that has not been adequately maintained**, further contributing to outages, losses, poor quality
- The **\$2.5 billion** estimated expenditure need identified by PREPA in the 4-28 Certified Fiscal Plan for **repair and maintenance** prior to the hurricanes is no longer sufficient and does not address necessary **resiliency and hardening**
- **Highly vulnerable** to catastrophic events impacting delivery of electric service

## Collections and Customer Service

- Relatively high level of **technical losses and theft** (17.3% of energy lost\* in FY 2016 was higher than industry average)
- Disorganized and ineffective **customer service infrastructure**
- **Inconsistent and unreliable** IT system for remote, reliable, and timely collections, and service
- **High vulnerability** to damage from disasters immediately impacting collections, revenue, and service

\*PREPA Planning and Research Directorate

# PREPA's Historic Challenges in Operating and Maintaining the Electric System are now Exacerbated by the Catastrophic Damage Caused by Hurricanes Irma and Maria

## Organizational

- Lack of **institutionalized processes and procedures**
- **Outdated systems** and information technology
- Above-market benefits in **collective bargaining agreements** with evergreen provisions
- **Underfunded pension obligations** (over \$3.6BB)
- Significant losses of experienced personnel

## Environmental and Safety Compliance

- **Safety system and record dramatically below industry standards**
- **History of environmental non-compliance**
- Inability to execute PREPA's **strategic environmental compliance plan**, including timely compliance with MATS (Mercury and Air Toxic Standards) EPA emission limits

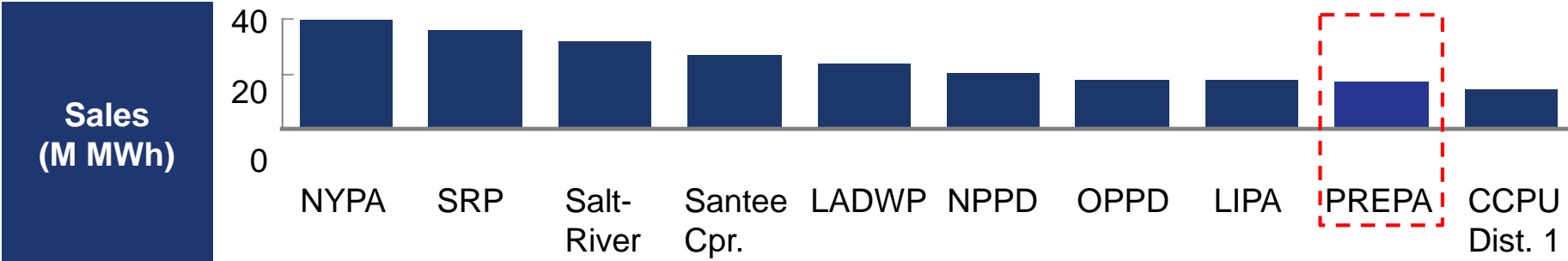
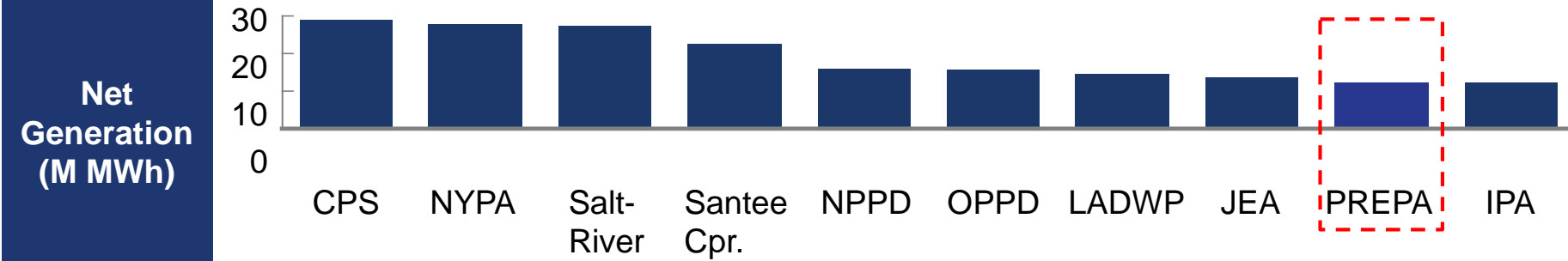
## Operating Environment

- **PREPA's static business model** has not adopted changes in a rapidly changing and innovative industry
- Legal requirements to provide power to certain customers at **subsidized rates**
- **Poor quality** of electric service has impacted business and investment climate
- The prolonged and ongoing recession has led to a significant **drop in energy sales**
- Poor credit rating leading to **lack of market access** and the inability to invest in needed capital expenditure projects

## Post-Irma and Maria Challenges

- **Accelerated migration** of population
- **Accelerated demand reductions**
- **Greater possibility** of distributed generation and inside fence generation
- **Dramatic economic contraction and job losses**
- **Deeper distrust** in state-monopoly as sole provider of electricity

# PREPA is One of the Largest Public Power Utilities in the US by Customer, but has Relatively Low Generation and Sales on a Per Customer Basis

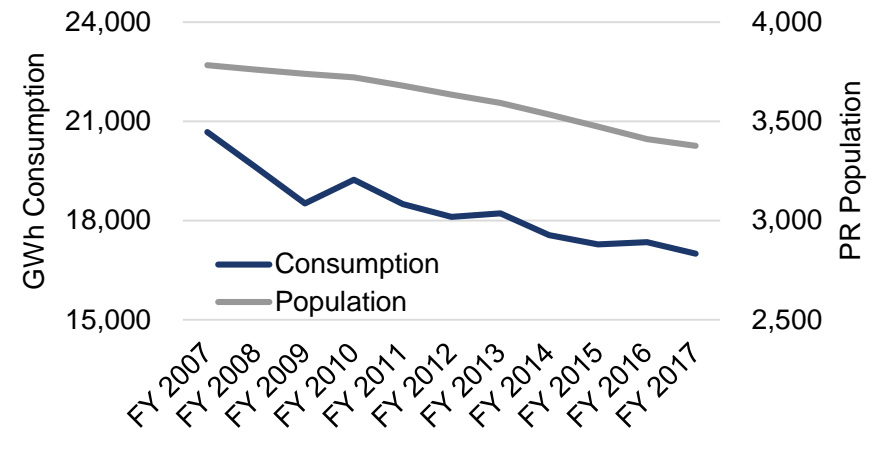
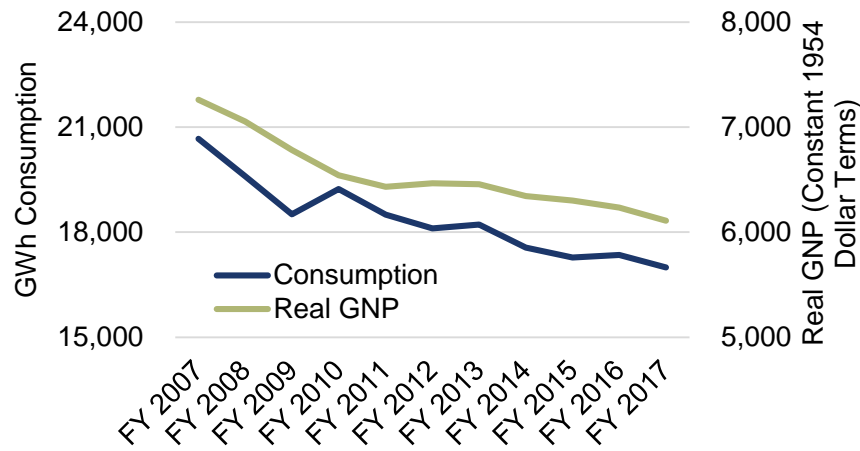


Source: PREPA, as of June 30, 2016, based on unaudited results  
 APPA. "U.S. Electric Utility Industry Statistics, 2014". 2016-2017 Annual Directory & Statistical Report



# Poor Macroeconomic Trends have Deepened Impacts upon PREPA's Operations

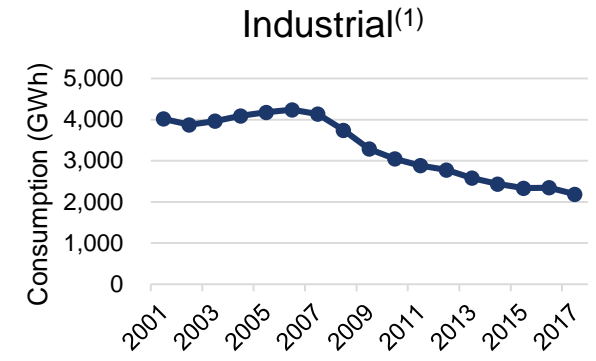
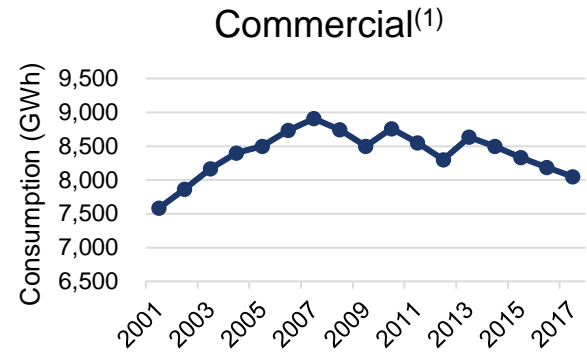
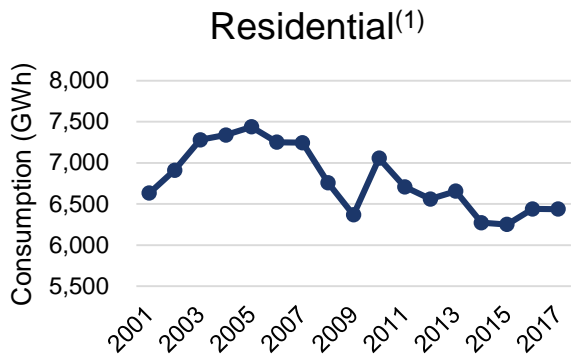
As the economy deteriorated, population declined, and disruptive technologies have emerged, demand dropped 18% from 2007 to 2017



13% loss in demand in the residential sector since 2005 peak

10% loss in demand in the commercial sector since 2007 peak

48% loss in demand in the key industrial sector since 2006 peak



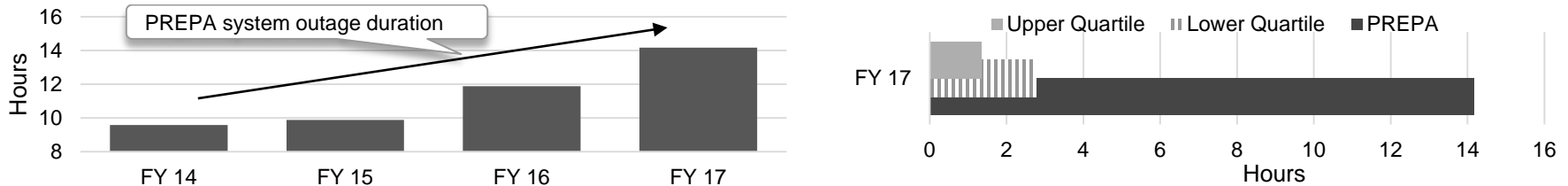
(1) Source: PREPA's rate records from 2000-2017



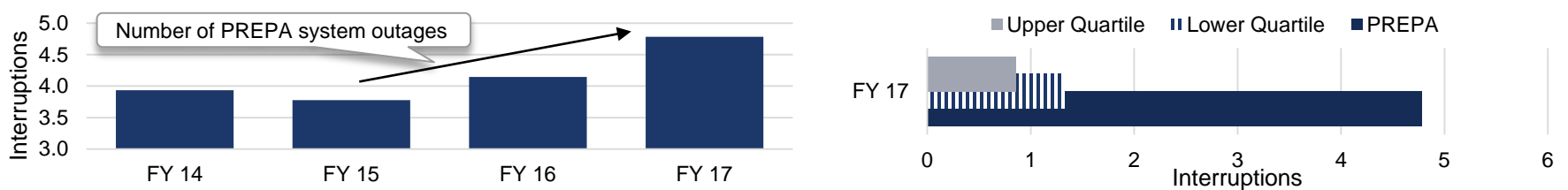
# Pre-Storm Reliability Metrics were Dismal Relative to Industry and Trending Worse

	FY17	2016 Utility Peer Group			Comparison of PREPA reliability to median North American Utility Peer Group reliability <sup>(1)</sup>
	PREPA <sup>(1)</sup>	Lower Quartile	Median <sup>(3)</sup>	Upper Quartile	
SAIDI	14.35	2.77	1.92	1.35	On average, PREPA customers do not have power for 14.4 hours
SAIFI	4.83	1.32	1.04	0.86	PREPA customers lose power almost 5 times a year on average
CAIDI	2.97	2.10	1.84	1.57	On average, when PREPA customers lose power it takes 3 hours to restore

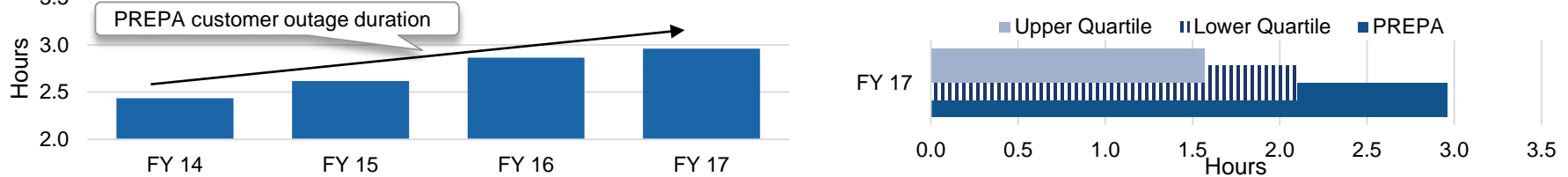
**System Average Interruption Duration Index (“SAIDI”)**



**System Average Interruption Frequency Index (“SAIFI”)**



**Customer Average Interruption Duration Index (“CAIDI”)**

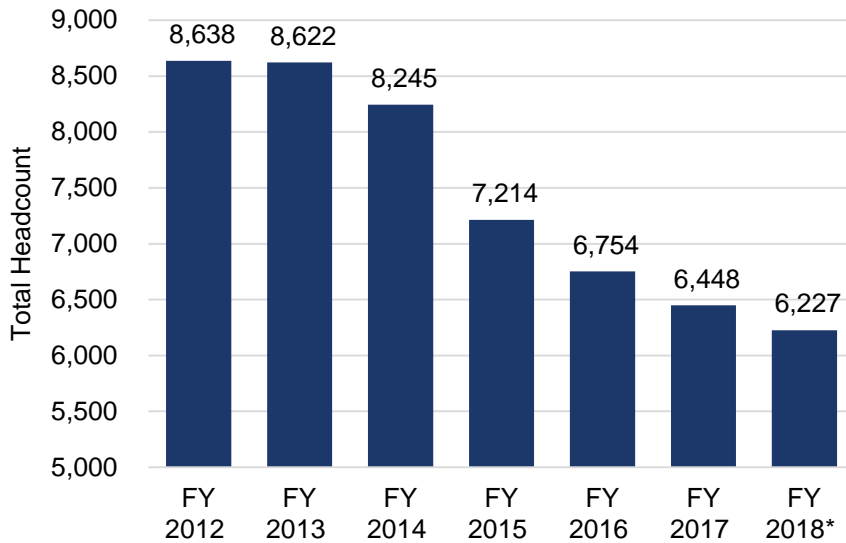


- 1) PREPA data LTM as of July 2017, SAIDI/CAIDI are measured in hours and SAIFI is measured in # of occurrences
- 2) FY 2017 data projected based on prior year performance for August through December to exclude the impact of the hurricanes
- 3) Source of SAIFI, SAIDI and CAIDI North American utility data is the IEEE Benchmark report

# Key Operational Areas – Headcount Reduction

The loss of almost 30% of its workforce since 2012 has constrained PREPA's ability to respond to challenges

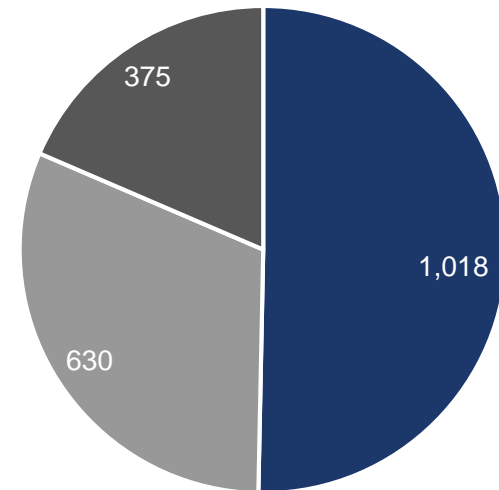
Annual Average Employee Headcount



\*Latest Available as of December 2017

- 6,227 as of December 2017
- PREPA's headcount declined by 2,411 from FY 2012 to Dec 2017 – mostly due to retirement

Employee Retirements from 2012-2017



- Transmission & Distribution
- Generation
- Customer Service

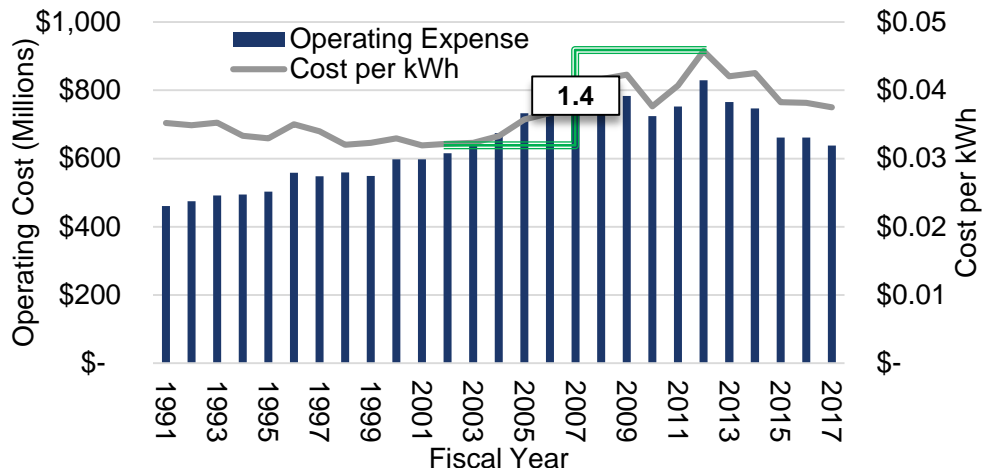
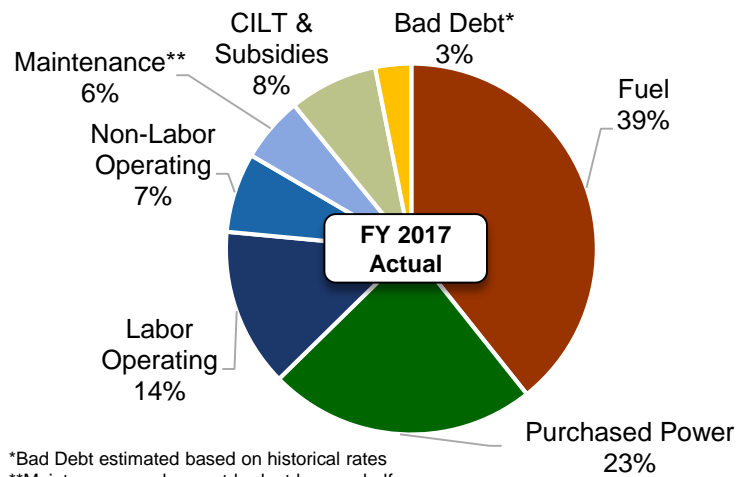
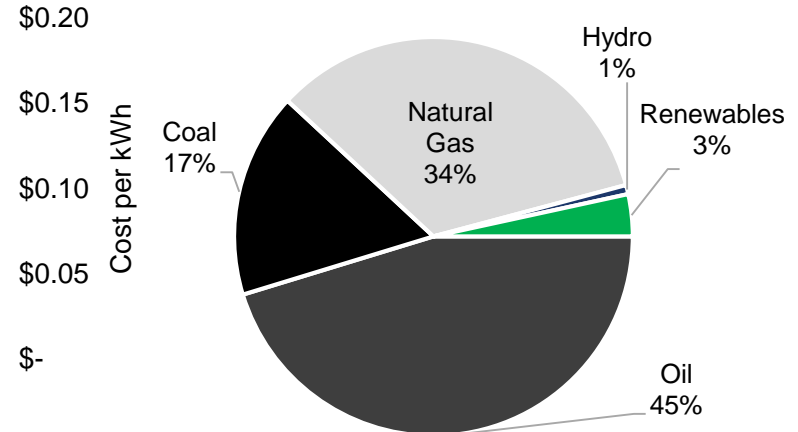
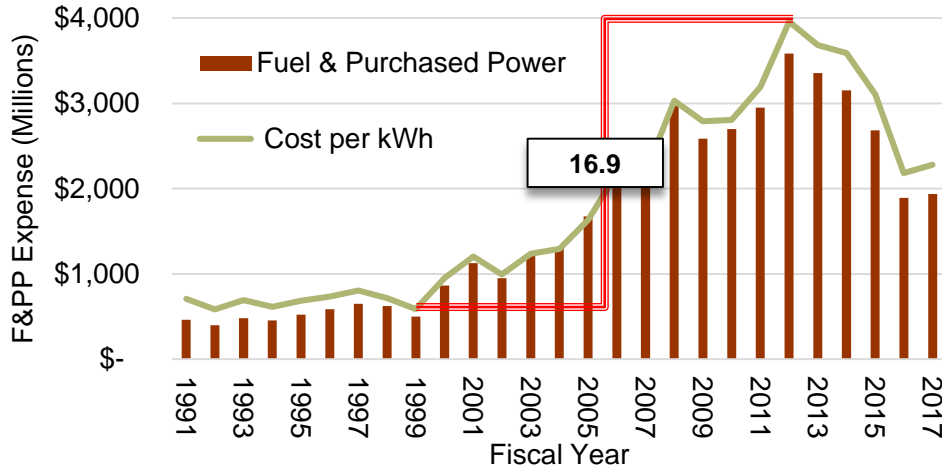
- Of the 2,343 employees that retired between 2012 and 2017, 2,023 (86%) were from operations and 320 from administration

Source: PREPA Human Resources Directorate

\* PREPA has ~600 employees who are awaiting approval from the Employees Retirement System of PREPA

# Fuel/Purchased Power Expense Increased Dramatically over the Past Two Decades

Fuel and Purchased Power is the predominant cost and most volatile rate component for PREPA. Reducing dependence on refined fuel oil for power generation has long been a top priority for PREPA and though progress has been made, oil remains the main source of energy.



\*Bad Debt estimated based on historical rates  
 \*\*Maintenance underspent budget by over half

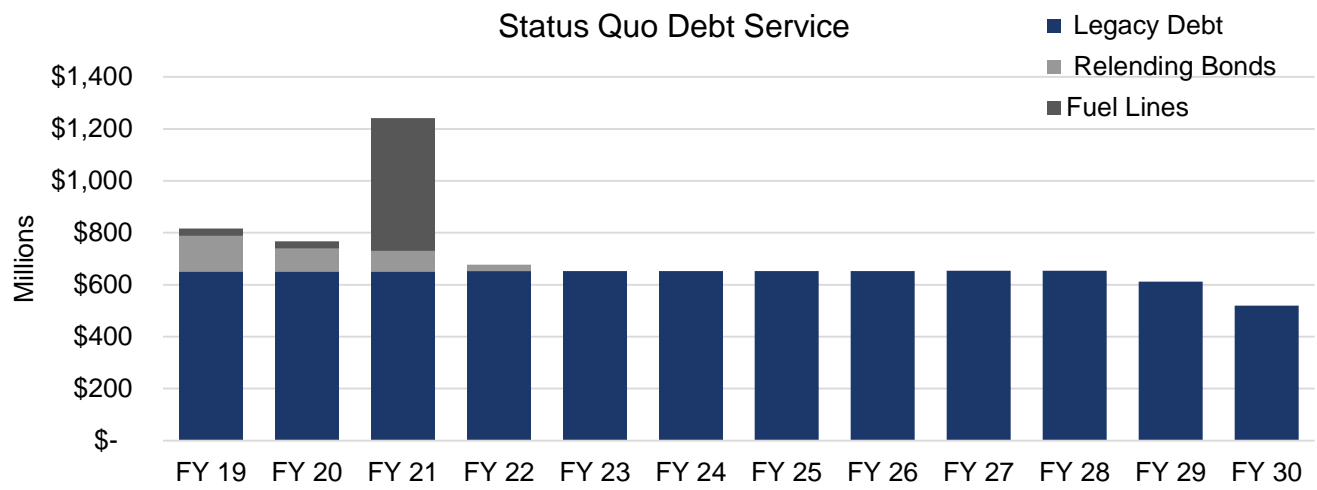
Source: PREPA Planning & Finance





# PREPA's Current Debt Structure is Not Sustainable

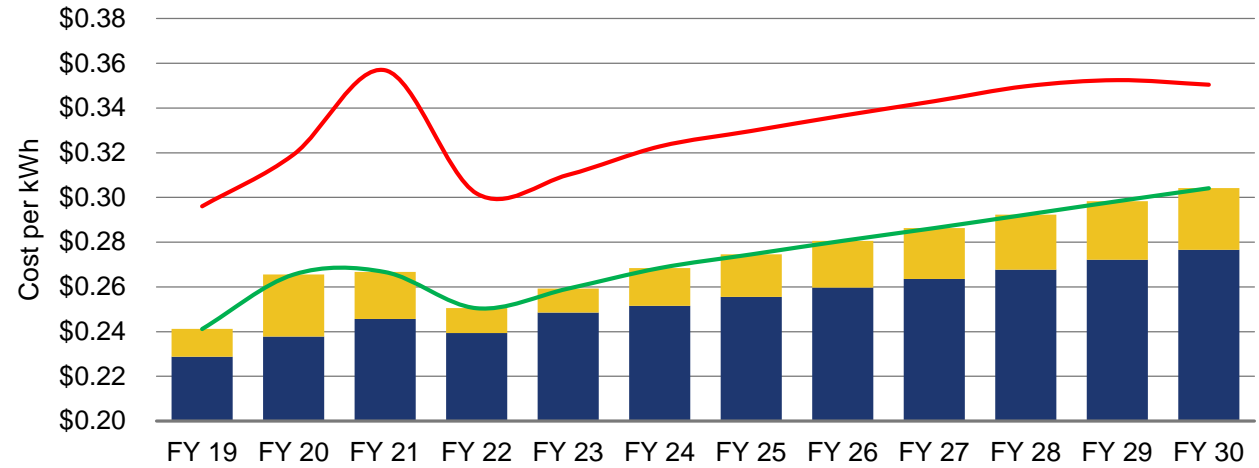
- Funding debt service at any level will require a rate increase over current levels or other dedicated revenue stream
- The estimated annual debt service obligation based on term out of all long-term financial liabilities at a 5% over 25 years is approximately \$657 million per year



## Required Rate Increases to Cover PREPA Status Quo Operating Shortfalls (Before Initiatives) and Legacy Debt Service

- Due to declining load projections over the forecast period, the declining status-quo debt service schedule increases on a per kWh basis

- Overall Rate
- Breakeven Increase
- No Debt Service
- Including Debt Service



\$9.258bn outstanding debt as of 5/3/2017



## Pension: Underfunding Poses Another Significant Challenge for PREPA

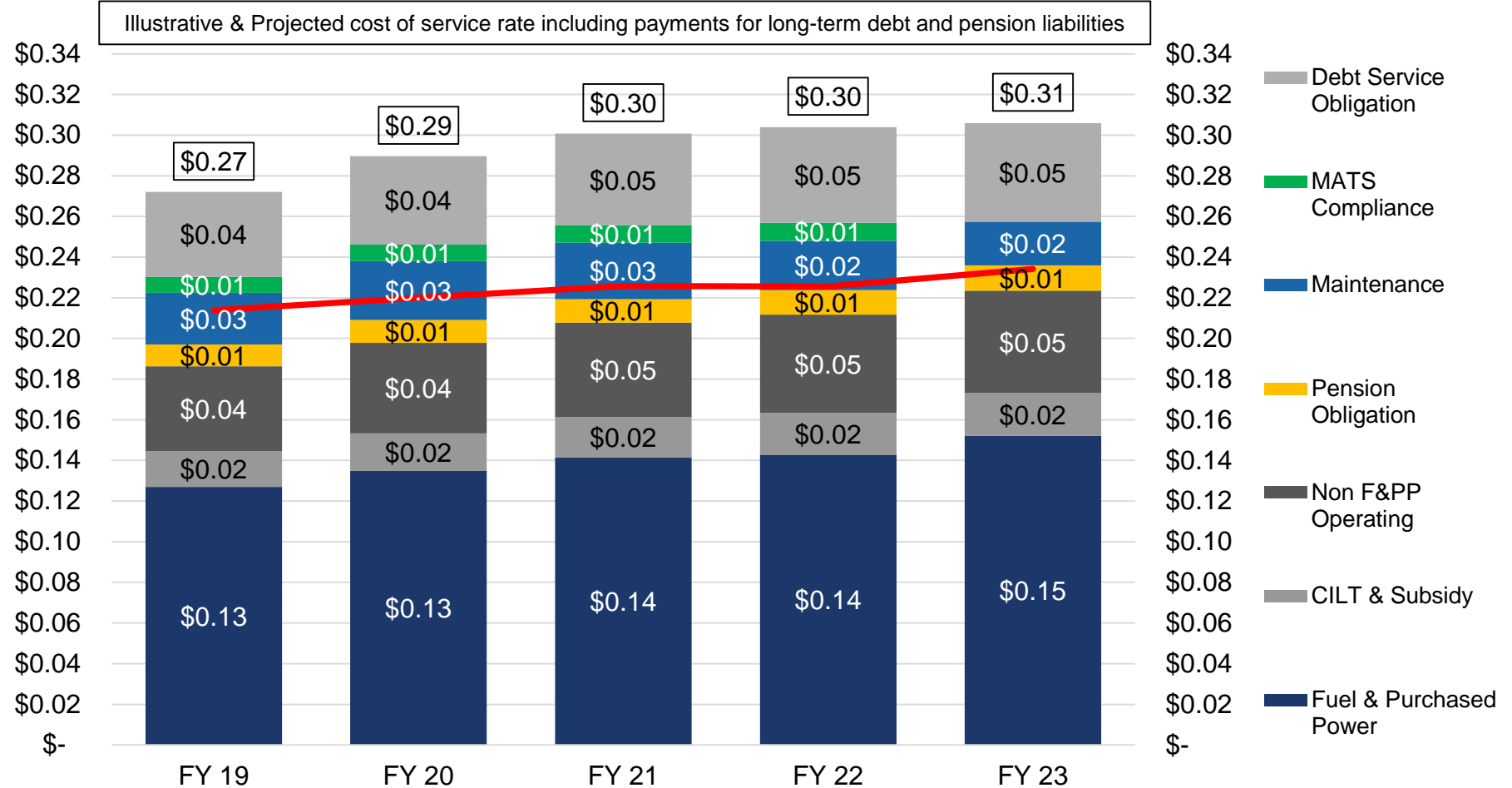
- PREPA’s Employee Retirement System (“PREPA ERS”) is designed to meet the defined-benefit pension and other post-employment benefits (“OPEB”) obligations of PREPA’s active and retired employees (including beneficiaries)
- The PREPA ERS is significantly underfunded - as much as ~\$3.6B (based on an optimistic 8.25% rate of return). PREPA is in the process of reviewing and updating these numbers and projections. PREPA expects that the unfunded liability could be significantly higher particularly when considering recent trends in PREPA employees and a more realistic lower rate of return.
- OPEB (\$384m accrued) is entirely unfunded as reported in PREPA’s 2012 “Report of Actuary on the Other Post-Employment Benefit REVISED Valuation”, revised as of October 2015
- The following chart depicts the funding ratio of the ERS plan under various rates of return:

	PREPA 2014 Actuary Report (\$B)
<b>Discount Rate</b>	8.25%
<b>Total Pension Liability (“TPL”)</b>	5.0
<b>Fiduciary Net Position (PREPA ERS Assets ) (“FNP”)</b>	1.4
<b>Net Pension Liability (“NPL”)</b>	3.6
<b>Funded Ratio</b>	28%

In February 2018, PREPA received a revised actuarial report from the Retirement System based on 2014 data. The Net Pension Liability more than doubled from \$1.7B to \$3.6B compared to the initial report

# PREPA Rate Projections to Cover all Legacy Liabilities are Above 30 cents / kWh

## Achieving Target Rate Requires Restructuring of PREPA Obligations and Implementation of Transformation Plan



- 1) Cost of Service includes investments for MATS to replace non-compliant residual oil generation with diesel or natural gas
- 2) Maintenance expense necessary Transmission IRP project expenditures, which are expected to be revised and updated during the IRP process.
- 3) Debt Service Obligation estimated based on term out of all long-term financial liabilities at a 5% rate over 25 years
- 4) Resolution of PREPA ERS underfunding will likely require higher contribution than indicated, actuarial study to determine full amount is in progress

— Current Rates - No Rate Change



### III. Operational Initiatives and Performance Improvement

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## PREPA is approaching 1.5 cents / kWh savings target set forth by the FOMB

- Up to \$130 million of improvement opportunities were identified in non-fuel & purchased power operating expense areas (i.e. 1 cent / kWh in FY 2023) through a bottoms-up analysis of the organization and work force
- PREPA has commenced “Work Plan 180” to discover and qualify additional improvements, further validate already identified opportunities, and develop initial execution plans for implementation
- Since FY 2012, PREPA has reduced its Labor O&M expenditure by over \$200 million annually, and anticipates realizing an additional reduction of \$40 million annually beginning FY 2019 due to pending retirements
- Emphasis is being placed on employee productivity, customer service quality, and long-term power system infrastructure improvements through status quo operational initiatives and energy sector transformation

### Recent Updates: Near-Term Operational Improvements identified through WP-180

PREPA has identified and executed on certain performance improvement initiatives, and commenced the Work Plan 180 initiative discovery and implementation process on February 23, 2018, to enhance efforts to reach the 1.5 cent / kWh target.

Operations: On January 23, 2018, PREPA shut down Aguirre’s combined cycle unit and Cambalache’s peaking units for fuel saving purposes

- Preliminary fuel savings estimate is \$28M annually based on more efficient utilization and dispatching lower cost generation plants

Fuel Mix: As of the week ending February 24, 2018, PREPA increased LNG consumption at the Costa Sur plant to lower overall fuel costs

- Preliminary fuel savings estimate is \$24M annually based on lower priced fuel source

See Appendix for Work Plan 180 background and timeline

## Performance Improvement Activities (WP – 180)

PREPA along with its Financial Advisors has initiated a team based Performance Improvement Initiative, known as WP-180, focused on evaluating operational and contractual business practices of the organization with the goal of identifying opportunities to increase operating efficiency and reduce costs. Teams of employees and advisors have been actively reviewing the operations of PREPA's directorates (i.e. Transmission/ Distribution, Generation, Administrative, Customer Relations, HR, etc) as well its principal cost centers (e.g. Fuel and Power Purchasing). Initiatives identified by each team are evaluated, scoped, and prioritized with detailed execution plans developed that ensure implementation and monitor performance. It is anticipated that all existing and future performance improvement efforts will be analyzed and validated through the Work Plan 180 process.

### Work Plan 180 Performance Improvement Goals

Substantially improve employee safety to levels defined as top decile performance as recognized by OSHA standards

Improve environmental compliance and achieve zero notices of violation

Maximize efficiency of labor efforts and eliminate unproductive processes or work rules

Improve cost competitiveness of the organization

Develop formal corporate processes that analyze spend and define the most effective utilization of available funds

Improve reliability performance of the corporate assets

Sell off non-core assets (PREPA Net) to be reviewed by its holding company board (i.e. PREPA Holdings)

See Appendix for Work Plan 180 background and timeline

# PREPA Identified Operational Improvement Initiatives

Certain performance improvements have begun and will continue during the 18-month period, but full potential of opportunities identified will require or be optimized by privatization.

Category	Opportunity Type	Initiative	Stage	18 Month*	Initiative Sizing
Non-F&PP	Productivity Improvement	Optimize Procurement and Logistics	Review / Analysis	Yes	TBD
Non-F&PP	Productivity Improvement	Inventory Management	Review / Analysis	Yes	TBD
Non-F&PP	Productivity Improvement	CBA Work Rules	Review / Analysis	Yes	TBD
Non-F&PP	Productivity Improvement	Vegetation Management	Underway	Yes	N/A
Non-F&PP	Productivity Improvement	T&D Maintenance Execution	Underway	Yes	N/A
<b>Total Non-F&amp;PP Current Cash Expense</b>					
					<b>\$80 - 155</b>
F&PP	Current Cash Expense	Fuel Sourcing	Underway	Yes	\$5 - 10
F&PP	Current Cash Expense	Dispatch Improvements	Underway	Yes	\$25 - 30
F&PP	Current Cash Expense	Increased LNG Usage	Underway	Yes	\$20 - 25
F&PP	Current Cash Expense	Public Lighting Outsourcing/P3	Review / Analysis		\$25 - 40
F&PP	Current Cash Expense	Conventional PPOA Price Renegotiation	Review / Analysis		\$100 - 130
<b>Total F&amp;PP Current Cash Expense</b>					
					<b>\$175 - 235</b>
Non-F&PP	Future Cost Increases	Fleet Management Reorganization	Review / Analysis	Yes	TBD
Non-F&PP	Future Cost Increases	Pension Obligation Reform	Review / Analysis	Yes	TBD
Non-F&PP	Future Cost Increases	Smart/Micro Grids, Automated Systems	Underway		TBD
F&PP	Future Cost Increases	Renewable PPOA Price Renegotiation	Underway	Yes	\$45 - 55
F&PP	Future Cost Increases	Reduce Forced Outages, System Heat Rate	Underway		\$90 - 120
F&PP	Future Cost Increases	New LNG Supply Permits and Funding	Underway	Yes	\$200 - 300
<b>Total Avoided Future Cost Increases</b>					
					<b>\$335 - 475</b>

\*Achievement possible within 18-month transformation period, all other initiatives are likely to require privatization

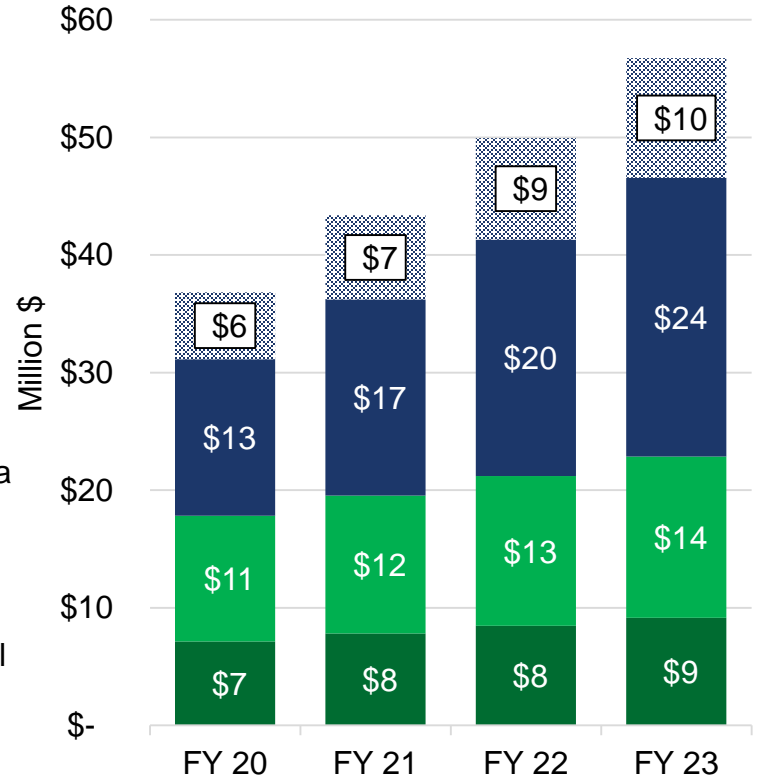
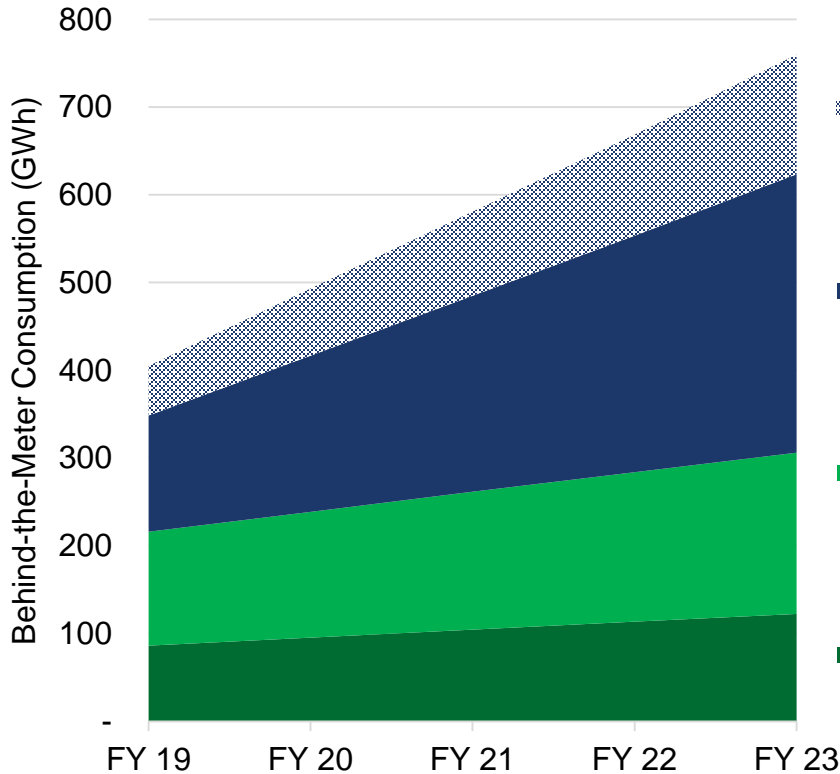
Notes:

- 1) Subject to further diligence. Sizing of potential impact is preliminary and provided solely for illustrative purposes (as discussed with FOMB advisors).
- 2) Subject to material change and revisions. The initiatives are subject to varying levels of execution risks due to a series of affecting factors, including but not limited to required actions and results that are outside of PREPA's control.
- 3) Financial impact is subject to material change. Activities flagged as "TBD" are in the process of being sized.
- 4) A number of the initiatives included would impact the fuel/purchased power cost items and thus do not directly impact free cash flow.

# Potential Cost Reductions – Behind the Meter Revenue Recovery

Increased revenue can be generated by recovering fixed system costs and customer subsidy costs from distributed generation net metering (DGNM) customers that benefit from access to the PREPA grid

- Upside case for Industrial DG/CHP behind the meter revenue recovery represents a case in which all industrial customers remain at least partially connected to the grid and could be charged for grid services and stranded costs
- Customers that disconnect fully would be exceedingly difficult to recover revenues from beyond a disconnection charge



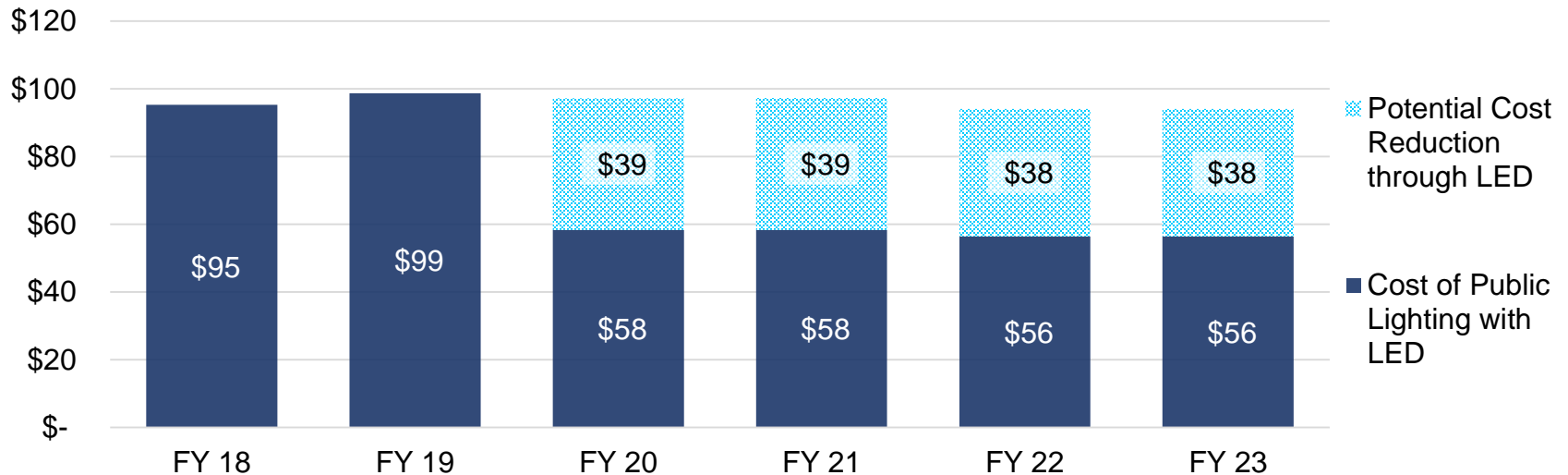


# Potential Cost Reductions – Public Lighting Outsourcing/P3

## Benefits of converting public light fixtures with LED bulbs

- Switching to LED street technology can save between 50% and 80% in energy costs, in addition to reduced maintenance costs due to longer bulb lifespan (average 20-year expected)
- A portion of the total cost savings is allocated for return on upfront investment made through a public private partnership
- Societal benefits: A study conducted by US Department of Transportation found that the improved lighting conditions provided by LED technology can decrease traffic accidents by 3.1%
- Approximately 10% of light emitted by current public lighting fixtures causes glare and only 40% of the light produced illuminates its intended target

## Potential cost savings assumed from energy efficient LED investment in public lighting (40%)

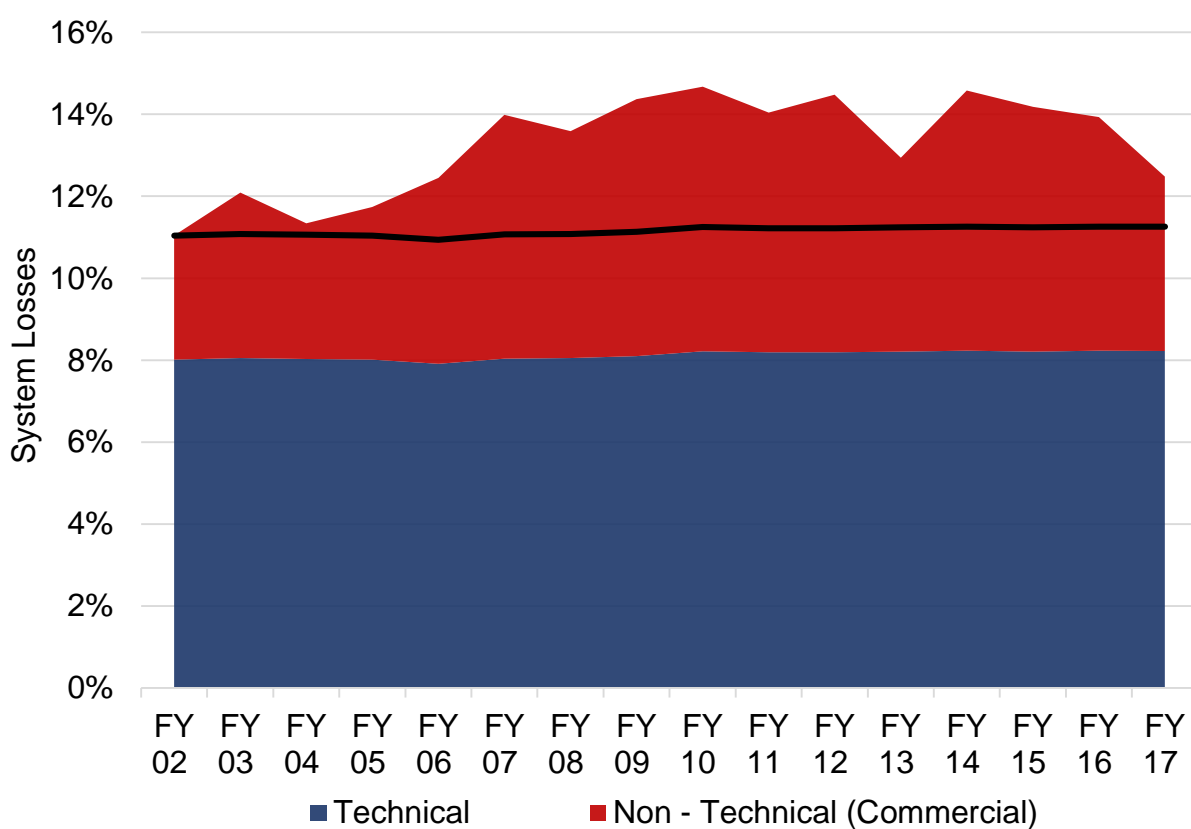


SOURCE: Cost-Benefit Study for the Proposal to Modernize Street Lighting in Puerto Rico by Estudios Tecnicos Inc. as of January 15, 2015.

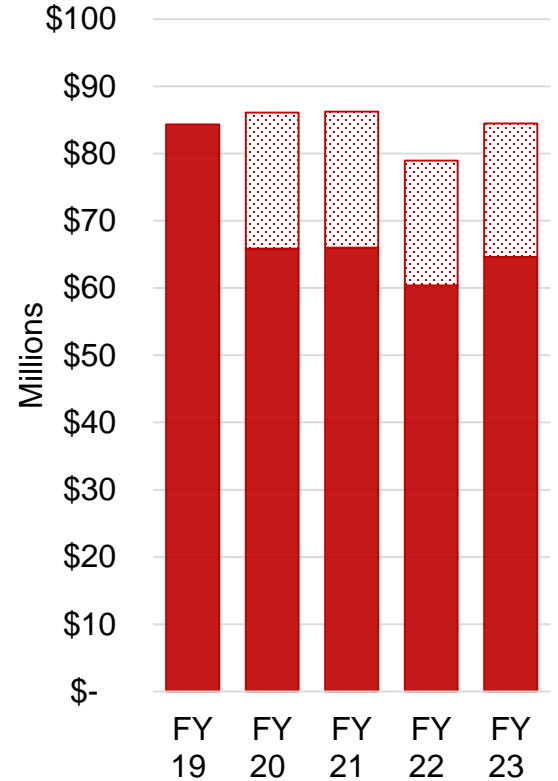


# Potential Cost Reductions – Non-Technical Losses

PREPA can reduce costs by continuing to improve its theft reduction program. Reducing commercial losses to approximately 3% will further reduce fuel and purchased power costs.



line represents FY 2002 commercial loss levels as a demonstrably achievable baseline

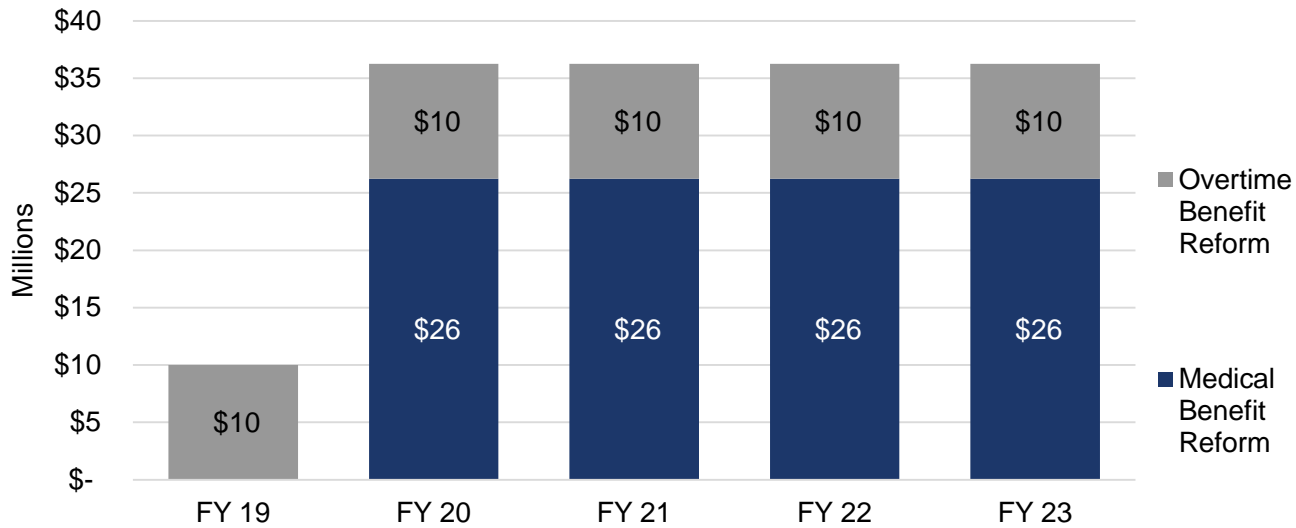


▨ 1% Commercial Loss Cost Reduction  
■ Cost of Commercial Losses

# Potential Employee Benefits Reform

As a result of Act 26-2017, PREPA has the following opportunities to reduce its employee costs<sup>(1)</sup>:

- Overtime – labor overtime rates are assumed to be reduced from 2x to 1.5x (25% cost reduction from \$40 to \$30 million per year)
- Health – PREPA currently self-funds all medical expenses, and spends approximately \$9,600 per employee per year, significantly above the contribution levels at other government agencies. Act 26-2017 sets forth guidelines to align government agency health plan contributions. PREPA estimates there could be cost reductions through potential combination of the following:
  - Enrollment in an externally insured medical plan through a competitive process
  - Adjustment of copays and deductibles
- Pension – AAFAF and PREPA are currently working with an independent actuarial firm to update the projected costs of pension liabilities, which is expected to be completed by 3<sup>rd</sup> quarter 2018. Upon completion, PREPA will be able to determine potential options to address the multi-billion unfunded pension liability.

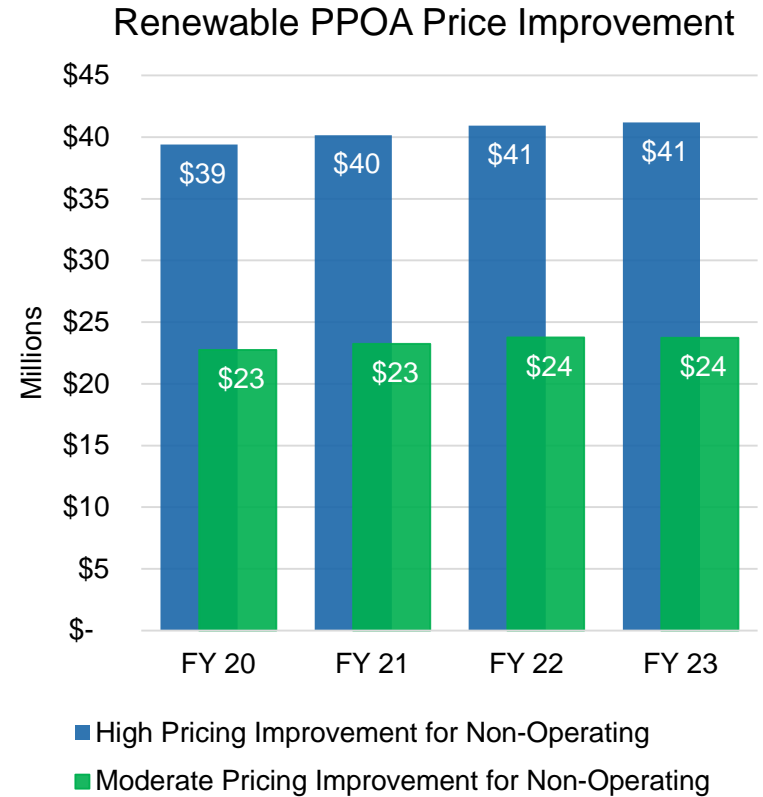
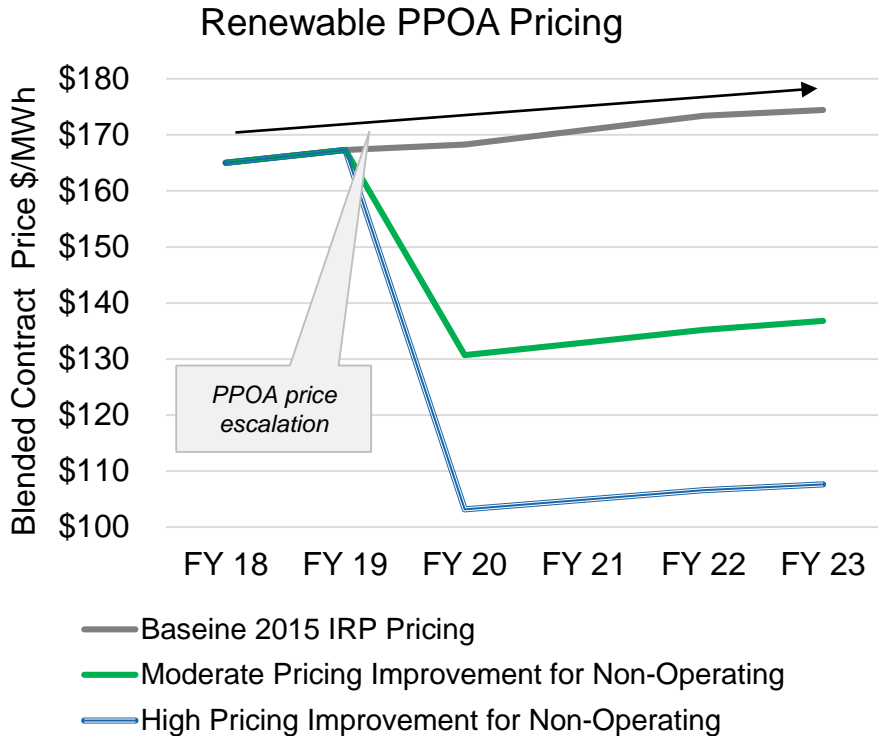


1) PREPA continues to analyze the impact of Act 26-2017, including a potential mandate to further reduce medical benefits, as may be required by the Fiscal Plan Compliance Committee that was created under the same statute

# Potential Cost Reductions – Capacity and Renewable PPOAs

PREPA has identified potential areas of opportunity for revised contract price assumptions

- Future renewable PPOA contract price assumptions are preliminarily assessed as above potential competitive procurement prices
- Achieving the potential cost reductions could be negotiated or assisted by Title III process, and are included for illustrative purpose



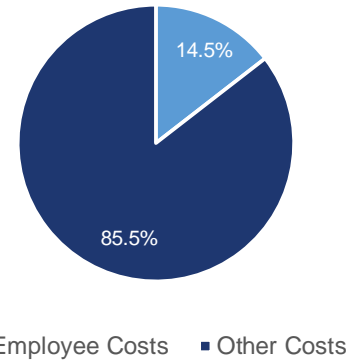
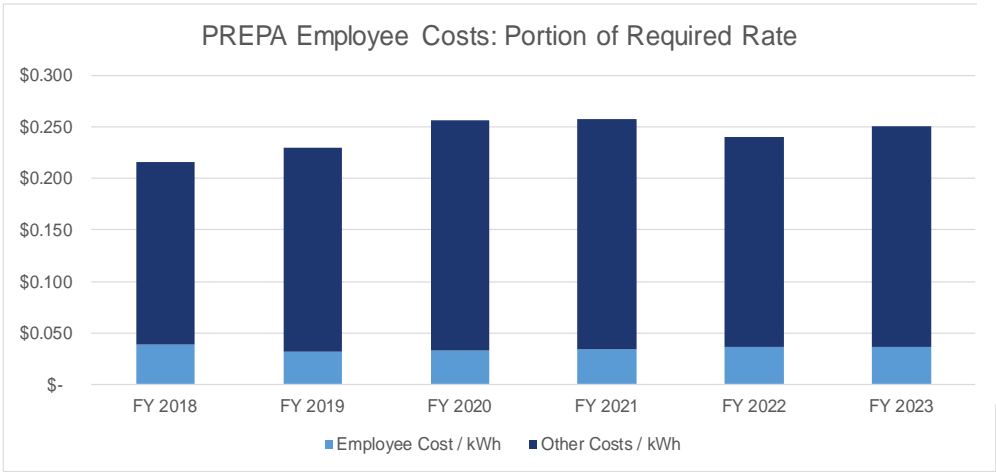
Source: PREPA Planning, Bloomberg New Energy Finance, Restructuring Advisor Analysis

Note: price improvement potential is based on PREPA analysis of comparable contracts and modelling of current market capacity and PPOA pricing

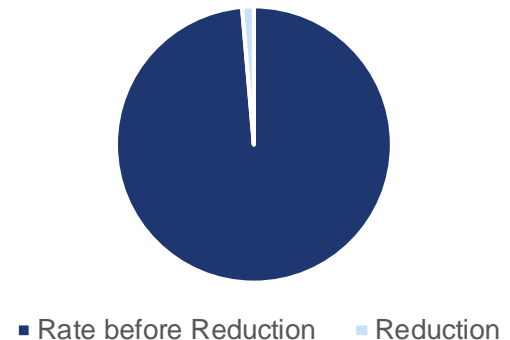
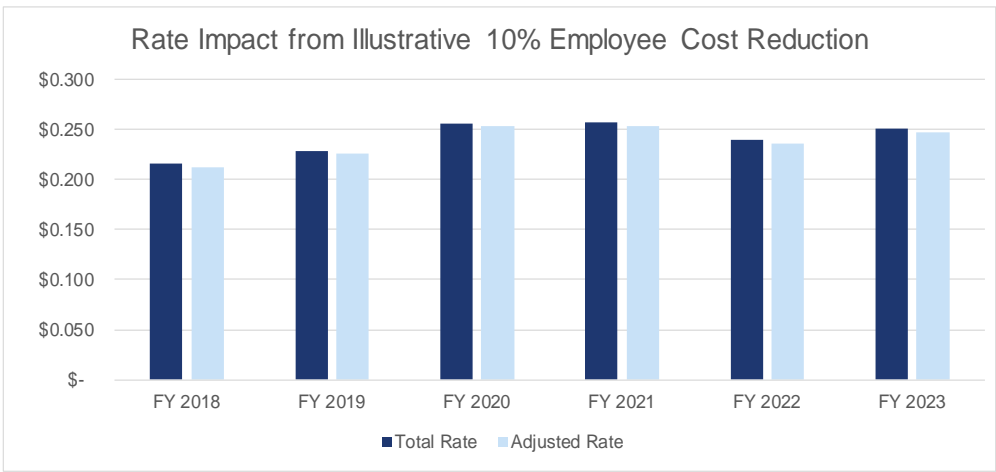
# Potential Cost Reductions - Retirement Savings Impact from Reduced Salaries

Approximately 10% of PREPA's work force has submitted paperwork to retire with the Retirement System. If all ~600 employees retire and are not replaced, PREPA will realize employee cost savings of ~\$45M

- Employee Costs contribute ~15% of PREPA's total cost structure for the Fiscal Plan Period



- A 10% reduction in wages (via reductions in headcount) causes a ~1.5% reduction to the Total Rate



## IV. Baseline Financial Projections

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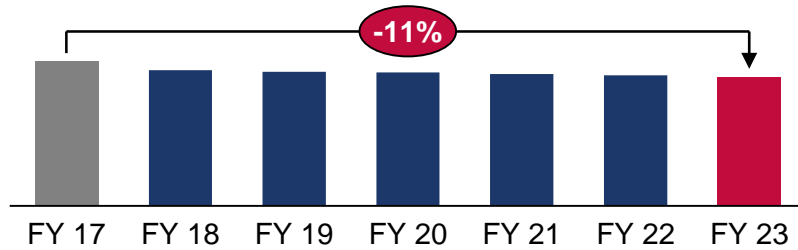
## Fiscal Plan Status Quo / Steady State Key Assumptions and Metrics

The Financial Projections in this section assume PREPA continues to exist “status quo” as a public corporation. The impact of aspirational operational initiatives identified are illustrative in nature and must be viewed in the context of PREPA’s historical challenges

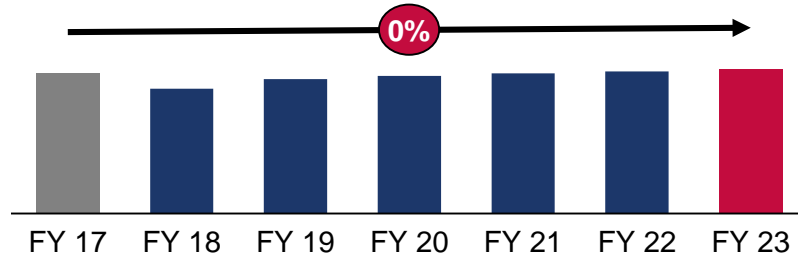
Input	Assumptions
<b>Macroeconomic</b>	Revised forecasts due to the combined effects of austerity, population decline, natural disasters, and increased deployment of Distributed Generation / Energy Efficiency (“DG/EE”)
<b>Current Rates</b>	Continuing operating under ~ <b>7.5 cent</b> (base + provisional) rate that went into effect in August 2016 Review rate regulation alternatives such as <b>Formula Rate Making (FRM)</b> and <b>Multi-year rate filings</b>
<b>Fuel &amp; Purchased Power</b>	Price of Residual Oil (#6) is approximately <b>40%</b> higher than the forecast used in the Certified Fiscal Plan (EIA Annual Energy Outlook 2017); proportionally higher than expected diesel burn due to system instability
<b>Ongoing Maintenance</b>	Expenditure requirements and schedule has <b>changed significantly</b> . Currently, there is low visibility on revised aggregate levels and timing due to restoration activities and need for updated IRP. PREPA is expected to require additional funds above the annual average anticipated for Transmission IRP maintenance.
<b>MATS Compliance / Renewables</b>	Construction start date moved to <b>January 1, 2020</b> – online date to <b>July 1, 2021</b> . Alternative projects to accommodate additional LNG capacity are currently being discussed and are in the early stages of evaluation. Other compliance alternatives will be reviewed in the updated IRP. RFP for 300 - 600MW of renewable capacity will be developed.
<b>Liquidity and Operations</b>	Assumes receipt of external funding to cover expected deficit estimated for lost revenue but does not include repayment or terms associated with potential credit facilities FY2020 and beyond require rate adjustments or external funding for necessary operating and maintenance expenses
<b>Restoration Funding</b>	Timing of expenditure and disbursement is still uncertain and not included in the financial projections. The central government has <b>sized at \$13-14 Billion</b> – initial disbursement of \$2 billion approved with 100% FEMA cost share. Puerto Rico is requesting a cost-share adjustment for future FEMA’s program amounts under the Stafford Act, but potentially requires 10% cost-share match from PREPA. Puerto Rico seeks Community Development Block Grant-Disaster Recovery (CDBG-DR) funding to cover the cost-share match requirements of Stafford Acts programs. Historically, either FEMA or Congress has authorized a 100% federal cost-share for large and catastrophic disasters such as Hurricane Andrew in Florida and Hurricane Katrina in Louisiana and Mississippi.

# Macro Assumptions and Drivers

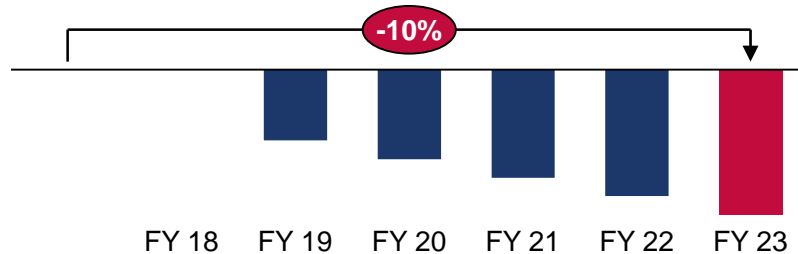
## POPULATION DECLINE



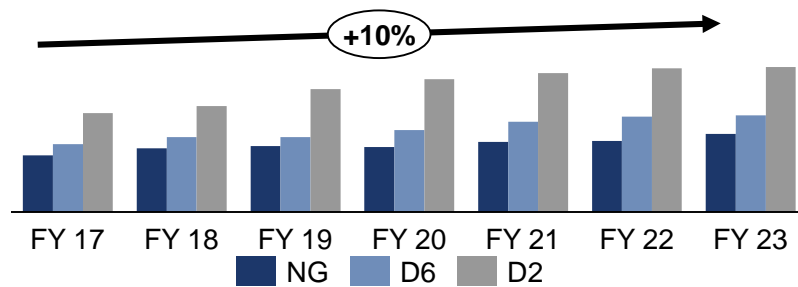
## ECONOMIC STAGNATION



## ENERGY EFFICIENCY DISTRIBUTED GENERATION



## FUEL PRICE INFLATION

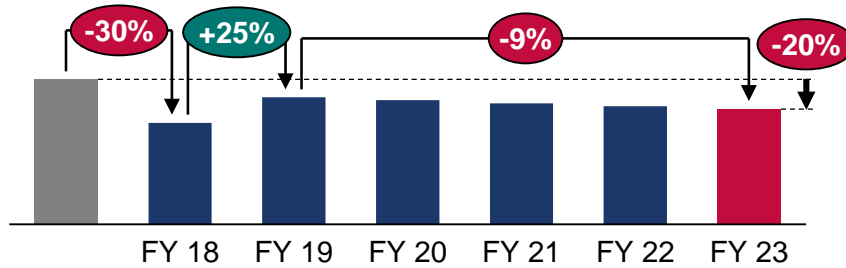


- The central government population forecast projects accelerated population decline due to the combined effects of austerity, economic depression, and natural disaster impacts
- Economic decline for the fiscal plan forecast period is offset by increased federal funding for restoration, which creates short-term employment opportunities but does not stop the net migration from the island
- Distributed generation, both net metering and grid defection, and energy efficiency solutions deployment are assumed to accelerate during restoration, which drives down load and energy sales an additional 10% by FY 2023
- Short-term fuel price budget projections were adjusted for recent changes in residual oil and diesel prices. Long-term prices are expected to rise and increase per-unit fuel costs



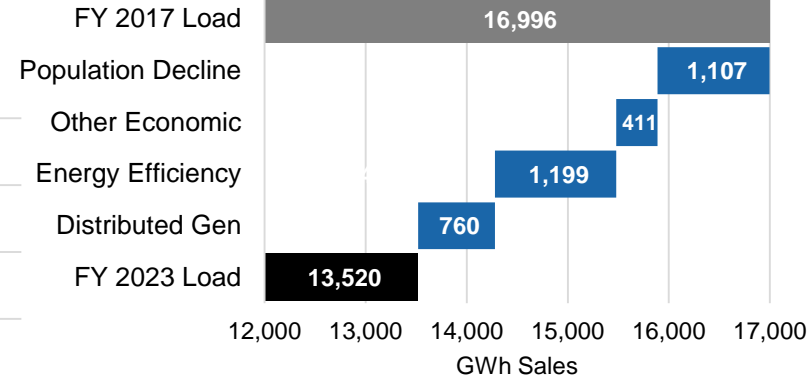
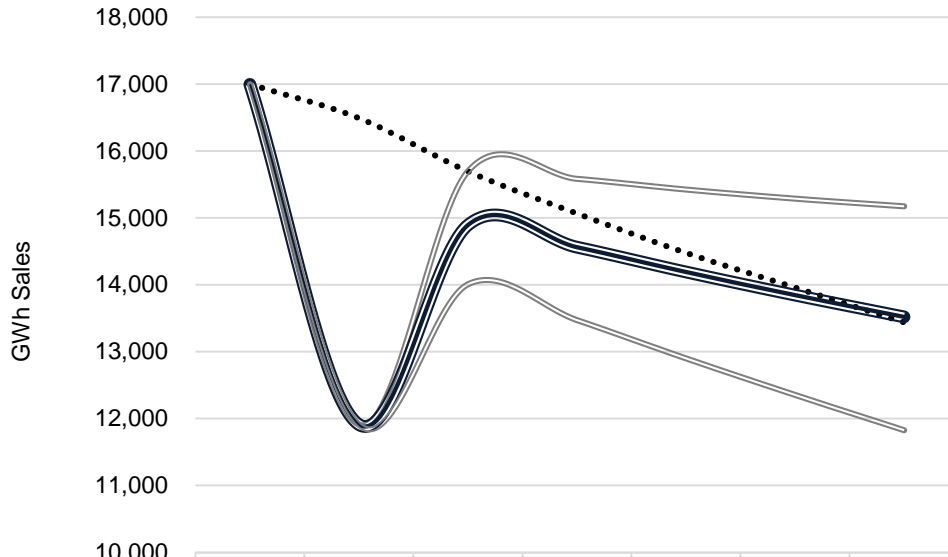
# Load Forecast Scenarios and Fiscal Plan Base Case

**REDUCED SALES / CONSUMPTION**



- Storm damage and restoration has complicated short and long term load forecasts due to uncertain impacts from secular trends in DG and EE. Scenarios were developed to test a range of possible outcomes

## LOAD FORECAST SCENARIOS



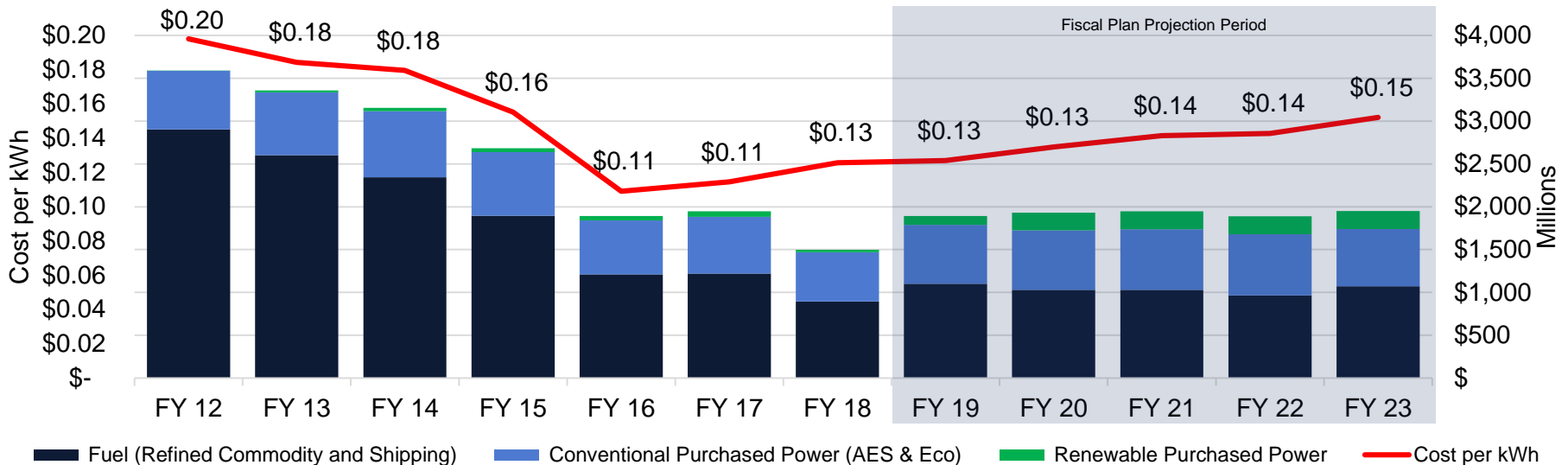
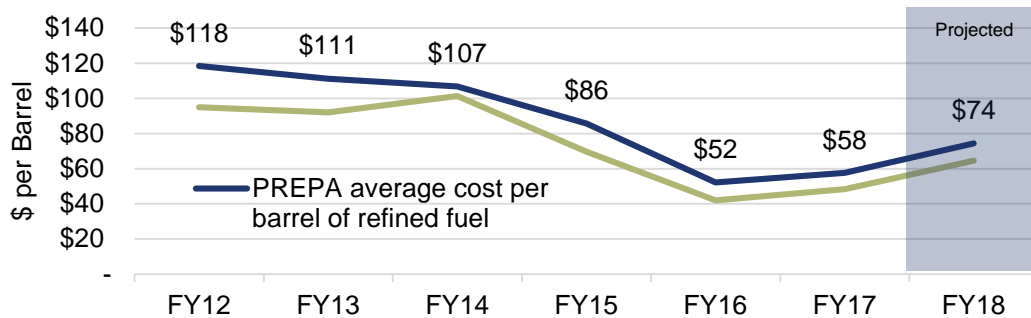
Scenario	Distributed Generation (DG)	Energy Efficiency (EE)
High	Long run 160MW capacity penetration	Assumes historical trend stays constant, no acceleration
Base	Incremental 25% of industrial load shed relative to High	30% of commercial / residential load achieves <u>30% more EE</u>
Low	Incremental 50% of industrial load shed relative to High	40% of commercial / residential load achieves <u>30% more EE</u>

	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23
..... Apr '17 Fiscal Plan	16,996	16,489	15,693	15,064	14,476	13,957	13,438
—— Upper Bound	16,996	11,910	15,697	15,583	15,423	15,287	15,172
—— Base Case	16,996	11,910	14,892	14,562	14,191	13,845	13,520
—— Lower Bound	16,996	11,910	14,008	13,472	12,901	12,355	11,828

# In Addition to the Base Rate, PREPA's Overall Fuel & Purchased Power Spend is Projected to Stay Relatively Flat

PREPA's Fiscal Plan Baseline assumes continuing to operate as a public entity and implementing the capital plan laid out in the 2015 Integrated Resource Plan, with modifications on timing and capacity due to updated load forecasts

- The fuel and purchased power forecast assumes AOGP is completed and Aguirre plants are converted to run on natural gas by January 1, 2022
- New Solar PV generation assumed: 300MW by FY 2020



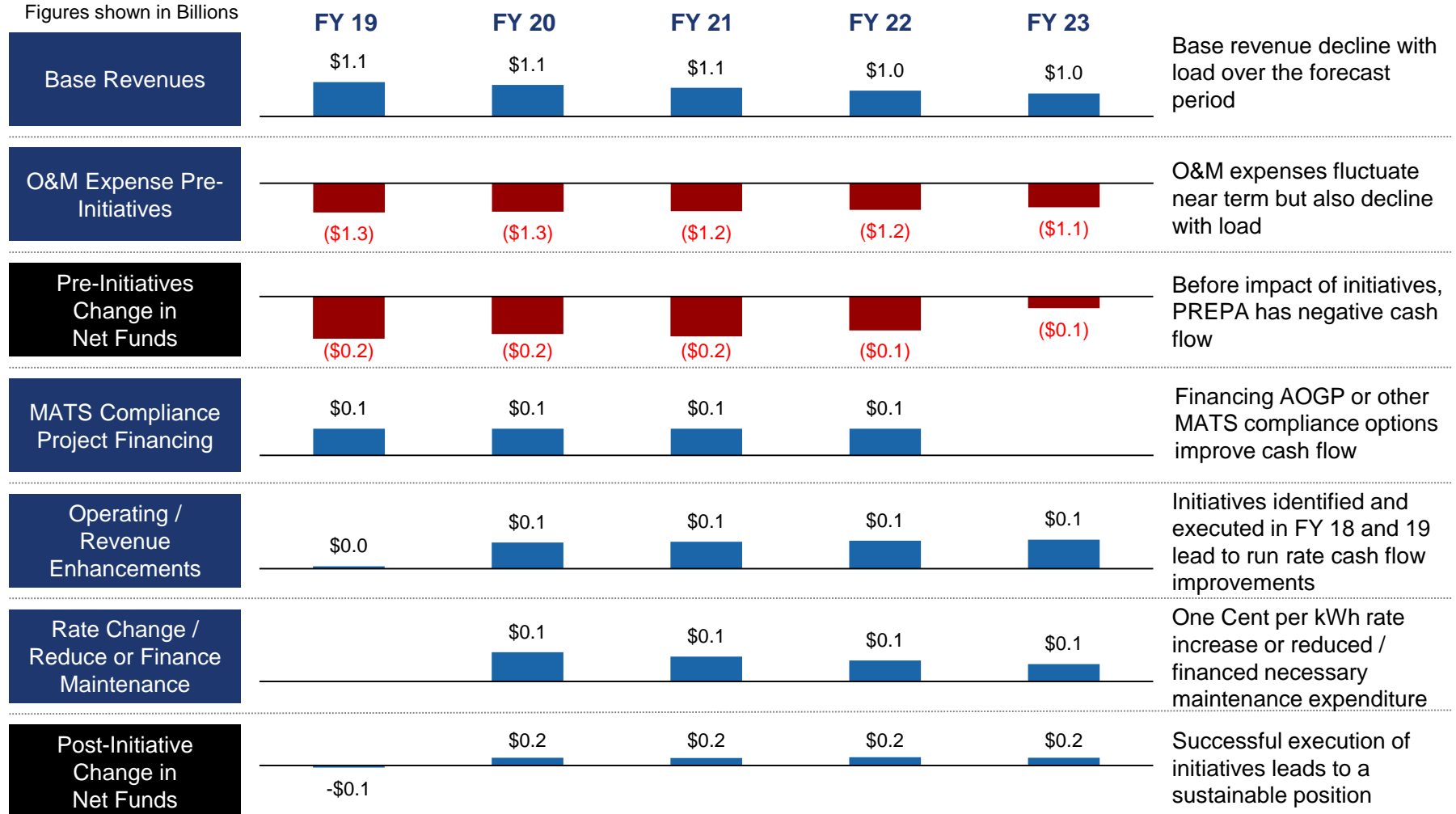
Fuel (Refined Commodity and Shipping)
  Conventional Purchased Power (AES & Eco)
  Renewable Purchased Power
  Cost per kWh

Financial projections are in preliminary form and subject to change. More detail to be provided

# Projected Base Revenue, Funding Gap, and Initiatives

To achieve neutral funding balance under the status quo, without considering legacy debt, PREPA will need to raise rates, underspend or finance maintenance. Access to capital requires successful Title III conclusion.

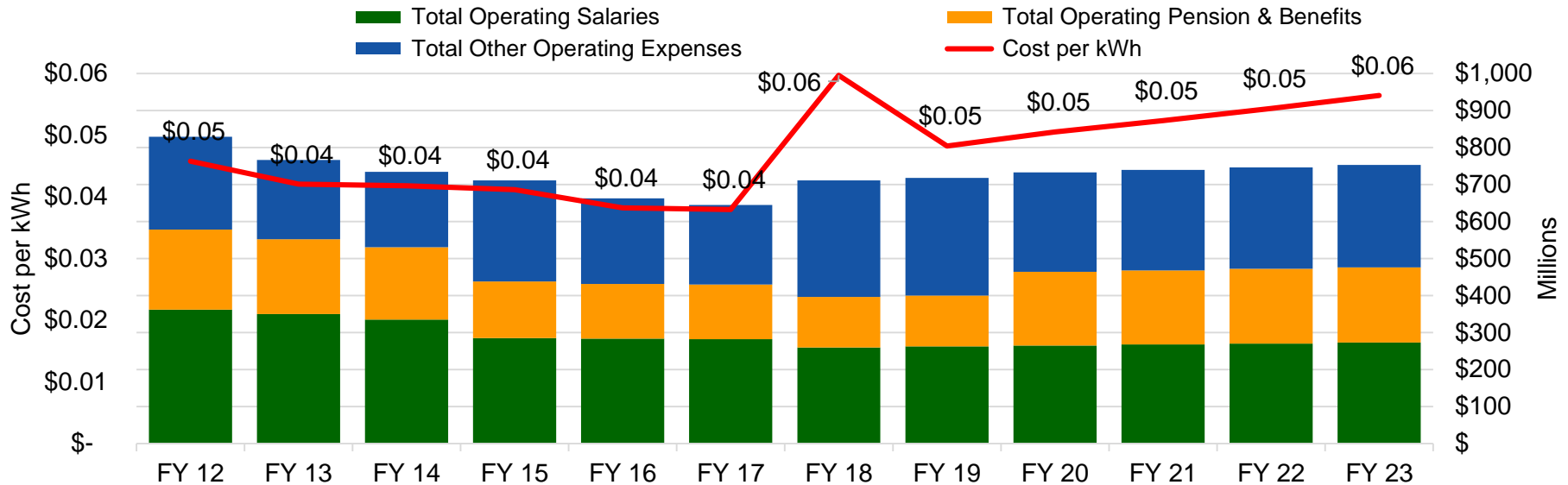
Figures shown in Billions



\*Financial projections and cost estimates are in preliminary form and subject to change.

# Historical & Projected Operating Expense

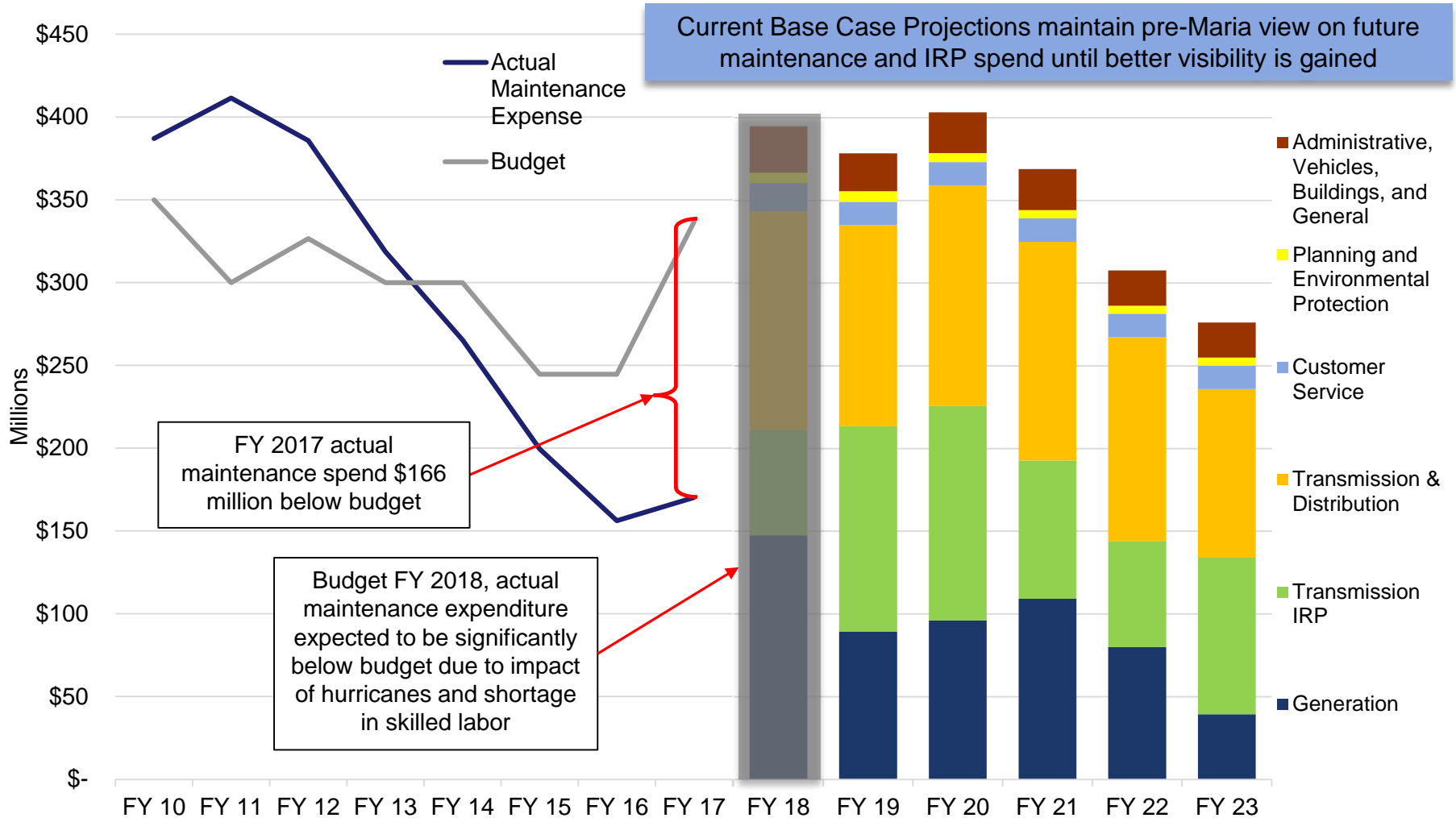
	Comments
<b>Salaries</b>	<ul style="list-style-type: none"> <li>Current headcount of 5,468 operating employees (6,285 total) is held flat through the forecast period (PREPA and advisors are analyzing labor benchmarks to determine potential rightsizing adjustments to headcount)</li> <li>Assumes 1% growth in salaries beginning in FY 2019 through the forecast period</li> </ul>
<b>Pension &amp; Benefits</b>	<ul style="list-style-type: none"> <li>Pension &amp; Benefits expenses are projected using historic spending levels plus input from the FY2018 budget</li> <li>Going forward these costs are assumed to fluctuate relative to headcount and revised actuarial numbers</li> <li>Includes retirement system (including annual additional employer contribution totaling \$60m beginning in FY 2020), health plan, social security, Christmas bonus and worker's compensation insurance</li> <li>All overtime and overtime benefits are projected separately from full-time and temporary employees</li> </ul>
<b>Non-labor O&amp;M</b>	<ul style="list-style-type: none"> <li>Comprised of materials, per diem, property &amp; casualty insurance premiums, restructuring fees, retiree medical benefits, security expenses, banking services, maintenance, utilities, and miscellaneous expenses</li> <li>FY2018 is based on budget itemized requests for non-labor/non-fuel O&amp;M expenses from PREPA's directorates</li> <li>FY2019 and beyond is projected using historic spending levels plus input from the FY2018 budget</li> </ul>



\*Additional Employer Contribution included for illustrative purposes and will be updated once update Actuarial valuation is completed.

# Historical & Projected Maintenance Expense

Since FY2013, PREPA has underspent on budget maintenance, directly impacting the reliability of the system



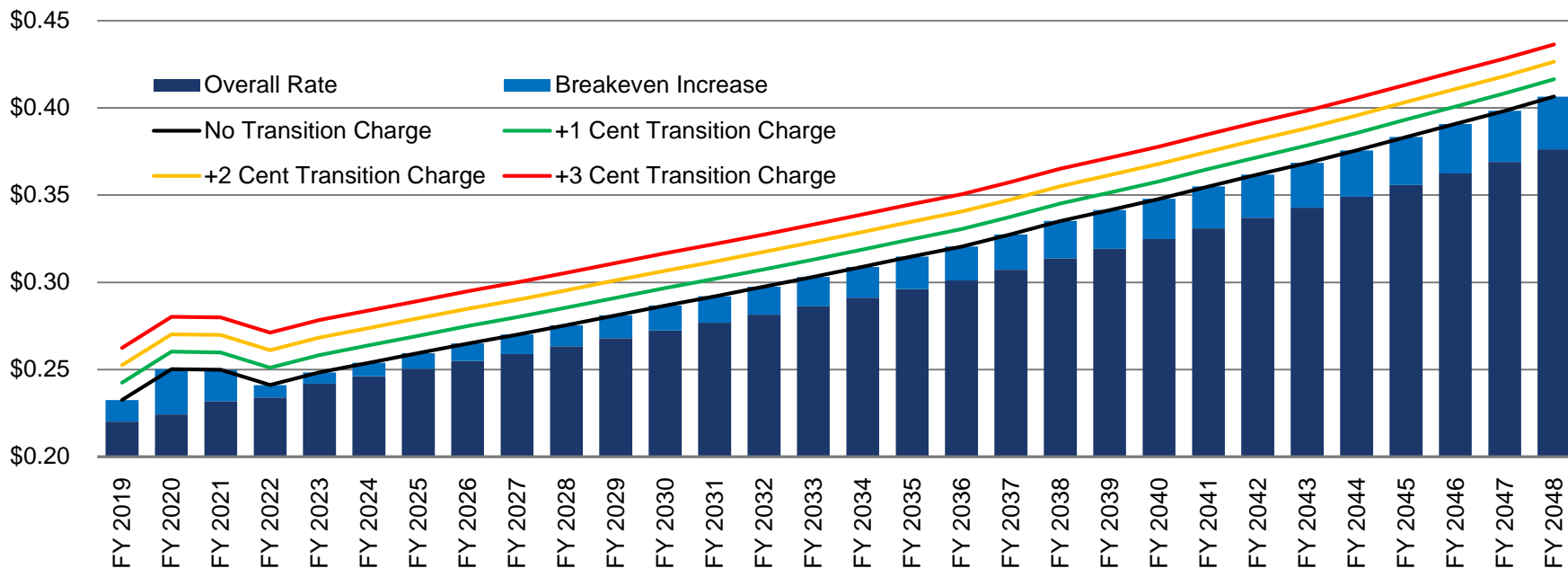
# Debt Sustainability Analysis Shows that Payment of Legacy Debt Service Requires an Additional Increase Over the Projected Base Rates

- At current rates, PREPA does not have debt capacity
- Funding pension and debt obligations on an ongoing basis will require access to capital for maintenance, reduced maintenance, or adjustment to rates

Rate Increase for Debt Service	\$0.005	\$0.010	\$0.015	\$0.020	\$0.025	\$0.030	\$0.035
Present Value of Revenue from Rate Increase (Billions)	\$1.1	\$2.2	\$3.2	\$4.3	\$5.4	\$6.5	\$7.5
Present Value of Revenue from Rate Increase (% Total Claims)	8%	17%	25%	34%	42%	50%	59%

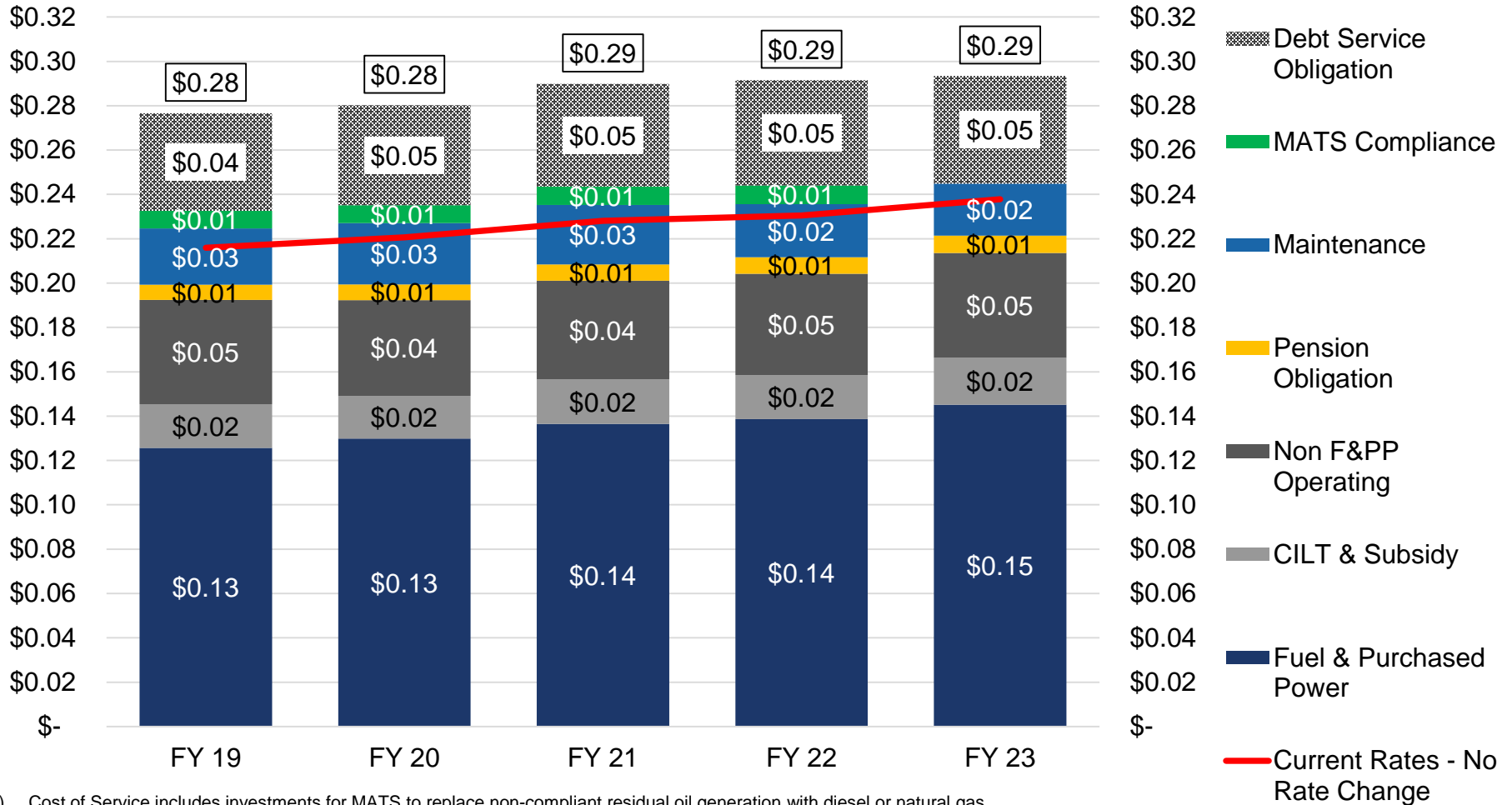
\$9.478bn outstanding debt, including accrued interest, end Fiscal Year 2017 (6/30/2017), TC revenue discounted at 5%

## Overall Rate and Required Increases to Cover Operating Shortfalls and Transition Charges



# PREPA status quo full cost of service rates are projected at nearly 30 cents/kWh

Projected cost of service rate including debt service and cost reduction initiatives identified for the 18-month period



- 1) Cost of Service includes investments for MATS to replace non-compliant residual oil generation with diesel or natural gas
- 2) Maintenance expense necessary Transmission IRP project expenditures, which are expected to be revised and updated during the IRP process.
- 3) Debt Service Obligation estimated based on term out of all long-term financial liabilities at a 5% rate over 25 years
- 4) Resolution of PREPA ERS underfunding will likely require higher contribution than indicated, actuarial study to determine full amount is in progress

## V. Macro Resource Planning

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# Levers to Decrease Fuel and Purchased Power, PREPA's Largest Cost Component

## Levers to Achieve Illustrative FY 2023 Fuel & Purchased Power Mix

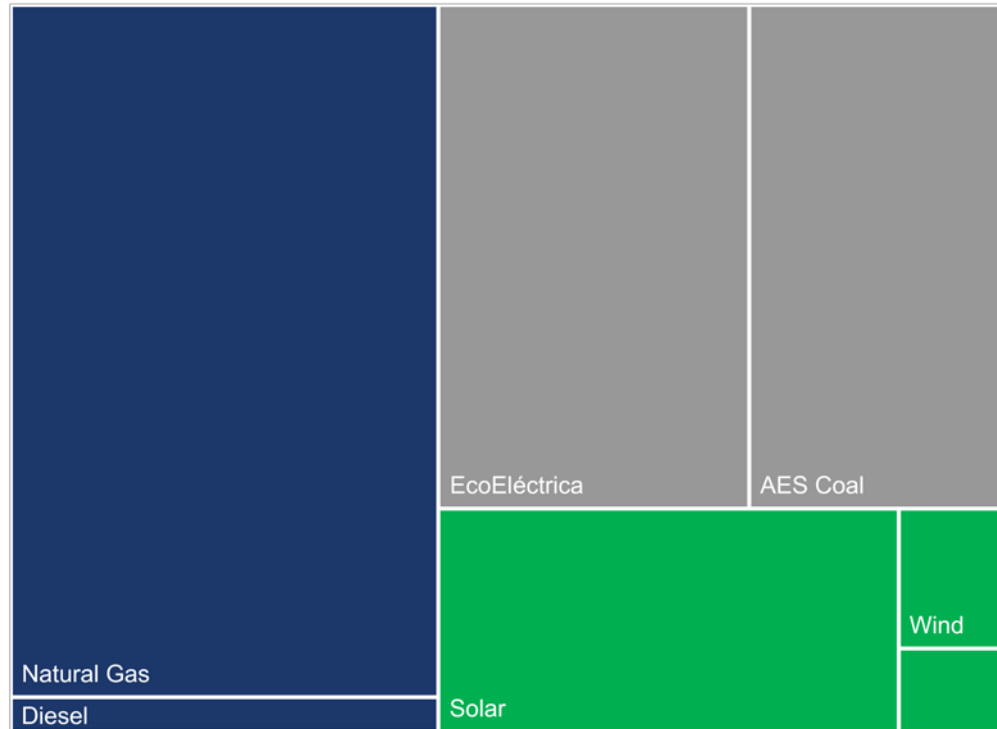
■ PREPA Fuel ■ Conventional PPA ■ Renewable PPA

### Generation Efficiency / Flexibility Investment

- Higher heat rates
- Lower cost fuel
- **Dispatch Optimization**
  - Reduce diesel burn
  - Increase baseload plant utilization

### Preventative Maintenance

- Reduce forced outage
- Improve fuel mix



### Contract Renegotiation

- Operating Fossil
- Operating Renewable
- Non-operating Renewable

### New Generation Resource Procurement

- Low cost solar
- Energy storage
- Flexible efficient combustion engines

- Reducing exposure to historically volatile fuel prices requires significant capital investment in high efficiency and stable / predictable cost generation assets
- Opportunities exist to improve costs today through operational initiatives and Title III, but the greatest opportunity lies in longer term (beyond 2023) reconfiguration of Puerto Rico generation assets through Transformation Plan

# Revised Integrated Resource Plan (“IRP”) Overview and Timeline

## Background

- PREPA was required, under Puerto Rico Act 57 of 2014, to prepare an IRP that analyzes and identifies its preferred strategy for satisfying system requirements over the planning horizon
- Main factors addressed in the 2015 IRP are reliability, stability, environmental compliance, and future renewable generation levels under market, regulatory and economic constraints
- The best performing portfolio is recommended taking into account cost, reliability, and environmental considerations based on the results of system and production cost modeling in PROMOD and PSS@E

## PREPA will analyze system requirements and market trends to develop a new capital plan

- A re-examination of PREPA’s system and capital plan is needed in light of factors like the impacts of Hurricanes Irma and Maria, lower demand forecasts, increased estimates for distributed generation, and rapidly declining costs for renewables, in order to assure that planned investments are still necessary and cost-efficient
- The need to re-build the system due to the damages caused by Hurricanes Irma and Maria represents a unique opportunity to leverage locally available renewable energy sources and battery storage capacity, and lower dependence on external fuel sources
- PREPA issued a Request for Expressions of Interest at the end of 2017 to garner interest from qualified consultants. PREPA is currently working towards completing the IRP by September of 2018 pursuant to the following timeline

RFP Process	Required Actions / Approvals	Date
RFP to Governing Board	Sent – Complete	2/27/2018
RFP to OCPC and OMB	Sent – Complete	2/28/2018
RFP Out to Bidders	Sent – Complete	3/10/2018
RFP Responses Due	Responses Received – Complete	3/24/2018
RFP Selection - <b>Delayed</b>	RFP and contract to OCPC / BOD / OMB	<b>TBD</b>
Contract Approved and Signed		<b>TBD</b>
IRP Complete		9/28/2018

# Targets/Goals for the IRP

## A NEW IRP – Focus, Goals and Targets

- PREPA will undertake an updated integrated resource plan (IRP) commencing in March 2018 for completion in September 2018.
- The purpose of this guidance outline is to understand the objective function(s) that the IRP will be optimized against.
- These guidelines will help articulate the IRP objective function(s), the relationship between the IRP and the fiscal plan, and how the regulatory process intermediates between the two.

### Overview of the Process:

- The integrated resource plan provides choices between options that are articulated as constellations of generation, transmission and distribution asset deployments over time to meet the desired objective functions and the tradeoffs between these options. PREPA will recommend asset deployment options that represent the most economically efficient, on a risk adjusted basis, approach to meeting the desired objective functions with the least amount of undesired outcomes.
- The regulatory compact, defined as the set of regulator rules that define rates, asset ownership, business model, utility services and their market structure arbitrate the translation of the integrated resource plan into both the expected rates, what costs the utility can recover, what services it can offer, and therefore, its expected financial condition. **Given the uncertainty on the future regulatory compact, therefore, it is untimely to use rates as a metric for an IRP at this juncture.**

### IRP Customer Centric Approach:

PREPA's vision sets forth a customer centric approach as one of the core vision for the future elements, along with reliability. At the most fundamental level, there are clearly distinct customer segments that place dramatically different values on power quality, power reliability and resilience. All customers demand the same levels of reliability and resiliency but different levels of power quality, depending on the end use equipment. In other words, service levels are directly dependent on the end use for the customer. As for all IRPs, the customer requirements for power reliability, quality and resilience set some of the most critical criteria for the IRP's objective function.

PREPA has generally outlined the following regarding customer requirements, and the objective function for these IRP elements:

- Large commercial and industrial (C&I) customers: particularly those in manufacturing (i.e. pharmaceutical sector) and hospitality experience significant business costs if power supplies are interrupted or are not of sufficient power quality. Therefore, the objective functions for these customers may be a N-1-1 design for the power delivery where one contingency does not lend to a total loss of service or the ability to meet peak demand
- Rural areas: the long duration of power outages is unacceptable. The objective function for these customers may be a maximum of 3 days without power for a catastrophic event, and under normal condition have N-1 reliability design criteria.
- Critical Facilities: identified in the recent DOE (Build Back Better) report, the objective function is zero critical facility days without power when faced with a total power failure, with N-1-1 reliability under normal operating conditions. Critical facilities include Police, Fire, EMS & Medical facilities with the ability to quickly connect mobile diesel generator when faced with total power loss conditions to make them operational under catastrophic failure conditions.
- All remaining customers: the objective function is a maximum of 3 days without power for a catastrophic event, and under normal condition have N-1 reliability design criteria.

# Targets/Goals for the IRP

## Focus on Meeting Customer Objectives while Minimizing Total System Costs

- PREPA's vision includes Financial Viability and Economic Engine. The IRP objective function of minimizing total system costs directly impacts these vision elements.
- The appropriate economic objective function is the total system costs, which measures all the utility and customer resources necessary to achieve the reliability, resilience and power quality objective function of the different customer segments. Total system costs include both capital, operating expenses and fuel, and given the volatility of fossil fuel, is presented on a risk adjusted basis.
- Under PREPA's cost structure, most costs (85%) recovered in rates is for fuel or purchased power. Thus, the focus of the IRP on addressing this element of the cost structure.
- There are several premises regarding the ability to reduce the fuel and purchased power total system cost significantly over the next 10 years. PREPA's view is that an IRP **objective function target would be a 30% reduction in fuel and purchased power costs vs. the business as usual case, with an additional reduction of 20% in the volatility of these costs.** Four major opportunities underlie this perspective:
  1. Reduction in required reserve margin to 50% would allow PREPA to mothball its least efficient units with the concomitant reduction in fuel costs
  2. Energy efficiency and demand response when compared with other island rural and metropolitan areas is largely untapped and reduce demand for power at typically 3 to 5 ¢/kwh, as the cost of saved energy, as well as provide dynamic load response as increased renewables enter the system or in response to system perturbations.
  3. New renewables, both intermittent and with storage, under competitive bidding process should have total delivered costs that is below the cost of oil based electric production. Solar plus storage utility and distributed scale power can be on line within two to three years—faster than most conventional generation.
  4. LNG and modernization of generation plants was shown in the 2015 IRP to be a lower cost alternative than continued reliance on oil fired steam plants. Recent market experience in comparable jurisdictions shows that major oil companies and LNG suppliers are willing to offer 10-year fixed price (hedged) contracts at prices that would deliver power at the rate of 10¢/kwh. In addition PREPA has to comply with the MATS regulatory mandate. Siting of these facilities and its impact must be studied in detail in addition to the cost savings.
- Each of these major opportunities reduces fuel costs and volatility. **That said, caution as these targets are subject to be proven or disproven by the IRP.**
- Capital requirements for generation, transmission and distribution infrastructure may increase from the business as usual case due to the need for additional physical assets to meet customer reliability, resilience and power quality needs. Since these assets could be on either the utility or the customer side of the meter, it is not yet possible to provide a credible estimate of what that increase would be.
- It is possible to recognize that the increase in capital cost is offset by the reduction in business interruption cost. Based on the aftermath of Hurricane Maria, PREPA will draw upon this experience to estimate the cost of interruption so that the capital costs can be compared against the improvement in system resilience.
- Therefore, the IRP should measure the reduction in cost of interruption at system wide level. Given the weakened state of the entire PREPA system and its vulnerability to another hurricane disruption, PREPA assumes the cost of interruption is reduced by 60% from business as usual case, particularly if the customer resilience criteria are met.

# Targets/Goals for the IRP

## Ensuring Sustainability and Protection of the Environment

- PREPA's vision sets forth PREPA being a model for sustainability as one of the core visions for the future elements. Many IRPs explicitly set the sustainability goal as a regulatory Renewable Portfolio Standard target, and make this an explicit objective function that the IRP must meet as it determines the optimal portfolio mix. This is because the RPS is a regulatory mandate. Accordingly, the IRP should set a minimum of 20% by 2030 objective function, measured as renewable generation/total generation, with distributed renewables treated as a reduction in load, unless the excess power is fed back to the grid for a small incremental cost.
- PREPA must also meet environmental compliance standards, particularly MATS, as an objective function that is a matter of compliance. In the near term, this tends to drive toward fuel switching, which depending on the fuel, can either create a savings or additional costs.

## Creating Customer Value

- Holistically, the PREPA IRP is focused on **creating customer value**, for each of the customer segments. This is an important paradigm shift from previous IRPs which focused on minimizing total system costs, as a proxy for revenue requirements.
- Priority for customers is their total bills and the uninterrupted availability of power (resilience) along with reliability and power quality. The electricity rate is of secondary importance. (If residential customer bills go down, but their rate goes up, the customers are better off. This could happen due to a combination of energy efficiency, fuel cost savings, and increased grid upgrades to improve reliability, resilience and power quality.)
- Finally, the rate PREPA charges depends entirely on the regulatory compact that exists.

## Regulatory Compact Implications to Customers and PREPA Fiscal Plan

- The current regulatory compact is not viable since PREPA can not recover its operating cost, much less earn a return on capital. Since PREPA does not set the regulatory approach, the fiscal plan will take the selected option from the IRP and show the implications of alternative regulatory approaches to both the customer and PREPA's overall financial viability. Successful mainland regulatory models should be used to redefine what an efficient regulatory compact should be to enhance the environmental, efficiency and safety regulations and to define the optimum energy cost for PREPA's customers. In other words, the current set of regulatory rules and operations must be re-vamped.
- These approaches include, but are not limited to:
  - Full Cost recovery in rates of both operating cost and return on rate base capital;
  - Differentiated rates based on service level (e.g., power quality, reliability and resilience) so that the customers desiring higher service levels pay for those services and there is no cross subsidy;
  - Allowing the utility to invest and/or operate in partnership with the customer on the customer side of the meter;
  - Allowing the customer to provide power and ancillary services to the grid from grid tied microgrids, mini grids, or aggregated distributed resources; and
  - Performance based rate incentives for operational improvements.

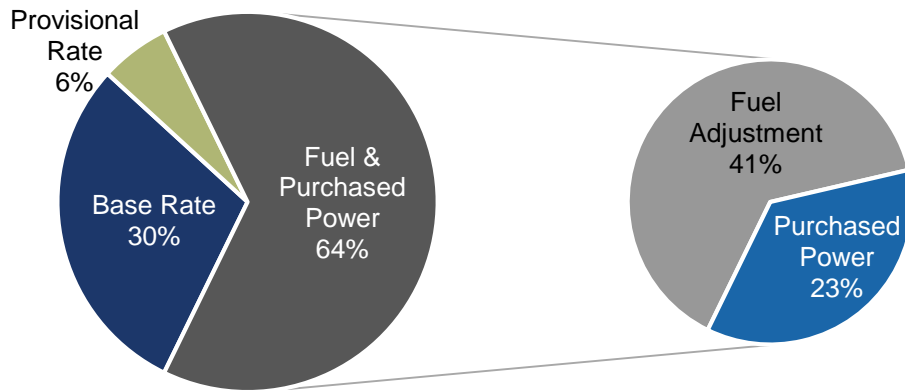
## Integration with PREPA Fiscal Plan

- **Given the complexities of the IRP process and its range of regulatory approaches, it is not possible, nor credible at this juncture to quantitatively modify the current PREPA Fiscal Plan with the IRP objective function targets.**
- Once the IRP is done, and if any of the regulatory compact issues are clarified by that time, PREPA will be able to determine the fiscal impacts of aligning to the selected IRP preferred option and whether it has the balance sheet strength to do so (whether privatized or not), or whether other partnerships with third party capital will be required.

## VI. Rate and Regulatory Structure

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# Current Rate Structure Overview



PREPA's current rate structure is composed of four primary components – Base Rate, Provisional Rate, Fuel Adjustment and Purchased Power

The 3 primary categories of customers make up 96% of revenue - Commercial (47%), Residential (37%) and Industrial (12%)

PREC approved a permanent rate structure that has yet to be implemented that would eliminate the 11% surcharge construct and instead include direct pass through line items in customer's bills to cover CILT and subsidies

(cents per kWh)	Residential	Commercial	Industrial	Overall	Comments
Base Rate Revenue	5.6	6.7	4.7	6.2	Intended to cover PREPA's O&M, not increased since 1989. Includes fixed charge (\$3) for clients on secondary distribution, and demand charges for clients served by primary distribution & transmission.
Provisional Rate Revenue	1.1	1.2	1.2	1.2	Authorized by PREC to cover PREPA's O&M deficit (\$222MM as of August 2016) during the pendency of the permanent rate case.
Base + Provisional Rate	<b>6.7</b>	<b>7.9</b>	<b>5.9</b>	<b>7.4</b>	Total rate revenue per unit sales to cover PREPA O&M
Fuel Adjustment Revenue	8.2	8.1	7.5	8.1	Fuel commodity, shipping, and other fuel related costs plus 11% surcharge intended to cover CILT + subsidies authorized by law
Purchased Power	4.8	4.8	4.5	4.8	Cost of purchased power based on contracts plus 11% surcharge intended to cover CILT + subsidies authorized by law
<b>Total Revenue</b>	<b>26.3</b>	<b>28.7</b>	<b>23.6</b>	<b>27.6</b>	
Avg. Client Bill per Month	\$87.50	\$1,202	\$60,105	\$193.67	
Share of Revenues per customer class (%)	37%	47%	12%		

Source: June 2017 Monthly Operating Report

# Rate Design Challenges & Opportunities

In the event that the Transformation Plan is not successfully executed, there are well-understood ratemaking and regulatory responses used by utilities faced with serious threats of uneconomic bypass and stranded costs.

## Potential Options that could be considered as part of rate design:

- **Adopt economically efficient rate designs.** Uneconomic incentives to bypass utility supply or delivery can be avoided or minimized:
  - Properly reflect fixed and volumetric costs in rates, and properly assign costs to classes
  - Move more costs, especially fixed network costs that do not change with customers' use, to fixed values than to volumetric costs to reduce volatility and discourage inefficient bypass
  - Consider unbundling delivery and supply rates and costs. This can help protect essential grid cost recovery and preserve funding for grid improvement and “future utility” goals. Rate unbundling also facilitates private generation investment
  - Rates that discount delivery prices without reducing grid costs must be carefully designed to promote the desired social goal (e.g., promoting renewable energy) without stranding grid costs or creating cross subsidies that hurt customers least able to respond, who are often low income or low use
- **Use targeted rate tools.** Customer or group-specific rate tools such as economic development rates, load retention rates, and special customer class (e.g., very high voltage, interruptible) rates can reduce the risk of uneconomic load loss and attract new load to areas where capacity (T&D and Generation) is available at little marginal cost. This helps the utility and the economy
- **Explicit stranded cost charges.** Impose non-bypassable charges on customers designed to recover identified categories of stranded costs. In some cases, a non-bypassable charge can reduce the incentive to depart as a means of avoiding responsibility for stranded costs



# Expense for Contribution In Lieu of Taxes (CILT) is Reasonable Relative to Mainland Public Utilities

According to an American Public Power Association study of 176 public power utilities, in 2014, public power utilities contributed 5.6% of electric operating revenues back to the communities they serve

- 88% of U.S. public power utilities with over 50,000 customers make PILOT or similar payments to government entities

Methods Used to Calculate Payments in Lieu of Taxes		
	Percentage of Utilities	Number of Utilities
% of Gross Electric Operating Revenue	22%	29
Assessment of Electric Utility and City Budget	18%	23
Property Tax Equivalent	15%	19
Flat Amount Paid Annually	12%	16
Charge per Kilowatt-hour Sold	9%	11
% of Net Utility Plant in Service	4%	5
% of Income (Net, Operating, or Total)	2%	3
Other/Did not Indicate	18%	23

Categories of Payments and Contributions to State and Local Governments	
	% of Total
Other Taxes and Fees	43.1%
Payments in Lieu of Taxes	35.6%
Gross Receipts Tax	16.1%
Free or Reduced Cost Electric Services	4.1%
Other, including Equipment and Materials	0.6%
Use of Employees	0.5%
Total	100.0%

Source: 2016 APPA Study – *Public Power Pays Back: Payments and Contributions by Public Power Utilities to State and Local Governments in 2014*

# Significant Reforms Have Removed Inefficiencies From CILT Program

**The Government of Puerto Rico has made significant changes in the treatment of the Contribution in Lieu of Taxes (CILT) by enacting Act 57-2014 and Act 4-2016**

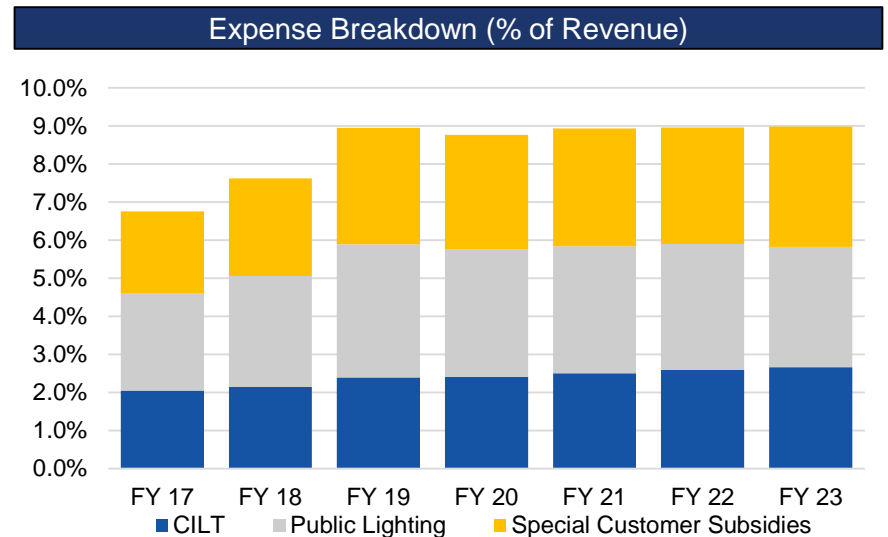
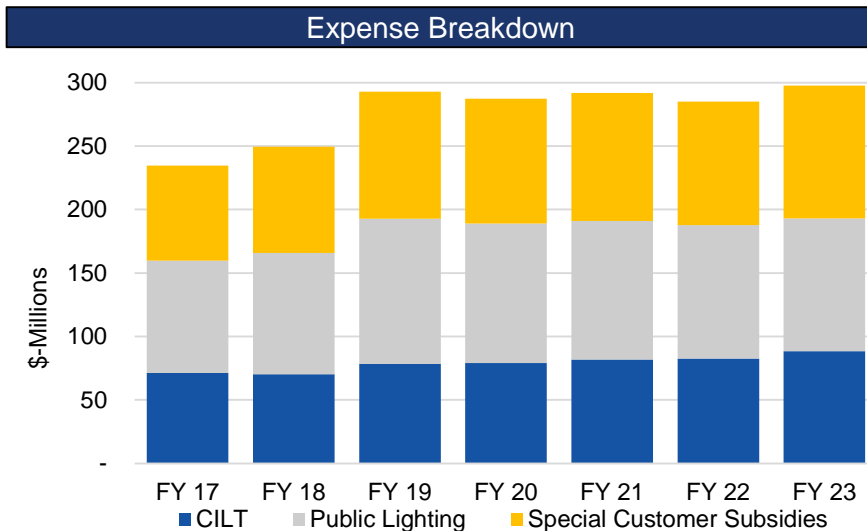
- Moving of all the municipal public lighting to the subsidies rider in the customer bill
- Removal of all municipal for-profit entities from receiving an electric service credit from the CILT
- Establishing a total consumption (kWh) cap on the municipal CILT, which will also be reduced by 15% (in three fiscal years, 5% each)
- Providing that the municipality will pay for any excess, plus the for-profit ventures
- Establishing a mechanism that promotes energy efficiency and additional savings above the mandated total consumption cap imposed on Municipalities by Act-57-2014 (i.e. 5% yearly reduction in the maximum consumption amount for a total 15% reduction over three years). Municipalities would receive a payment from PREPA for the value of the difference between the mandatory total consumption cap and actual consumption, which would only be payable if all municipalities, in the aggregate, comply with their respective consumption caps

Under the new rate structure, which will be implemented at the beginning of FY 2019, PREPA will recover the cost of CILT via the CILT rider on customer bills. Customers will have greater transparency and there will be greater accountability. Any additional reductions or amendments would require legislation

See Appendix for comparable programs and supporting data

# Background – Contribution In Lieu of Taxes (CILT)

- Currently, CILT and public lighting are recovered through an inexact and inefficient rate adjustment mechanism that changes based on Fuel and Purchased Power Expenses. This approach suffers from the following shortcomings:
  - Unless Fuel and Purchased Power expenses are sufficiently high, the compensation provided to PREPA is less than the cost of the CILT and public lighting, creating a cumulative cash deficit
  - An imprecise relationship existed between the revenue and expense streams
  - The costs of these programs were opaque and customers were not aware they were funding these programs
- As part of the PREPA Revitalization Act (Act 4-2016), the Legislature approved the full recovery of CILT, public lighting and subsidies
- The municipalities' for-profit facilities are excluded from the CILT, so municipalities must pay for this consumption. Estimated cost of for-profit municipal facility consumption that was previously included in CILT is \$21m per year
- Municipal CILT and Public Lighting are projected to be within the industry average and reasonable range of 2 – 6% of revenues. Subsidies for special customers (e.g. low income, hotels) are required by law.



Source: PREPA Planning Dept.

# Comparison of U.S. Public Power Utilities – CILT

	PREPA <sup>(1)</sup>	Average		
		<\$1bn	\$1-2bn	>\$2bn
Annual Revenue	\$3.23bn	\$645.27m	\$1.29bn	\$3.16bn
Payments in Lieu of Taxes (or other payments / services to government)	\$76.06m	\$44.37m	\$62.51m	\$342.1m
Payments to Government as % of Revenue	2.36%	7.52%	5.15%	11.07%
Sample Size	-	5	6	3

1) FY2016 figures  
Source: BAML Research

## VII. Liquidity Management

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# Cash Management Controls & Liquidity Improvement

PREPA has implemented several specific initiatives that have produced meaningful improvements to its current liquidity situation and positioned PREPA to continue to drive further progress. Current PREPA expectation is that the Company will return to cash flow neutrality (customer collections equal / exceed operating cash outflows) in the 1st quarter of FY 2019

## Fiscal Governance

- Expected hire of a Chief Executive Officer (search is down to three finalists)
- Appointment of the Chief Financial Advisor (“CFA”) reporting directly to the PREPA Board
- Creation of the Office for Contract and Procurement Compliance (“OCPC”)

## Accountability

- Applying more rigor into the evaluation of potential projects and cash expenditures
- More robust weekly reporting requirements where currently feasible
- Enhancing the planning models and tools used to evaluate PREPA activities

## Cash Management Controls

- Monitoring of liquidity, cash receipts and disbursements; weekly forecast to actual variance analysis
- Cash distribution controls; CFA approval required for all disbursements greater than \$2 million and for the classification of all Eligible Uses pursuant to the Government loan
- Efforts to maximize federal funding available for disaster recovery

## Increasing Collections

- Collaboration between PREPA & Government agencies, which resulted in approximately \$100M of accelerated collections and prepayments for future power deliveries in December 2017 and January 2018
- On-going discussions with public corporations to validate / determine potential collections of past due amounts
- Testing market appetite for potential prepayment plans with industrial clients

## Managing Fuel & Purchased Power

- Managing generation fleet resources with a view to optimizing economics when the transmission grid allows
- Operating the power grid with a lower level of spinning reserves, improving dispatch
- Negotiations with multiple vendors resulting in delayed cash outflows

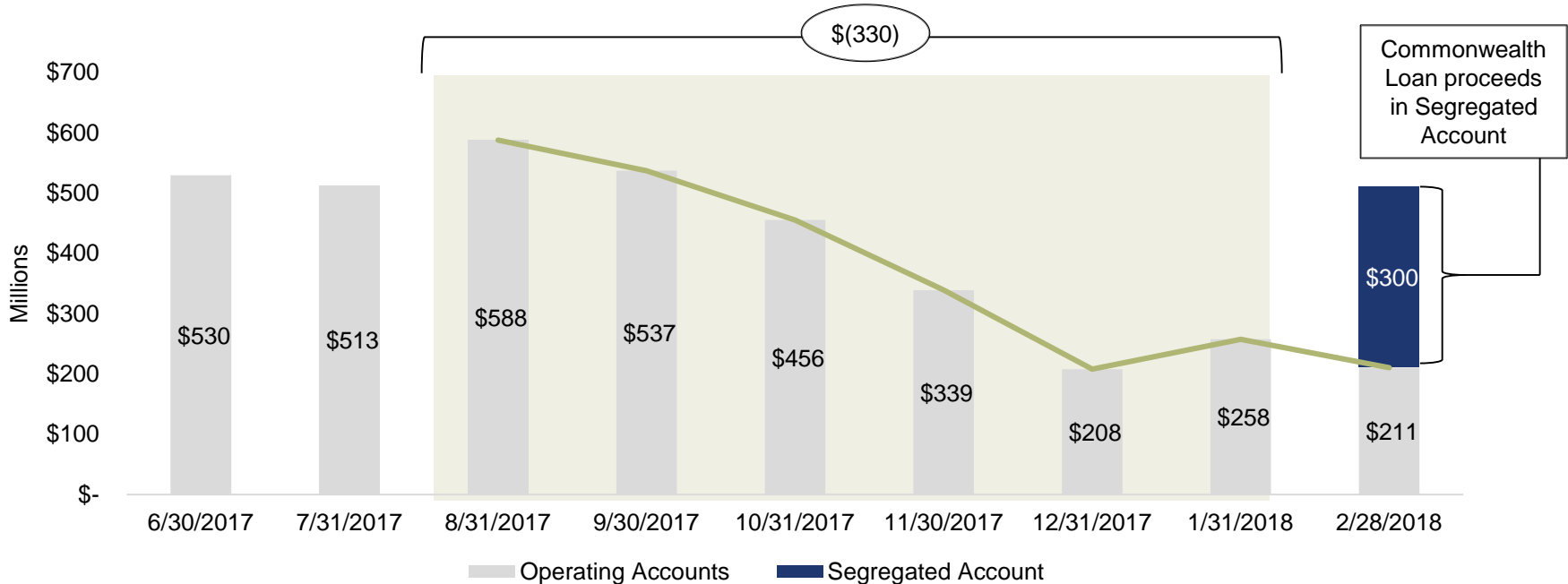
## Other Initiatives

- Managing the FEMA reimbursement process; delay in payment to restoration vendors until PREPA collects the reimbursement funds from FEMA
- Establishing the actual validated claims for storm related insurance matters, and eventual collection of these funds
- On-going effort to evaluate options and execution tactics related to material changes in staffing levels and capabilities

# PREPA Bank Balances – Operating and Segregated Accounts

## *PREPA'S operating cash balance has significantly decreased following the impact of Hurricanes Irma and Maria*

- PREPA's Operating accounts cash balance declined by \$330M from Aug 31<sup>st</sup> through Jan 31<sup>st</sup>, 2018, and declined an additional \$47M from Jan 31<sup>st</sup> through Feb 28<sup>th</sup>
- The use of cash during the period was primarily driven by lower than normal customer collections due to the impact of Hurricane Maria, payment of Employee Disbursements (including Overtime related to the emergency), Energy Purchases (Fuel), Emergency Spend and Other Disbursements
- On Feb 23, 2018, PREPA received a \$300M emergency loan from the Puerto Rico Treasury Department ("Commonwealth Loan") to provide short-term liquidity relief and enable it to continue operations
- PREPA's combined Operating and Segregated account bank balance at 2/28/18 was \$511M



Note: Operating Accounts include General Fund, Working Fund and Revenue Fund accounts.  
 Note: Operating Accounts balance excludes PREPA deposits held at GDB

## VIII. Labor and Pensions

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# Background on Labor and Pensions

Improvements to the Collective Bargaining Agreement are necessary to operate PREPA in an efficient manner and PREPA will engage actively with the Unions to address such improvements

## Labor

- PREPA's work force is over 70% unionized and belongs to 4 different Unions (source: PREPA Personal Directorate February 7, 2018):
  - UTIER – 3,555 Employees
  - UEPI – 284 Employees
  - UITICE – 592 Employees
  - UPAE – 5 Employees
- All union contracts are arguably in effect continuing under a questionable evergreen clause; PREPA Management believes work rules and CBA articles hinder efficiency
- The union contracts include narrow work rules that, among other things, prevent PREPA management from efficiently deploying and supplementing human resources in an efficient manner
- PREPA is understaffed in certain high skilled functions, partially due to a wave of retirements in 2017 (which is spilling over into 2018)

## Pension

- PREPA's pension is underfunded by \$3.6B based on estimates from February 2018 using the 2014 Actuarial Report data
- PREPA's retirement system has differing benefits dependent on start date
  - Employees who started with PREPA on or before Dec 31, 1992:
    - Paid 75% of average of highest three years of service annually
  - Employees who started with PREPA after Dec 31, 1992:
    - Require 30 years of service and being older than 55 to retire with full pension benefits; Paid 75% of average of highest three years of service annually (capped at \$50k)

## Labor: Right Sizing Plan Needs to Consider Critical Needs in Operational Areas

- Prior to the hurricanes, PREPA already faced a shortage in skilled workers, particularly in Generation, T&D, Customer Service and IT
- The emergency and stabilization headcounts in the chart below represent needs identified by Directorate heads for emergency and stabilization purposes unrelated to the hurricane and as of mid-August 2017
- The staffing ramp-up will be dependent on a variety of factors:
  - Constraints related to outsourcing contracts imposed by applicable law (e.g., Act 3-2017) and CBAs
  - Identifying candidates with the right skill sets
  - Impact of announcement of sector transformation
  - Unpredictable retirement patterns
    - 585 PREPA employees had filed paperwork to retire as of February 2018, per the Retirement System records
    - Employees can elect to halt the retirement process after submitting paperwork
- **Headcount excluding hurricane relief workers is down to 6,107 as of mid December 2017**

		Directorate	Jun-17	Emergency	Stabilization	Total E&S	Ending Headcount
		Generation	1,411	386	0	386	1,797
		Transmission and Distribution	2,512	230	106	336	2,848
		Customer Service	1,239	86	143	229	1,468
Targeted areas for re-engineering and business process outsourcing.		Operations Support <sup>1</sup>	420	65	1	66	486
		Executive and General Administration <sup>2</sup>	251	0	0	0	251
		Human Resources	144	0	0	0	144
		Finance	118	0	0	0	118
		Planning and Environmental Protection	64	0	0	0	64
		Legal	54	0	0	0	54
		Governance Board	3	0	0	0	3
		<b>Total</b>	<b>6,216</b>	<b>767</b>	<b>250</b>	1,017	<b>7,233</b>

<sup>1</sup> June 2017 headcount by sub-division: Ground Transportation (178), Supplies (171), Ops & Infrastructure (52) and Operational Safety (19)

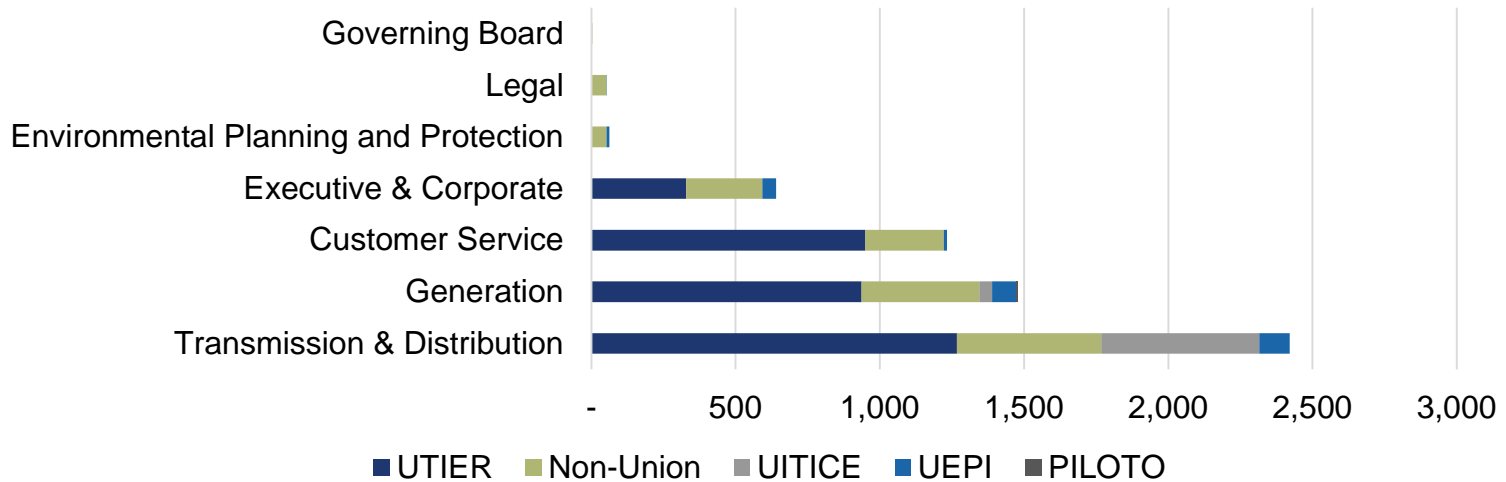
<sup>2</sup> June 2017 headcount by sub-division: Corporate Strategy (104), General Services (75), Retirement System (39), Executive (33)

Source: PREPA HR Directorate

# Addressing Labor Reform

Task / Phase	Description	Target Dates
Development of Efficiency Optimization Plan	Prepare a framework for discussion with the Unions regarding the impact on labor of an the efficiency optimization plan	June 15th
Discussions with Union	Participate in discussions/negotiations with the Unions around how to accommodate the efficiency optimization plan and the needs of labor going forward	July 15 <sup>th</sup>
Implement Efficiency Optimization Plan	If an agreement is reached, then implement negotiated terms	TBD
Implement Tittle III Restructuring Option	If unable to reach an agreement, then develop a restructuring plan under Tittle III and begin process to implement plan	TBD

### Headcount by Union Status and Directorate



Note: The above proposed timeline is subject to change based upon the ability to reach an agreement with the Unions

## Addressing Pension Reform

- PREPA's Employee Retirement System ("PREPA ERS") is designed to meet the defined-benefit pension and other post-employment benefits ("OPEB") obligations of PREPA's active and retired employees (including beneficiaries)
- The PREPA ERS is significantly underfunded and PREPA is in the process of requesting from the ERS information to update these assumptions and projections
- OPEB (\$384m accrued) is entirely unfunded as reported in PREPA's 2012 "Report of Actuary on the Other Post-Employment Benefit REVISED Valuation", revised as of October 2015
- A pension consultant was retained by PREPA and began a formal Actuarial Review process in January, 2018 to update the actuarial report, which will include: Current state of pension plan funding, and assessment of liabilities, expenses and cash flows

Develop Fact Base



Define Strategy and Execute

- Using the pension consultant's work as a fact base, PREPA will seek to work with the PREPA ERS to define and pursue a strategy to address retirement system reform
- Pension reform needs to be addressed as part of the overall transformation of the energy sector. There are a variety of ways under which legacy pension obligations can be addressed in a sustainable manner as part of energy sector transformation efforts.

PREPA is working closely with its Financial Advisors and Counsel to obtain information needed for the Actuarial Review. As of March 1, 2018, the Retirement System had refused to provide detailed census level data.

# Pension Consultant Proposed Project Plan

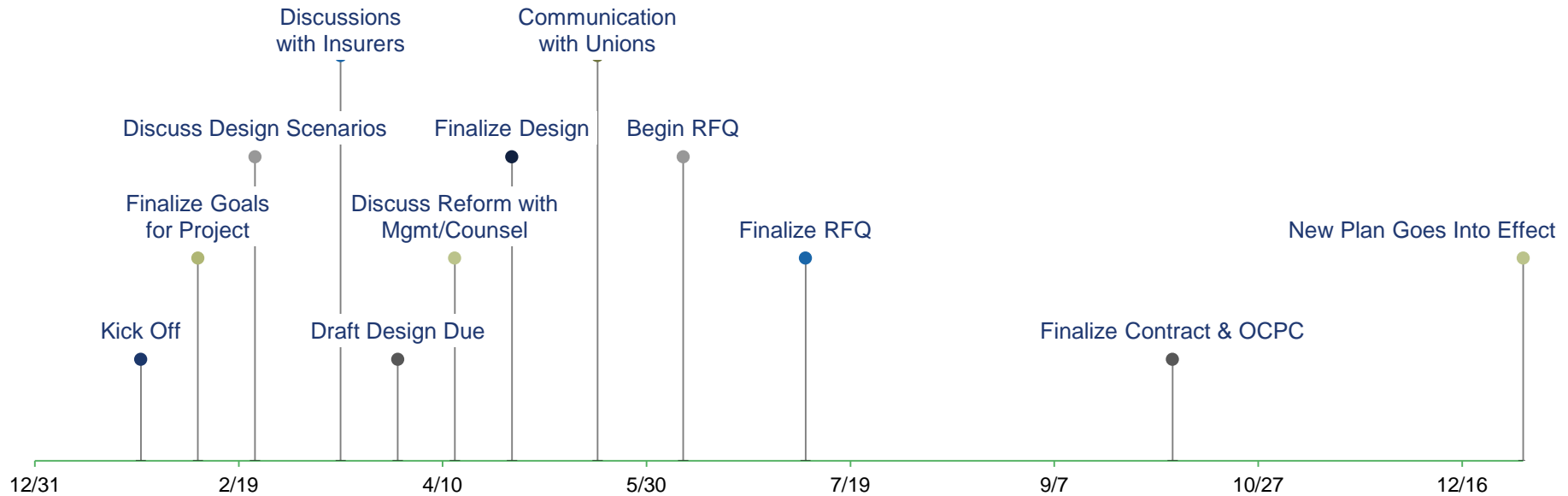
Task / Phase	Description	Target Dates*
Receive data from actuary	Receives all requested data from actuary including final reconciled data and detailed assumptions.	Apr 13 <sup>th</sup>
Receive data from PREPA	Receives all requested data from PREPA including updated census and claims info.	Apr 13 <sup>th</sup>
Assumption Review	Review experience studies, demographic and economic assumptions in comparison to public peers. Evaluate impact of plan freeze or reductions in benefits on assumptions.	May 18 <sup>th</sup>
Assumption Review and Plan Design Kick-off Meeting	In-person meeting to present assumption review, discuss status of replication and begin plan design/funding discussions.	May 28 <sup>th</sup> -31 <sup>st</sup>
Initial Set-up and baseline projection	Collect reconciled data from prior valuation. Program valuation system to replicate Pension and OPEB results. Correspond with actuary to resolve discrepancies. Develop 30 year initial baseline and deterministic projection.	June 13 <sup>th</sup>
Update data	Scrub and reconcile updated census data. Correspond with PREPA to resolve census data discrepancies. Analyze updated claims experience. Correspond w/ PREPA or insurance carrier regarding claims. Prepare updated claims to use. Update 30 year initial baseline and deterministic projection.	June 27 <sup>th</sup>
Sensitivity analysis	Determine impact on liabilities of changes in: discount rate, investment return, mortality, retirement, turnover, disability.	July 11 <sup>th</sup>
Baseline projection, Sensitivity analysis and Plan Design Meeting	In-person meeting to present baseline projection, sensitivity analysis and continue plan design discussions.	July 16 <sup>th</sup> -20 <sup>th</sup>
Plan Design and Scenario analysis	Determine long-term impact of some or all of the following options: reducing benefits for active employees, reducing benefits for retirees, increasing contributions, increasing investment return.	August 22 <sup>nd</sup>
Plan Design Meeting	In-person meeting to present plan design options including impact on participants.	August 27 <sup>th</sup> -31 <sup>st</sup>

**\*Target dates assume all data is received by April 13<sup>th</sup>. Given the current lack of cooperation on data sharing by PREPA ERS, timelines may need to be revised.**

# Medical Benefits

- PREPA is working with its medical benefits broker, Essential Insurance, to substantially reduce healthcare costs in fiscal year 2018-19
  - In the interest of executing self help measures, PREPA plans to reduce the annual cost of its healthcare plan for active employees

## Timeline:



## IX. Post-Certification Reporting

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# Post-certification reporting requirements

## Requirements end upon exit from Title III

Report type	Detail	FOMB reporting cadence	Public reporting deadlines
<b>Liquidity tracking</b>	13-week cash flow report including all receipts and disbursements, accounts receivable, accounts payable, and restoration report as outlined in Commonwealth loan agreement	Weekly until restructuring, bi-weekly thereafter	Monthly upon FP certification
<b>Budget to actuals</b>	<p>Tracking of budgeted to actual cash flow per budget certification agreements with FOMB package to</p> <ul style="list-style-type: none"> <li>▪ Include explanation for material variances (&gt;10% and \$30 million)</li> <li>• Include I/S in the reporting package</li> <li>• Provide monthly reports required pursuant to the terms of the <i>Superpriority Post-petition Revolving Credit Loan Agreement, by and between Puerto Rico Electric Power Authority, as Borrower, and Commonwealth of Puerto Rico, as Lender</i></li> </ul>	Monthly after budget is certified	Monthly reporting of headline I/S numbers consistent with prior public reporting on website; B/S reported once per year. Begin upon budget cert.
<b>Cash management measures implementation schedule</b>	Provide updates on new and in-progress cash management measures targeting near-term financial stability to the FOMB	Varies by report	N/A



# Post-certification next steps and milestones

## Reports and Targets Dates

Report type	Detail	Target date
<b>Integrated Resource Plan</b>	Begin and complete new IRP in calendar year 2018	New process by end of Q4 FY2018; complete IRP by beginning of Q2 FY2019
<b>Pension sizing and reporting</b>	Update projected costs of pension liabilities and costs	3Q 2018 (1Q FY 2019)
<b>Work Plan 180 tracking</b>	Provide summary of Work Plan 180 findings and define milestones for improvements based on results	One-time, then as defined by findings
<b>FP measures implementation schedule</b>	Development of FP initiative timeline (e.g., list of all actions PREPA has to take in order to realize baseline projections + measures)	Development 1-month post certification; subsequent monthly reporting
<b>Contract evaluation</b>	Evaluate all PPOAs and existing contracts to determine long-term strategic corporate benefit, or potential options for renegotiation or rejection under Title III	4Q 2018 (2Q FY 2019)
<b>CILT updates</b>	Execute CILT reforms described in the Rate & Regulatory Section and provide a summary of corresponding cost reductions and collections from municipal customers benefitting from CILT	4Q 2018 (2Q FY 2019)

## X. Transformation Plan Detail

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# Transformation Plan Table of Contents

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- A. Generation Transformation and T&D Concession Structure
- B. Criteria for Private Partners
- C. Proposed Regulatory Framework
- D. Federal Funding
- E. Grid Resiliency
- F. Transformational Operational Initiatives

# The Path to Long-Term Financial Stability

The path for Transformation of PREPA has changed significantly as a result of Hurricanes Irma and Maria

## 1 LOAD & FINANCIAL PROJECTIONS

### Updated Load and Financial Projections are needed to account for changes in economic outlook

- Updated load forecast accounting for updated macro assumptions
- Uncertainty exists as to revenue trends, and new base case given population trends and increased technological disruption (e.g., DG and Co-Gen)

## 2 COLLECTIONS & REVENUE

### Steep reductions in collections and revenue have occurred due to prolonged storm outages.

- Over a 6-month period, PREPA drew down cash balances to critically low levels, and there is continuing uncertainty around future collections
- Near-term liquidity has been authorized and obtained

## 3 REBUILD & RESILIENCY

### Comprehensive rebuild and resiliency to avoid future prolonged outages

- Need for a grid that is thoughtfully planned, well maintained and safely operated to achieve defined reliability goals
- Need to balance reliability/resilience and cost objectives while also taking advantage of advancements in technology and innovation

## 4 OPERATIONAL BASELINE

### Operational and structural measures are being designed and analyzed

- Integrate implementable cost initiatives related to major cost drivers to achieve lowest possible compliant rate while ensuring reliability and power quality standards (i.e. dispatch improvements)
- Initiatives to reduce forced outages and spinning reserves to improve fuel consumption and cost
- Organizational restructuring for enhanced productivity and more efficient business processes

## 5 TRANSFORMATION OF THE SECTOR

### Analysis and development of a transformation of the sector is underway

- The new reality of post-storm transformation will consider ways to best leverage federal funding
- A new IRP process is commencing to reassess resource needs under a new set of load scenarios to achieve long-standing goals such as system reliability, fuel diversification, and renewables integration

## A. Generation Transformation and T&D Concession Structure

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# PREPA Post-Transformation Future Scenarios

PREPA is in the process of developing realistic scenarios and forecasts for Post-Transformation and for analysis in the 2018 IRP process, and has developed initial views on cost potential

Power generation capacity projections that include significant low cost renewable power generation must include necessary upgrades to generation and T&D to meet acceptable reliability criteria

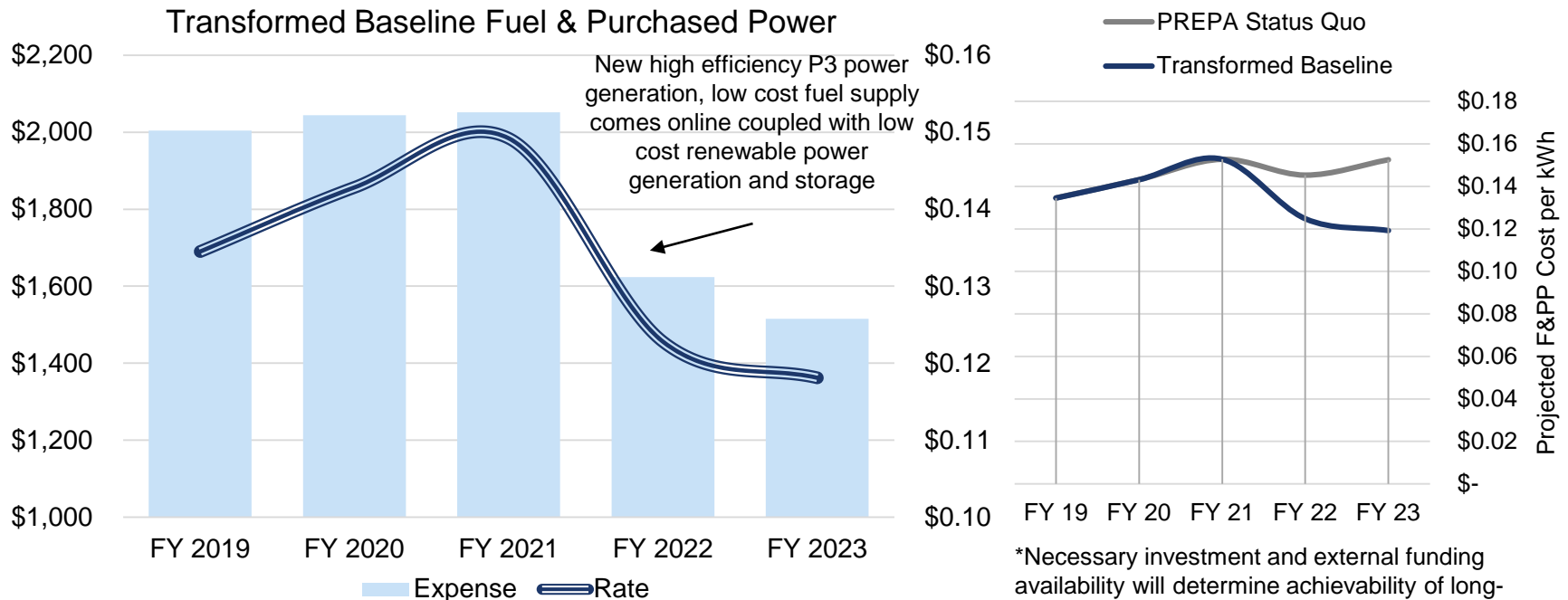
FY 2023	Goals / Target*	Comment / Constraint
Resource Expansion Focus	Reliability & Resiliency	PREPA IRP principles seek to achieve lowest rate in compliance with reliability and environmental criteria
Fuel & Purchased Power Cost Reduction	20-25%	Driven by aggressive declines in capital cost projections
Renewable Generation	20-25%	Major upgrades to generation + T&D system required to support 25%; increasing reliability issues at >25%
Clean Low Cost Fuel Supply	20-30 TBtu / Yr	New and existing options to be analyzed and compared
Reciprocating Engines	500 MW	Flexible fast response generation for system stability
Battery Storage	100–600 MWh	For voltage support / frequency regulation and load shifting
Generating Unit Retirements	TBD	Reliability and black start issues must be considered
Investment (Generation, Fuel Supply)	\$3.3 Billion	Significant dependency on federal funding for T&D and private investment in overall system

\*These aspirational targets can be potentially achieved, but only after securing substantial resources for T&D and Generation improvements before and after FY23 Preliminary scenario still under development, and will be thoroughly analyzed through the IRP process running between March and September 2018

# The Aspirational Transformed Baseline Scenario Improves on the Status Quo

The preliminary generation capital spending plan for the Transformed Energy Sector to be studied in the IRP envisions achievement of a lower overall rate through efficient, flexible generation and diverse, energy fuel sources

- Preliminarily, a 20-25% reduction (\$400 - 500 million) in fuel and purchased power cost from the \$2 billion per year currently spent under normal operating conditions (pre-storm or post restoration) is an aggressive but potentially realistic target for FY2023 (~12 cents)
- Reductions in these costs beyond 25%, up to 50% may be possible within a 10-year time horizon, with adequate Generation and T&D investments\*
- Increasing renewable generation beyond targeted levels of total generation may also be possible within a 10 year time horizon, again, with sufficient upgrades to the overall system that require substantial near term capital investment

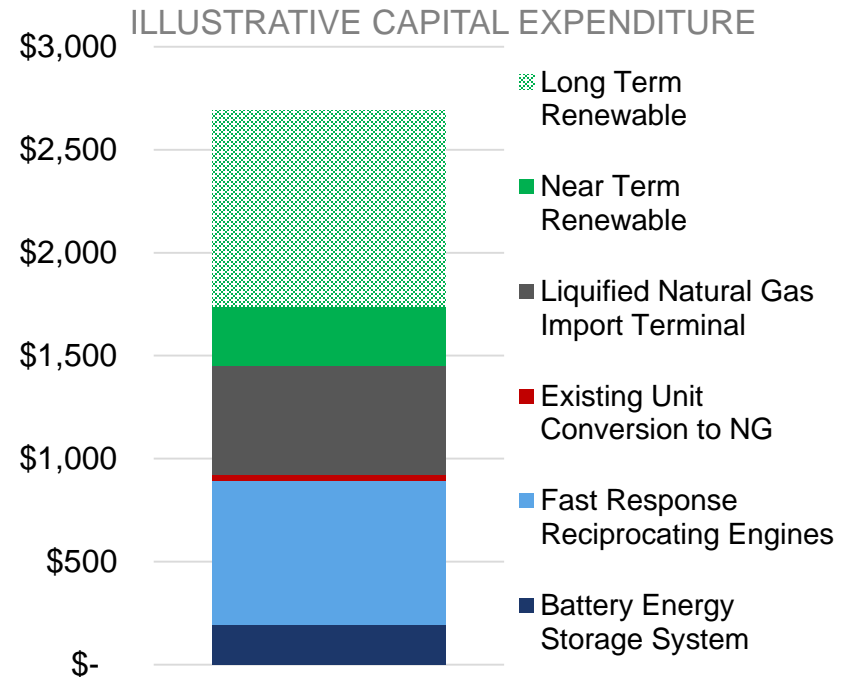


\*Necessary investment and external funding availability will determine achievability of long-term goals

# 2018 IRP: Post-Transformation Future Scenarios

PREPA is analyzing technologies and concepts to achieve the lowest cost rate that meets minimum reliability and environmental compliance criteria

- Technologies currently under review and analysis include:
  - > Reciprocating engines – fast-response, moderate efficiency, multiple fuel input capability → reliability / flexibility
  - > Solar PV – low cost, no variable fuel component, can reduce fuel burn if planned properly → cost / environmental
  - > Wind, & Other Renewables – low cost, no or low variable fuel component → cost / environmental
  - > Battery Storage – reliability in case of power plant outages, load shifting for low cost generation → reliability
  - > Combined Cycle Generating Turbines (CCGT) – high efficiency → baseload / cost
  
- System design improvement concepts being studied now and in the IRP, including, but not limited to:
  - > Reducing the size of PREPA’s largest unit to reduce the requirement for spinning reserves and increase heat rates across the generation fleet
  - > Adding flexible generation and battery storage to limit the need for spinning reserves at low efficiency plants
  - > Conversion of Northern plants to natural gas and pursuing a low / alternative fuel supply strategy
  - > Southern plant repowering and gas supply expansion at Costa Sur, Aguirre Offshore Gas Port (AOGP), and other natural gas supply opportunities
  - > Solar plus storage peaking unit additions and substitution for existing fossil generation
  - > Demand response and distributed generation dispatch control resource development and procurement



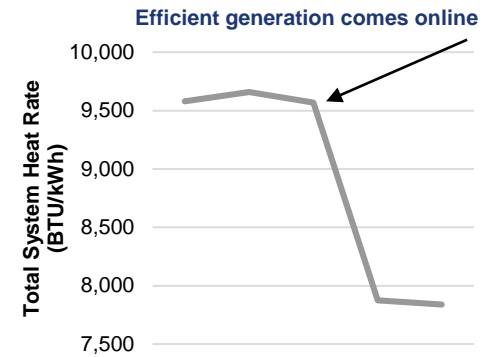


# Assessment and Development of a Sequenced Roadmap for Achieving MATS Compliance and Generation Modernization is Underway

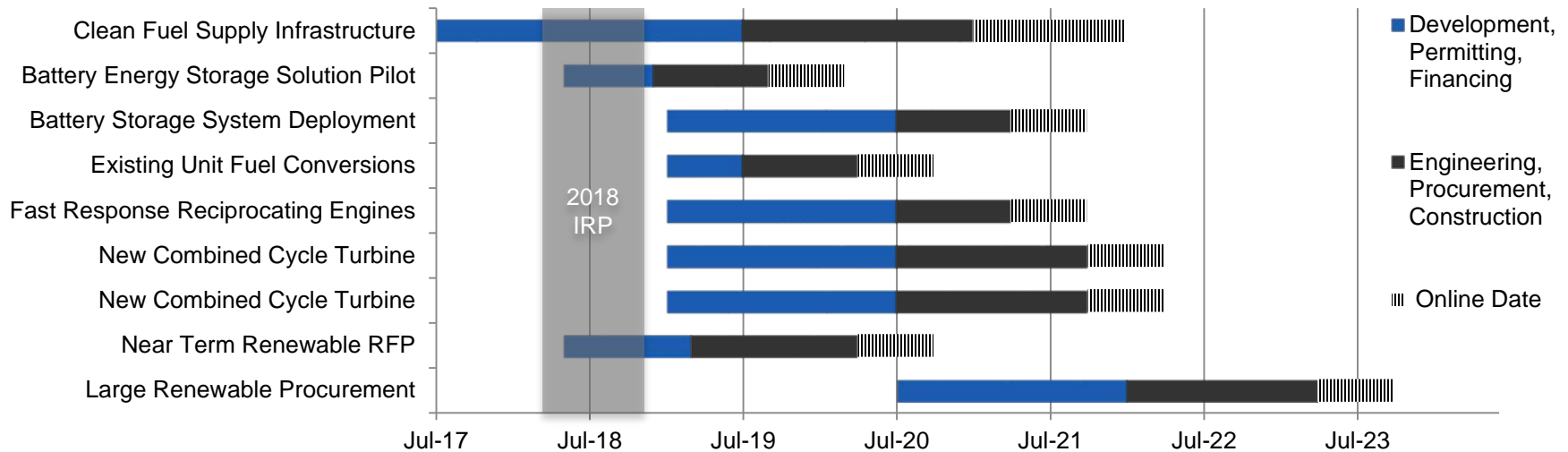
PREPA is preparing to reassess its capital spending plan to ensure MATS compliance and reliable, efficient generation.

## Long term power system goals include:

- Retirement of old and inefficient units, and repowering and replacement of generation assets through privatization to reduce fuel expense, system heat rate, and exposure to volatile fuel prices, and to improve system flexibility to integrate renewable resources
- Construction of Clean Fuel Supply Infrastructure such as the Aguirre Offshore Gas Port (“AOGP”) and other options for MATS compliance and generation system efficiency
- T&D system hardening to ensure that the electric grid is reliable and resilient against future atmospheric events, and capable of handling variable customer load and generation from renewables and distributed resources



## ILLUSTRATIVE Capacity Expansion Plan – TO BE REVISED POST IRP



\*All of the above is subject to the new IRP process, the findings from the IRP will serve as a baseline to analyze bids for Energy Sector Modernization through privatization or concession structures

## Base Case Illustrative End State Structures for Transformation\*

### T&D Concession

- Delivery and retail utility functions provided by single private concessionaire using publicly-owned wires and retail service assets subject to conditions and rate and performance regulation
- Concession awarded via competitive process
- Concessionaire must make and fund necessary investments not otherwise publicly funded; title to all assets remains public
- Concessionaire receives retail rate revenues set generally under established rate standards
  - Rates recover prudent operating and supply costs
  - Rates include return of/on cost of new investments
  - Potential return on value of other assets and recovery of unrecovered investment costs at end of concession term linked to investment obligation
  - Performance on metrics and incentives can also affect rates and revenues
- IRP and Renewable Portfolio Standard (RPS)
- CPCNs for major investments not authorized by statute, franchise, investment plan, or IRP

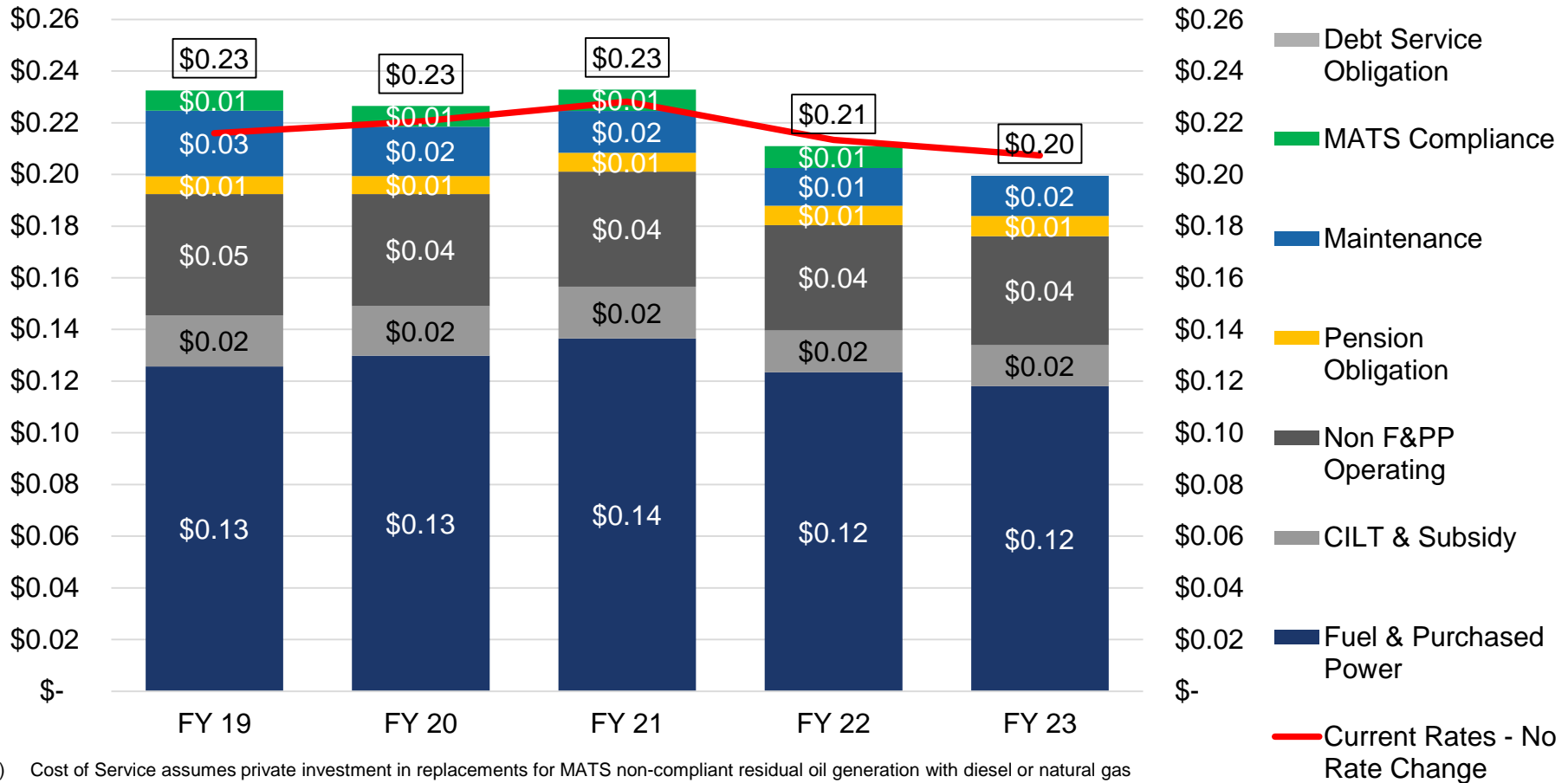
### Generation sale

- New franchises created for one or more privately owned generation companies
- Generation franchises create right to operate utility scale generation and sell to delivery utility
- Franchisees can acquire useful generation assets now owned by PREPA under Title III process
- CPCNs for major new investments not authorized by statute, franchise, investment plan, or IRP including new competitive utility-scale generation
- Energy sales can occur through negotiated contracts (PPOAs) subject to market power test and backup regulation
- Migration to other market structures (e.g., periodic auctions) possible if and as future market develops
- IRP, objective performance standards, reserve requirements, and Renewable Portfolio Standard regulations apply
- Regulation of subsequent purchases / sales / reorganizations under traditional standards

\* Transformation structures are illustrative in nature and subject to change based on market input and other considerations

# Post-Transformation Projections Show Long-Run Improvement over Current Rates

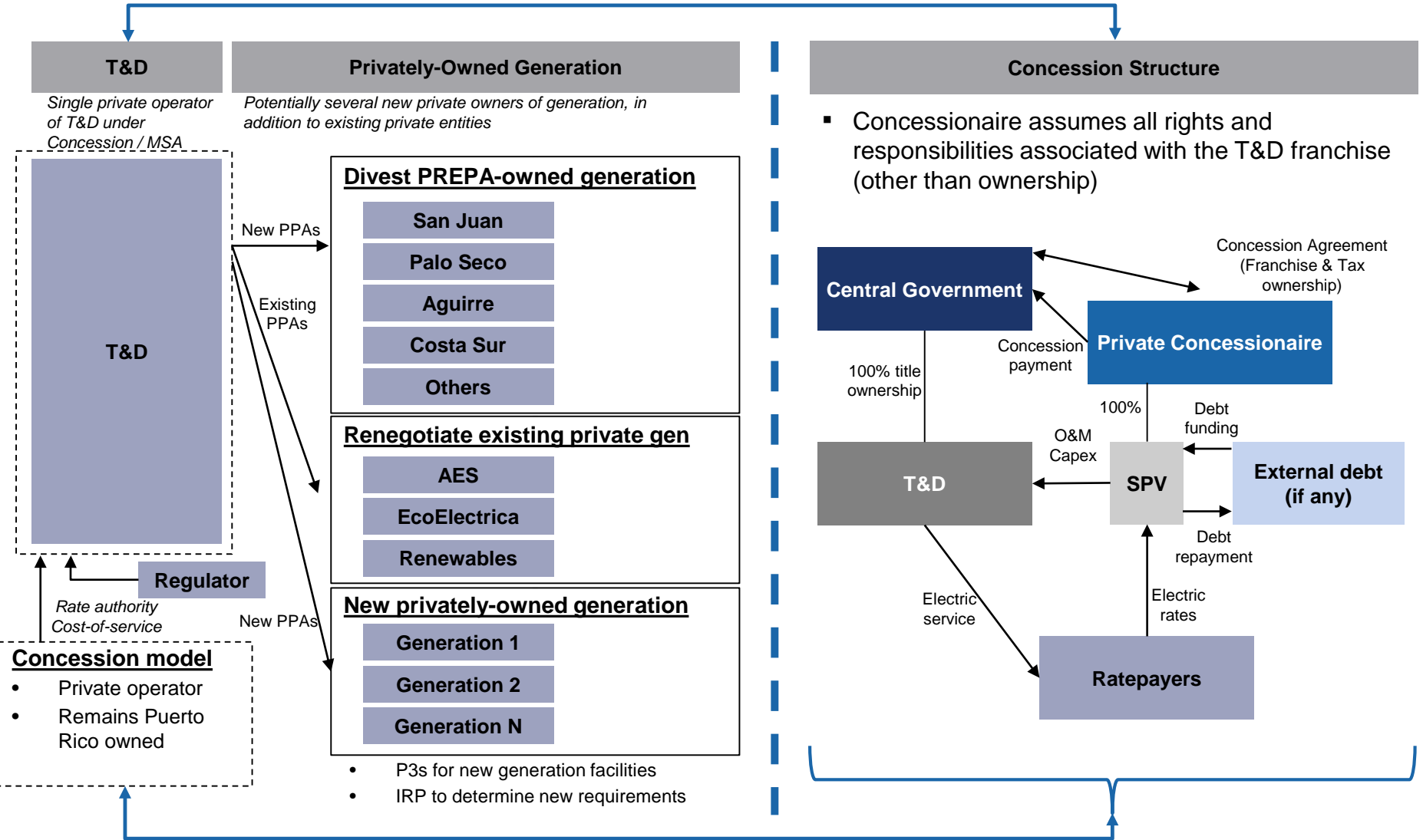
Projected cost of service rates post transformation, including operational initiatives and performance improvements



- 1) Cost of Service assumes private investment in replacements for MATS non-compliant residual oil generation with diesel or natural gas
- 2) Maintenance expense assumes federal and private funding of hardening and improvement capital investments
- 3) Debt Service Obligations must be excluded to reach 20 cents
- 4) Resolution of PREPA ERS underfunding will likely require higher contribution than indicated, actuarial study to determine full amount is in progress

Note: Rate projections herein are illustrative. Further diligence and analysis is required to fully quantify and incorporate the benefits and costs of transformation transactions in the projections.

# Transaction Structure (Illustrative Example)



- Concessionaire assumes all rights and responsibilities associated with the T&D franchise (other than ownership)

**Notes:** (1) Aggregated DG/DER could also be allowed to participate as a wholesale resource, if and as technically practicable.  
 (2) The regulator as established under Puerto Rico law.



## Illustrative Concession structures

	T&D concession	Management Services Agreement
<b>Description</b>	<ul style="list-style-type: none"> <li>Concessionaire assumes all rights and responsibilities associated with the T&amp;D franchise</li> </ul>	<ul style="list-style-type: none"> <li>A private contractor assumes responsibility for the operation and maintenance of the T&amp;D system</li> <li>Puerto Rico retains ownership of all T&amp;D / customer care utility assets and continues as ultimate service provider</li> </ul>
<b>Typical duration</b>	<ul style="list-style-type: none"> <li>25 years +</li> </ul>	<ul style="list-style-type: none"> <li>10 – 15 years</li> </ul>
<b>Sources of revenue to private entity</b>	<ul style="list-style-type: none"> <li>Concessionaire has the right to collect all revenues (and the responsibility to pay all costs) generated by T&amp;D system</li> <li>Return will depend on investment, performance, and tariff design; in a standard cost-of-service approach, the Concessionaires receive a return on and of any capital invested in the T&amp;D system</li> </ul>	<ul style="list-style-type: none"> <li>Base fee: a fixed annual payment</li> <li>Performance fee: incentive fee payable if agreed operational efficiency and reliability targets are met</li> <li>Publicly owned entity maintains right to collect all revenues (and the responsibility to pay all costs) generated by the T&amp;D system</li> </ul>

## Illustrative Concession structures (cont'd)

	T&D concession	Management Services Agreement
Rationale	<ul style="list-style-type: none"> <li>▪ A Tier 1 utility operator assumes responsibility for the T&amp;D franchise</li> <li>▪ Responsibilities would cover all aspects of the T&amp;D system – including providing any needed capital investment</li> </ul>	<ul style="list-style-type: none"> <li>▪ A Tier 1 utility operator assumes responsibility for the O&amp;M of the T&amp;D system</li> <li>▪ Structure is practicable and relatively straightforward to implement</li> </ul>
Issues / considerations	<ul style="list-style-type: none"> <li>▪ Market appetite would need to be tested and structure would need to be made attractive to an incoming private entity</li> <li>▪ Concessionaire makes return by investing capital; federal funds could limit this</li> <li>▪ Recovery of capital investment: if concession is terminated prior to recovery of investment, either the government or next Concessionaire would need to pay or assume that capital investment</li> <li>▪ Pre-approval rights for Concessionaire's capital expenditures v. after-the-fact prudent / used / useful regulatory review</li> <li>▪ Pass through of costs to provide management / operational services outside of the rate setting structure</li> </ul>	<ul style="list-style-type: none"> <li>▪ Private operator is not responsible for capital investment, so beyond the availability of federal funds, another source of capital investment would be required</li> <li>▪ Ultimately, the only downside for the private entity is not earning its incentive payment, so overall responsibility is limited</li> </ul>

## B. Criteria for Private Partners

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# Illustrative Criteria for Private Partners

Priority criteria	Objectives and rationale	Example evaluation criteria
<p>Promote economic growth</p>	<ul style="list-style-type: none"> <li>Provide achievable roadmap for operating the electric grid that <b>realizes or exceeds all targets set in Transformation</b> to promote economic growth in Puerto Rico, including minimizing the overall <b>cost of power</b>, improving <b>system reliability and resiliency</b>, offsetting <b>demand loss</b>, and complying with environmental requirements</li> <li>Propose <b>rate structure</b> consistent with goals for economic recovery in Puerto Rico and that sustains continued private investment</li> </ul>	<ul style="list-style-type: none"> <li>How fast is grid maintenance plan going to be completed?</li> <li>Confirmation of the lowest rate possible</li> </ul>
<p>Provide operational expertise</p>	<ul style="list-style-type: none"> <li>Demonstrate experience with <b>best-in-class utility operations</b>, including efficient execution of <b>operations and maintenance</b> and ability to <b>integrate new technologies</b> quickly and cost-effectively to benefit the transformed system, e.g. smart grid solutions</li> <li>Demonstrate ability to anticipate and address <b>future challenges to current and transformed operating model</b>, including increased distributed energy resources; variable energy resource integration, and changing customer demands for dynamic pricing and innovative services</li> </ul>	<ul style="list-style-type: none"> <li>What is the proposed O&amp;M cost versus PREPA's current O&amp;M structure?</li> <li>What revenues are projected?</li> </ul>
<p>Provide low-cost capital</p>	<ul style="list-style-type: none"> <li><i>Transmission and Distribution</i> - Provide expertise and access to <b>sufficient low cost private capital</b> to achieve and maintain over the entire concession term a modern and transformed energy grid infrastructure, including appropriate smart grid technologies</li> <li><i>Generation</i> – Provide up-front low cost capital to ensure necessary generation is available and enable increased renewables penetration</li> </ul>	<ul style="list-style-type: none"> <li>How much capital is/are the acquirer(s) willing to inject to develop the energy grid?</li> <li>How much of this capital will go to increasing renewables?</li> </ul>
<p>Deliver value from sale</p>	<ul style="list-style-type: none"> <li>Given the context of Puerto Rico's energy sector transformation and its importance to the Puerto Rican economy, <b>maximizing the proceeds from the sale of PREPA's generation assets</b> will only be one factor in determining the best bid(s)</li> </ul>	<ul style="list-style-type: none"> <li>Will transaction provide proceeds sufficient to repay federal loans, if required?</li> </ul>



## Local Market Concerns and Objectives (e.g., Rates; Reliability; Transparency)

In the post-Hurricane Irma and Maria era, local market concerns, challenges, and objectives have amplified

### Traditional Concerns

- Cost of energy
- Quality (voltage and frequency)
- Frequency and duration of interruptions/outages
- Environmental

### New Post Hurricane Concerns

- Overall resiliency and redundancy
- Increased recovery times
- Operational continuity
- Generation redundancy and distribution
- Transmission and Distribution capacity and resiliency

### These concerns must be addressed when transforming the Island's energy sector so as to:

- Minimize manufacturing losses and/or backlogs
- Increase Productivity
- Avoid/minimize need for backup/redundant systems
- Avoid/minimize equipment damages
- Retain/attract manufacturing, commercial, and business operations
- Maximize capital investment, economic growth and job creation
- Avoid creating new or additional stranded and inefficiently shifted costs

## C. Proposed Regulatory Framework

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## Current Legal and Regulatory Structure

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- Under Puerto Rico law, electric utility service is provided by a publicly-owned monopoly provider, PREPA
  - PREPA's obligation to serve is statutory
  - Puerto Rico law does not authorize private utilities that serve the general public
  - Private utility-scale and distributed generation exists and has been growing. Large generation typically sells to PREPA under long-term power purchase contracts; other generation is generally “behind-the-meter” and customer-specific. Private generation does not function as a utility.
- Key functions and obligations are statutorily assigned to PREPA, including maintenance of certain subsidies (e.g., RFR) and programs (e.g., Net Metering), compliance with RPS standards, and preparation of an Integrated Resource Plan (IRP)
- PREC is designed to regulate PREPA as a public entity; its regulatory authority over private electric service companies is limited and unsuited to private utilities or a concessionaire
  - Essential private regulatory functions are missing (e.g., franchise creation, CPCNs, capital and financial controls, corporate restructuring, condemnation)
  - Other core functions (ratemaking, IRP) are hardwired to PREPA's public status
  - Ill-defined jurisdiction and authority will not create or support investor confidence

## Key Features of Transformed Structure

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- New or amended legislation adapted to the transformed industry structure, but maintaining key public policies and customer protections
- Authorize private ownership of generation and for a private concessionaire to provide delivery and retail utility service using public “wires” and customer service assets
  - Generation franchises and utility concessions awarded competitively
  - Franchises and concessions include obligations and performance standards as well as providing for ongoing regulation including of performance, rates, and reliability
  - Details may be statutorily specified or left flexible for later decision by regulator or others
- Allow for access to and use of available federal funding for restoration and recovery
- Legislation to reform the regulatory process and replace PREC and its core functions with a new structure (e.g., Public Service Commission) designed to create stability and market confidence:
  - Regulate rates; recover prudent costs and market return on investment
  - Set appropriate “rate base” and returns for concessionaire
  - Use proven incentive and rate tools suited to promoting efficiency and investment
  - Set, measure, and manage objective performance standards and incentives
  - Authority over complaints, interconnections, service rules, etc., maintained
- Non-structural policies (special rates, grandfathered net metering, CILT) preserved absent express decision to change

# Key Post-Transformation Regulatory Functions

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- Retail rate regulation of monopoly retail and delivery functions of concessionaire
  - Rates recover operating expenses; maintain pass-through of generation and recovery of CILT/subsidies
  - Rates recover market required capital costs of new investment over term (mechanisms may include inclusion of startup assets in “rate base” and/or end of term recovery of unrecovered capital costs)
  - Major capital project / budget pre-approval mechanism
  - Accurate, economically rational rate design for Distributed Resources, microgrid services, and other special services; decoupling to promote recovery of cost based revenue requirement and avoid efficiency disincentive
- Generation regulation
  - Recover costs of non-rejected and new PPOAs, subject to backstop rate review authority if there is market power; costs recovered via pass through rates
  - Cost of service regulation (potentially with incentives) of owned generation
  - Regulation of wholesale energy, capacity, and ancillary services markets, as required and if and as markets develop
- Performance metrics for delivery and generation functions
  - Highlight goals for utility action
  - Objectively measure utility performance
  - Incentivize utility behavior through meaningful reward and/or penalties linked to utility investment and other actions
- Revised IRP process
  - Accommodate private generation and DER
  - IRP process adjusted to final structure aimed at ensuring reliability, RPS compliance, and least cost grid and major investment planning
- CPCN regulation of new private generation and major wires investments

# Rate and Incentive Tools

Proven regulatory tools can incentivize and promote investment, efficiency, and high performance on metrics in Puerto Rico in the context of well-understood established regulatory models.<sup>1</sup> These tools can be included in the franchise / concession structure and thereafter by the regulator. Particular tools can be chosen and refined as investor discovery proceeds and as other policy, market structure, and future investment needs solidify.

## Performance and Investment Metrics

- Direct adjustment of revenues and returns has been successfully used to incentivize performance and support development of selected assets and/or projects. Operational performance metrics can include both rewards and penalties, especially where the metric is strongly under the utility's control.
- Examples include FERC incentive rates for certain transmission projects, ROE/ROR incentives for achieving designated operational and economic KPIs (e.g., IL) and/or "output" incentives (e.g., UK).

## Multi-Year Rate and Investment Plans

- Formal mechanisms that set or cap rates or revenues over time taking into account attrition, inflation, and target innovation and efficiency gains. Less formal versions include rate steps or freezes. They aim to offer greater regulatory certainty to customers and utilities while increasing incentives to control costs, make specific investments and innovate.
- The UK, Ontario, and more than fifteen US states (e.g., GA, CO, CA, NY, IA) have used versions of multi-year rate plans with positive effects on efficiency and cost containment.

## Decoupling / Revenue Adjustments

- Mechanisms to offset or mitigate the impact on utility revenues and cost recovery of attrition caused by, e.g., economic turmoil, energy efficiency and demand response efforts, or DER penetration, especially where there are no parallel reductions in utility costs.
- Various forms of decoupling have been widely adopted across mainland jurisdictions, especially in jurisdictions with strong commitments to energy efficiency and demand management (e.g., NY, CA, MD, OH, IL) and decoupling forms a part of the UK regulatory scheme.

## Trackers and Formula Rate Mechanisms

- Mechanisms to periodically adjust rates or allowed revenues in response to changes in costs and/or sales, especially where those changes are significant and unpredictable. May be symmetric and coupled with performance incentives and prudence review. Can also be used to retroactively reconcile rates and revenues to account for unexpected changes or emergencies.
- Variations include full formula rates (e.g., FERC, IL) and targeted capital and expense trackers used in countless states and provinces and in Puerto Rico in the existing CILT, subsidy, and Fuel+PP riders.

<sup>1</sup> For a general background discussions of variants of these and other tools, see, e.g., [http://www.eei.org/whatwedo/PublicPolicyAdvocacy/StateRegulation/Documents/innovative\\_regulation\\_survey.pdf](http://www.eei.org/whatwedo/PublicPolicyAdvocacy/StateRegulation/Documents/innovative_regulation_survey.pdf).

# Performance Metrics – Function & Criteria

Reliability	Resiliency	Affordability	Safety	Service
<b>Objectively Measurable</b>	<b>Metric should:</b> <ul style="list-style-type: none"><li>▪ Have a clear definition</li><li>▪ Be capable of reliable and consistent measurement</li><li>▪ Be verifiable and not be subject to manipulation or litigation</li></ul>			
<b>Controllable by the Utility</b>	<ul style="list-style-type: none"><li>▪ Reflect the actions and performance of the utility measured</li><li>▪ Be indicative of performance and performance improvement</li><li>▪ Adjust or be normalized for exogenous factors where practical</li></ul>			
<b>Promote Policy Goals</b>	<ul style="list-style-type: none"><li>▪ Indicate achievement of one or more of the overall goals of the transformation or the public policy of the Government of Puerto Rico</li><li>▪ Be material</li><li>▪ Not be duplicative</li></ul>			

# Potential Performance Metrics

## Delivery System Reliability

- System and district interruption statistics – SAIFI, SAIDI, CAIFI, CAIDI
- Customers experiencing more interruptions than targets
- Frequency of transmission outages / contingencies affecting customers or dispatch

## Generation Reliability & Efficiency

- Unit availability (by franchise holder and unit)
- Forced outage rate (by franchise holder and unit)
- Environmental compliance

## Resiliency

- Critical infrastructure protection / hardening (plan compliance)
- Preventive maintenance backlog
- Critical customer support (monitoring, redundancy, hardening)
- Emergency recovery plan compliance

## Safety

- OSHA recordable events
- OSHA citations / violations
- Customer injury rates

## Affordability

- Delivered price (normalized; metrics vary for different utility types)
- Dispatch efficiency
- Uncollectible balances
- Days of sales outstanding, by class and private / government
- Non-technical losses / UFE
- Theft / tampering recoveries
- Rate of successful completion of payment plans

## Customer service functions

- Timely metering reading and billing rate
- Actual vs estimated reading rate (AMI and manual)
- Customers on AMI/AMR
- Call center time to answer / physical office wait times
- Time to respond to service requests (by class / district as appropriate)
- Time to respond to billing / service inquiries

## Regulatory Compliance / Performance

- Compliance with franchise conditions (completion and cost)
- Compliance with approved investment plans (completion and cost)
- Time to process interconnection requests (excluding delays attributable to customer)



## D. Federal Funding

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# Federal Funding and Impact on PREPA

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## **Stafford Act Emergency Funding**

- Emergency Work through the initial 180 days following the Incident Period for DR-4339 (Maria) is 100% Federally funded
- The cost to restore and repair the damaged infrastructure not covered by insurance proceeds is expected to be covered by FEMA Public Assistance funds (Federal cost share of 90%)
- Puerto Rico is requesting a cost-share adjustment for FEMA's programs under the Stafford Act to 100% federal. Puerto Rico seeks Community Development Block Grant-Disaster Recovery (CDBG-DR) funding to cover the cost-share match requirements of Stafford Acts programs. Historically, either FEMA or Congress have authorized a 100% federal cost-share for large and catastrophic disasters such as Hurricane Andrew in Florida and Hurricane Katrina in Louisiana and Mississippi
- Does not cover any liquidity funding except to the extent reimbursements are received for costs previously funded by PREPA
- Reimbursement of individual expenses is subject to compliance with FEMA requirements
- Timing and amount of reimbursements are unclear but emergency funding will likely not impact transformation as it will go to PREPA to address emergency needs prior to transformation

## **Community Disaster Loans**

- Loan to carry on existing local government functions of a municipal operation that have incurred a significant loss in revenue, due to a major disaster, that has or will adversely affect their ability to provide essential municipal services
- PREPA expects that a Community Disaster Loan (CDL) either directly or through the Government of PR will be necessary for PREPA to maintain the necessary liquidity to operate for the 18-month period of continued operations required by the fiscal plan
- Timing and terms of potential CDL for PREPA are unclear
  - No commitment from United States Treasury to provide a CDL
  - CDL would likely require senior position in the capital structure
  - CDL might be payable upon a sale of PREPA's assets or confirmation of a plan of adjustment unless Federal government agrees to the contrary
  - CDL can (but is not required to) be forgiven by the Federal government
  - Tenor and term still subject to input from United States Treasury

## **Permanent Funding Under the Stafford Act**

- Permanent work to mitigate the damage to the power sector will likely be through alternative procedures provided under Section 428 of Stafford Act
- Timing and amount of funding is unclear
  - Initial damage assessment likely to take twelve months
  - Negotiation of fixed payment to Government of PR to address damage to power sector
- May be used to fund rebuild of current system or for an alternative use depending on agreement
- Timing, amount and terms will determine how the Federal funding will be integrated into plans for PREPA and the energy sector transformation generally

# E. Grid Resiliency

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# The Puerto Rico Energy Resiliency Working Group (ERWG), led by NYPA, Prepared a Grid Resiliency Rebuild Assessment

- Immediately following Hurricane Maria, PREPA set out to review and assess damage to the system and began emergency restoration
- Damage assessment and emergency restoration efforts were supported by NYPA, ConEd, and USACE. Further damage assessment and resiliency rebuild estimates were developed by The Puerto Rico Energy Resiliency Working Group, comprised of the following members:
  - New York Power Authority, Puerto Rico Electric Power Authority, Puerto Rico Energy Commission, Consolidated Edison NY, Edison International, Electric Power Research Institute, Long Island Power Authority, Smart Electric Power Alliance, U.S. Department of Energy, Brookhaven National Laboratory, and the Public Service Enterprise Group
- The Puerto Rico Resiliency Working Group estimate for the cost to rebuild with minimum resiliency to withstand extreme Category 4 storms and sufficient design margin to ensure high survivability for Category 5 events are summarized below
- Absent substantial federal funding for the rebuilding effort, the Energy Resiliency Working Group recommendations cannot be implemented

- The ERWG Grid Resiliency Report was part of the Government's formal request for supplemental Federal assistance
- Although Puerto Rico anticipates significantly more Federal Disaster Relief Assistance, out of the \$17.6BB for Federal Disaster Relief for the Rebuild of the Electric Grid, the Puerto Rico Government currently estimates that \$13.7BB of federal assistance would be available for repairs and improvements of the electric system.

Rebuild Recommendations	Total (millions)
Overhead Distribution (includes 38kV)	\$5,268
Underground Distribution	\$35
Transmission - Overhead	\$4,299
Transmission - Underground	\$601
Substations - 38kV	\$856
Substations - 115kv & 230kV	\$812
System Operations	\$482
Distributed Energy Resources	\$1,455
Generation	\$3,115
Fuel Infrastructure	\$683
<b>Total Estimated Cost</b>	<b>\$17,606</b>

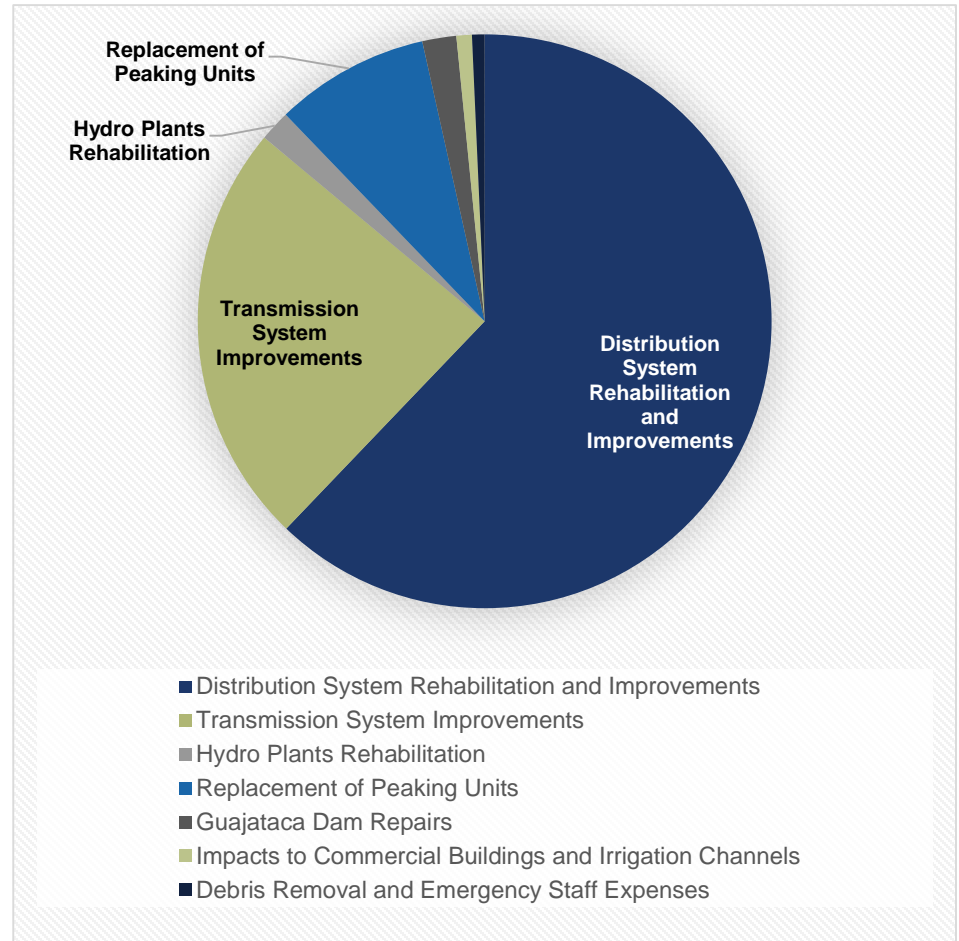
Source: Puerto Rico Energy Resiliency Working Group report, November 2017

Note: Each line item includes a 30% scope confidence escalator. Final cost estimates require multiple engineering studies and an updated IRP.

# Although Puerto Rico anticipates significantly more Federal Disaster Relief Assistance, it included \$13.7BB in assistance for Electric Power Infrastructure

- The preliminary estimate of \$13.7BB included in the Central Government Fiscal Plan is based on the following breakdown, which PREPA is in the process of evaluating and comparing to other third party estimates

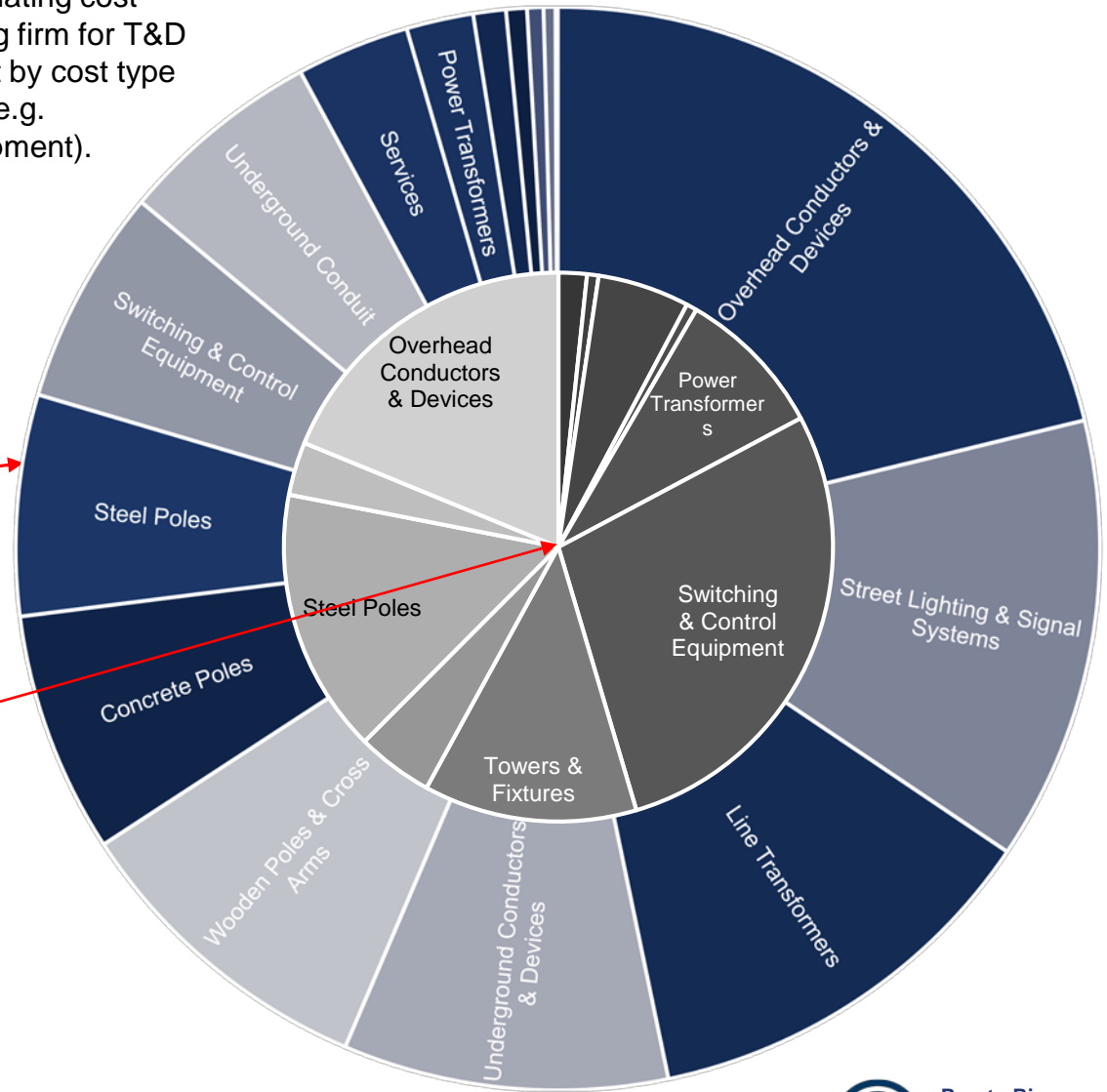
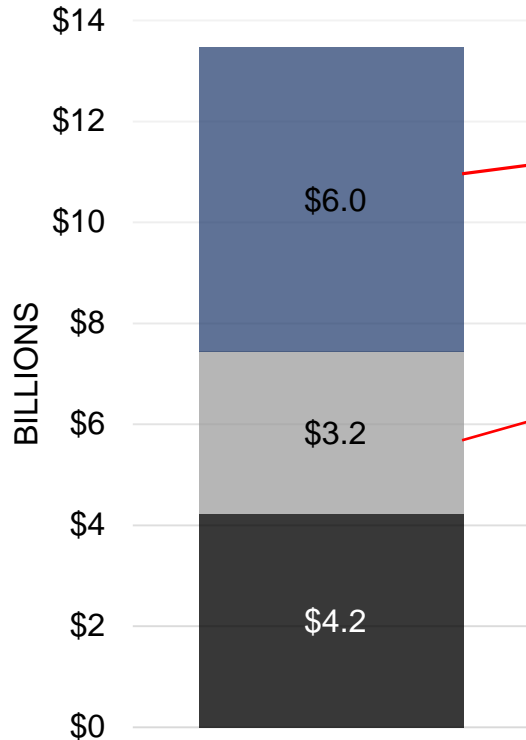
Category	Amount
Distribution System Rehabilitation and Improvements	\$8,374
Transmission System Improvements	\$3,222
Hydro Plants Rehabilitation	\$235
Replacement of Peaking Units	\$1,173
Guajataca Dam Repairs	\$258
Impacts to Commercial Buildings and Irrigation Channels	\$117
Debris Removal and Emergency Staff Expenses	\$95



# Preliminary Restoration Rebuild Estimate

PREPA is in the process of analyzing and validating cost estimates prepared by a third party engineering firm for T&D system repair and overall system improvement by cost type (e.g. labor, materials) and spending category (e.g. transmission poles, distribution switching equipment).

- Distribution System Repair
- Transmission System Repair
- Overall System Improvements



Cost estimates are in preliminary form and subject to change. More detail to be provided

# Grid Resiliency – Potential Grid Improvements

The ERWG made recommendations for improvements and replacements that cannot be achieved by PREPA absent substantial federal funding.

## Hardening & Resiliency Executive Summary

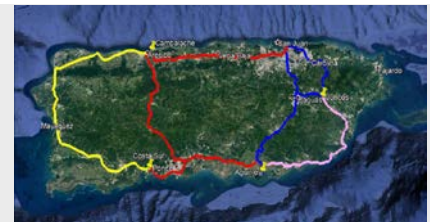
- ▶ **Generation:** Relocate smaller coastal or river-located facilities, use of load frequency control, build back renewable energy sources, and integrate DER
- ▶ **Transmission:** New monopole towers, high strength insulators
- ▶ **Substations:** Defense-in-depth (multilayered) flood protection
- ▶ **Distribution:** Use of concrete and galvanized steel poles, new backup control center
- ▶ **System Ops:** Use of microprocessor-based devices and proven control system technologies

## Generation Related Improvements

- ▶ **Aguirre Plant :** Test and inspection; base repairs; spares replacement; storm hardening; install H-class machine at Aguirre to address MATS compliance, system stability, and fuel diversification issues
- ▶ **Palo Seco Plant:** Installation of dual fired F-class machine to address MATS compliance, system stability, and fuel diversification issues; storm hardening
- ▶ **Other Plants:** Test and inspection; base repairs; spares replacement; storm hardening

## Transmission Related Improvements

- ▶ Relocate 230 KV Transmission lines to existing highways (see image)
- ▶ Replace poles for higher wind rating; move high risk lines underground
- ▶ Straighten and grout existing poles or replace with deeper subgrade and/or engineered foundations
- ▶ Improve insulators, particularly in salt contamination areas

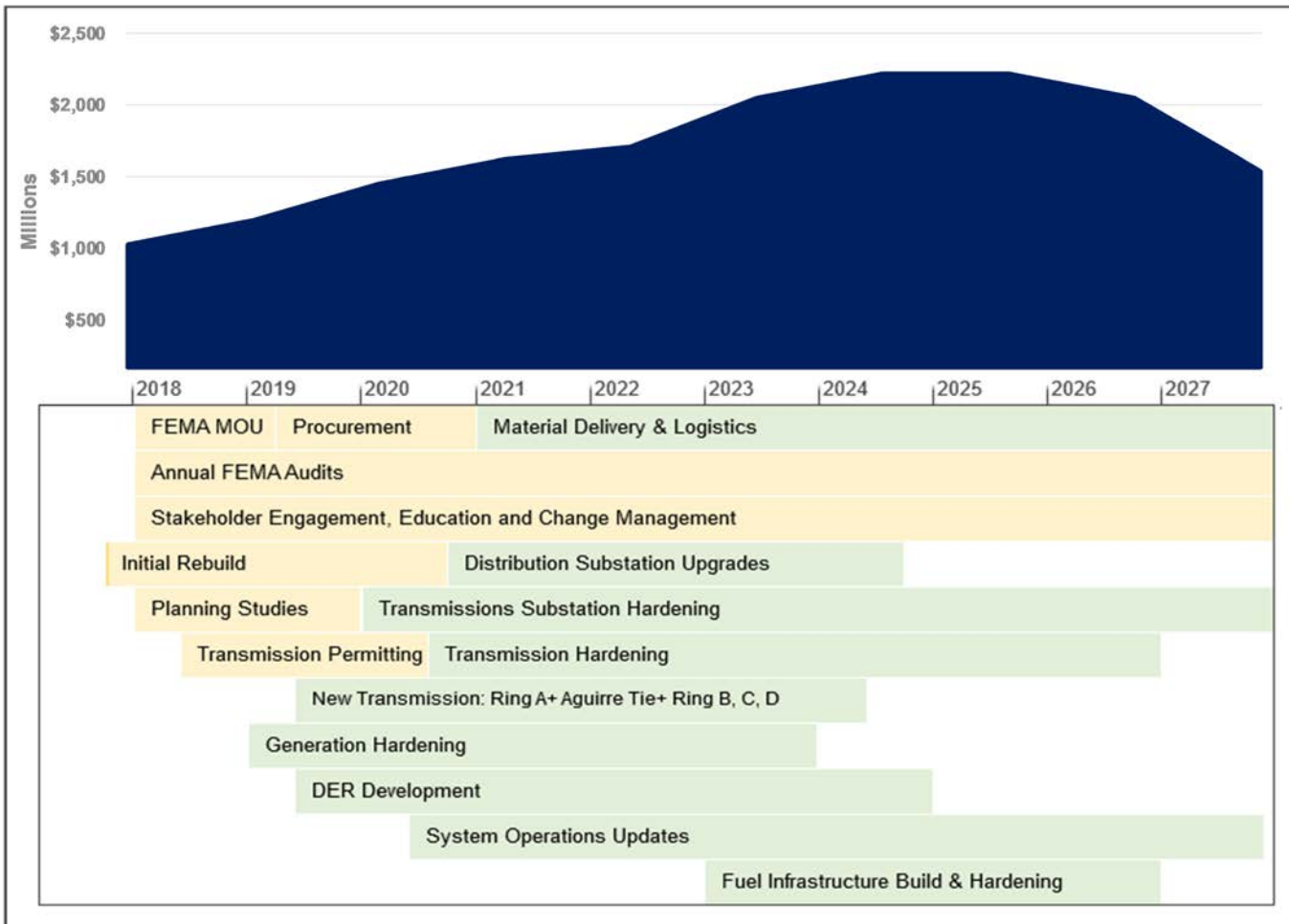


## Distribution Related Improvements

- ▶ Replace poles for higher wind loading, install breakaway service connections, install fully insulated wire, relocate distribution away from transmission, selectively underground distribution
- ▶ Replace poles with deeper subgrade support, selectively underground in areas with water-driven debris
- ▶ Relocate lines to accessible street level, selectively replace overhead with underground
- ▶ Add automated switches with FDIR capability
- ▶ Improve insulators, particularly in salt contamination areas

# Timeline of Recommended System Improvements by the ERWG is Conditioned Upon Receipt of Necessary Federal Funding

The ERWG laid out a timeline for implementation and funding of recommended system improvements over time. The timeline ignores any constraints on funding, and provides guidance on estimated sequencing and duration of activities.



Activities underway or expected to begin in early Q1 2018:

- Rebuild and repair of salvageable substation equipment, fences, communications equipment, and restoration of physical security.
- FEMA audit (A-133 or single audits) preparation required for any entity that expends \$750,000 or more of federal assistance. Filings for 2017 expenditures must be completed by September 30
- Transmission studies, engineering assessments, DER site studies, and other planning studies