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Policy Brief

The Short Memory of the Masters of Disaster

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INTRODUCTION

Historians, whenever possible, try to work using primary sources — diplomatic cables, a ship captain's log, a soldier's diary, ancient pictographs from a scroll— for a reason. Human memory is short and fallible, while written records can faithfully preserve first-hand accounts of human folly, in theory, forever. Of course, interpretations of those sources can and should be challenged, but once a source's authenticity has been established its evidentiary value is beyond reproof.

Recently, we have been hearing some unreasonably rosy statements about how well the Puerto Rico Electric Power Authority ("PREPA") used to work. What caught my attention was that these utterances were not made by the usual suspects, by which I mean people who speak in hushed and reverent tones about "Governor Tugwell" and "Mr. Luchetti", the "glory that was PREPA" and how it was the "crown jewel". To them I say, well, *sic transit* and good luck with that — all those things happened a long time ago. Those of us who have lived through PREPA's implosion should know better.

That is why I looked up the Official Statements for PREPA's last two bond offerings, dated April 12, 2012 (the "2012 OS") and August 15, 2013 (the "2013 OS"), respectively. These documents contain a wealth of data and information about Puerto Rico's electricity system. And they tend to be accurate, as they are prepared in accordance with federal securities laws.

SPEAK, MEMORY

So what did we find? First off, we found that as of August 2013, PREPA had been reporting operating losses for several years in a row. According to the 2013 OS: "For each of the last four fiscal years the Authority incurred losses before contributed capital in accordance with GAAP. These losses reflect **the continuation of a historical trend of net losses** that have resulted in a deficit in the Authority's consolidated net assets of $515.7 million as of June 30, 2012. This means that, as of June 30, 2012, the Authority's total liabilities of $10.8 billion exceed its total assets of $10.3 billion." (2013 OS, p. 21). **In other words, PREPA was already insolvent, on a balance sheet basis, as of the end of fiscal year 2012.**

Furthermore, during fiscal years 2011, 2012, and 2013 PREPA's liquidity deteriorated significantly and "due to liquidity constraints the Authority had a need to use lines of credit and Power Revenue Bonds **to finance its operational expenses**." (2013 OS, p. 22). This practice raises a red flag for two reasons. First, using long-term debt to finance operating expenses is always first and foremost a clear sign of financial distress. And, second, by diverting debt proceeds to pay for operational expenses, this practice limited the amount of funds available for financing the capital expenditures necessary for system maintenance. This affected the maintenance for the entire system, including the generation component, as "**about half of the $787.5 million in capital expenditures for the five fiscal years ended June 30, 2013 for production plant was spent for such scheduled maintenance.**" (2013 OS, p.38).

By 2013 it was well known that PREPA relied too much on debt to finance its capital improvement program. Indeed, both the 2012 OS and the 2013 OS state that such reliance "has caused the Authority's level of indebtedness and related debt service requirements to increase significantly" and "the Authority's Consulting Engineers have recommended that the Authority increase the amount of its capital improvement program funded from internally-generated sources." (2012 OS, p. 17 and 2013 OS, p. 21). Alas, PREPA never did comply with that recommendation.

It should not be surprising then that this combination of (1) low liquidity; (2) funding current spending with long-term debt; and (3) limited access to the capital markets due to increased levels of indebtedness and debt service, resulted in a significant reduction in system maintenance expenditures. And that is exactly what the Official Statements demonstrate, a reduction in maintenance spending, from **$250.6 million** during fiscal year 2007 to **$213.9 million** during fiscal year 2013, **a decrease of $36.7 million, or 14.6%.** (2012 OS, p. 71 and 2013 OS, p. 58)

The lack of maintenance, in turn, affected overall system performance. Between 2007 and 2011, the annualized electric generation equivalent availability decreased significantly, **from 84% in 2007 to 78.9%** in 2011; while the equivalent forced outage rate (an indication of the average percentage of total dependable generating capacity which is unavailable throughout the year due to forced outages or partial generating capacity outages) increased considerably, **from 10% to 15.8%,** during the same period. (2012 OS, p. 51). Meanwhile, the **Dependable Reserve Margin**, which is the reserve capacity available as a percentage of peak load, was forecast **to decrease from 77% in 2014 to 67%** in 2018. (2013 OS, p. 40).

A Series of Unfortunate Events?

So, while PREPA officially claimed that it suffered from a series of unfortunate events caused by a veritable menagerie of small animals, both feral and domestic — wandering cats, leaping lizards, hopping iguanas, and critters of a hitherto unknown genus and species that ostensibly "lived" inside electricity meters — most of which presumably faced a ghastly demise by coming into contact with the wrong end of a 13 kV line, the truth is that by the time PREPA filed for bankruptcy in May 2017 the system was already thoroughly fragile, with decreasing available capacity; increasing outage rates; and limited available reserves. The masters of disaster have a short memory, indeed.

And then Hurricane María hit, devastating the transmission and distribution system in September 2017. According to data from the Federal Emergency Management Agency ("FEMA"), within hours of Hurricane María's landfall in Puerto Rico, 100 percent of PREPA's clients were without electric power service and 80 percent of its infrastructure was destroyed. After a slow start, tainted by some unbecoming shenanigans involving two fly-by-night corporations based in the mainland, it took several billion dollars and the better part of a year to restore electric service throughout the island.

However, as important and massive as that job was, it was always understood that it was not a permanent fix — a thorough refurbishing of the grid was necessary to bring it up to 21st century standards. PREPA estimated such refurbishing would cost north of $10 billion. Years of negotiations

with FEMA followed, until an agreement was reached in December 2020. In the meantime, the patched-up grid kept acting up.

On the generation side not much happened either, as evidenced by the continued dispatch of the Palo Seco generation plant, a fantastically aged contraption, described by a former Assistant Secretary of the U.S. Department of Energy in a 2019 Congressional hearing as a "defunct facility." To be fair, two generation units of the San Juan plant were recently "upgraded" to burn natural gas, but through a suspicious transaction that is currently under scrutiny by the Federal Energy Regulatory Commission.

THE PLOT THICKENS

Such was the neglected state of Puerto Rico's electricity system — an old, unreliable, fossil fuel-based generation fleet connected to a functional but fragile and unstable transmission and distribution grid — when PREPA and the government of Puerto Rico executed a long-term agreement for the operation and maintenance of the electric grid (the "O&M Agreement") with LUMA, a Canadian/Texan consortium.

Under the O&M Agreement, PREPA is in charge of the generation (along with a couple of private generators) and LUMA is in charge of the transmission grid. In practice, though, things are seldom so clear cut; because if electricity is to be delivered to the final customers, then PREPA and LUMA have to interconnect and closely coordinate the amount of energy loaded into the system at any given time.

In general, the demand and supply of electricity have to be balanced at all times. If the transmission lines are congested because the load exceeds the demand then the grid will not accept additional load and some generation will shut down. Conversely, if demand exceeds the capacity of the grid to deliver electricity at any given time, then parts of the transmission and distribution system will go offline. So, keeping the lights on requires a kind of hand-in-glove coordination between PREPA and LUMA, as PREPA runs the generation fleet but LUMA determines which generation resources interconnect with the grid, at what time, and in which order.

That coordination is ostensibly executed in accordance with the terms and conditions of another agreement among and between PREPA, LUMA, and the Puerto Rico P3 Authority: the GridCo – GenCo Power Purchase & Operating Agreement (the "PPOA"). To the best of our knowledge, the PPOA has not been made public, but Exhibit H to the O&M Agreement sets forth a term sheet for the PPOA. According to the term sheet, these are some of the key terms and conditions of the PPOA:

- Pursuant to the PPOA, **GenCo agrees to sell and GridCo agrees to accept delivery of and purchase the Energy** and/or Dependable Capacity of the Generating Facilities, which shall not be reduced except as provided by the PPOA.
- Each Generating Facility will be assigned a "Dependable Capacity" which is the net electric generating capacity (gross electric generating capacity less station use) in kW, as determined by testing to be performed from time to time pursuant to the PPOA, which shall also determine the optimal output to meet system load requirements at the lowest possible cost to

reliably service customers **while recognizing the operational limits of the generation facilities…**

- For any contract year…GenCo shall prepare and deliver to the T&D Operator (with copy to GridCo)…**its proposed operations and maintenance budget** (the "Operating Budget") and proposed capital budget (the "Capital Budget", together with the Operating Budget, the "Budgets") for such year, together with financial forecasting for the following two (2) contract years.
- The Operating Budget for any contract year shall include a month-by-month estimate of (i) the working capital reasonably determined by GenCo to be needed for the day-to-day operation of GenCo, (ii) **fixed and variable operations and maintenance costs,** and (iii) costs and expenses associated with fuel purchases (including a two percent (2%) in excess of the total amount for excess expenditures that may arise in any contract year), in each case for the following contract year.
- **GridCo shall pay GenCo a monthly amount based on the approved budgets, including any costs and expenses for approved capital improvements relating to the Generating Facilities and related supplemental working capital and all costs and expenses associated with the operation and maintenance of a ramped down unit and/or Generating Facility** (the "Monthly Generation O&M Charge").
- The T&D Operator, as agent of GridCo and dispatch manager, **shall at its sole discretion have the right to dispatch the units at the Generating Facilities** within their operational limits and in accordance with the principles related to the dispatch of power and electricity set forth in Schedule 1 to Annex I (Scope of Services) of the T&D O&M Agreement.

So there you have it. PREPA is required to provide "dependable generation capacity" in exchange for a monthly payment from LUMA to cover operating and maintenance expenses, as well as approved capital expenditures; while LUMA has absolute control to dispatch generation and manage system load at any given time.

Notice the complex nature of the current arrangement: PREPA is responsible for the operation and maintenance of the generation fleet, while LUMA is in charge of funding PREPA's operations on a monthly basis and dispatching load into the grid. Given the complicated character of this relationship, we suspect that the recent rolling blackouts are as much a function of (1) a decrepit generation fleet and an unstable transmission and distribution grid as of (2) a series of coordination failures between PREPA and LUMA.

Given this state of affairs, this is what we can expect and what we hope can be done:

- **It will take about 10 years to upgrade the transmission and distribution system**, with or without LUMA. This task is exceedingly complex and expensive. And there are no shortcuts.
- **The modernization of the generation fleet will also take several years**, be it with additional natural gas capacity, increased generation from renewable sources, or a combination of both.
- The above means that in the short term electric service in Puerto Rico **will continue to be unreliable and expensive.**
- **Rising fossil fuel prices** (including natural gas), **the unavailability of several low-cost generation units** to meet base load due to unforeseen breakdowns, and **the obligation to**

eventually start paying debt service on PREPA's restructured indebtedness, will be the main drivers of the cost of electricity in Puerto Rico.

- Nonetheless, **some remedial measures could be implemented in the short term** to stabilize the transmission and distribution system and to reduce the dependence on the use of high-cost peaking units. It is up to both PREPA and LUMA to identify those "quick wins" and execute them.
- In addition, **the transition to renewable generation must continue**. The generation of electricity using renewable sources protects both the environment, by lowering emissions of greenhouse gases, and consumers, by stabilizing the price of electricity. **It is not true that electricity from renewable sources is always more expensive than electricity generated with traditional fuels.** The technology for solar and/or wind generation in combination with battery storage has developed significantly during the last few years, in some cases approaching the costs of natural gas generation.
- Furthermore, in order to properly compare costs between one kind of generation and another, it is necessary **to add the cost of the environmental and health damages** caused by fossil fuel generation. Adding in the costs of these negative externalities almost always reveals that fossil generation is costlier than initially thought. The imposition of a carbon tax is one of several policy alternatives to force polluters to internalize the cost of these negative externalities they impose on society at large.
- Finally, it is imperative that the government agencies in charge of implementing energy policy in Puerto Rico have the necessary resources to execute their respective missions: (1) the PREB to regulate rates and promote long-term planning for the system; (2) the P3 Authority to effectively monitor and robustly enforce the O&M Agreement with LUMA; and (3) PREPA to adequately coordinate the day-to-day operation of the generation system.

Conclusion

While we understand and sympathize with the feelings of frustration expressed by many Puerto Ricans in connection with recent rolling blackouts, it would be a mistake to romanticize the old PREPA. As we have demonstrated above, things were not all copacetic when PREPA was in charge, Puerto Rico's energy woes were years in the making and are the direct result of PREPA's mismanagement, negligence, and corruption. Handing control back to the masters of disaster is not an option.

However, PREPA's indictment is not LUMA's vindication. LUMA had about a year to prepare for the takeover of Puerto Rico's electricity grid and its performance so far has been, in the best case, deficient, and in the worst, dismal. Its management, so far, has utterly failed to deliver on its promises.

Finally, it is important to keep in mind that both PREPA and LUMA bear some responsibility for the recent malfunctioning of Puerto Rico's electricity system. The process negotiated under the aegis of the Puerto Rico P3 Authority requires good faith efforts from both companies to run the system successfully. We suspect, though, that PREPA is desperately clinging to its old ways of doing things, while LUMA has probably not internalized the fact that it needs to modify its standard playbook to account for an old, unstable, and unreliable electric system. It is in the best interests of both companies to change their ways, for their own benefit and the wellbeing of the Puerto Rican people.

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