

Opportunity for a New Direction for Puerto Rico's Electric System



**Institute for Energy Economics
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IEEFA.org

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Introduction

El Puente's Latino Climate Action Network (Enlace Latino de Acción Climática) asked the Rockefeller Family Fund (RFF) for help in analyzing the Puerto Rican electric system, run by the Puerto Rico Electric Power Agency (PREPA), and to recommend tangible and practical reforms to the system. RFF, in turn, recruited the Institute for Energy Economics and Financial Analysis (IEEFA) to perform that analysis and make those recommendations. The report prepared by IEEFA recommends increasing the use of electricity generated by solar and wind, increasing energy efficiency measures, bringing down the cost of electricity for consumers, and addressing the problem posed by PREPA's debt crisis.

Executive Summary

Puerto Rico's electricity system is in need of transformation. The Puerto Rico Electric Power Authority (PREPA), the public agency that runs the island's electrical system, is more than \$8 billion in debt and struggling to pay its creditors. PREPA's financial problems are due to a combination of factors that include rates that do not cover the cost of generating power, an inefficient system of subsidized electricity, and a high level of electricity theft.

In addition to its financial problems, PREPA is hobbled by an old, expensive and heavily polluting power system. More than half of the island's electricity—the vast majority of which is generated by PREPA—comes from oil-fired power plants. It is likely that as a result of the U.S. Environmental Protection Agency's Mercury and Air Toxics Standard (MATS), PREPA will retire or curtail the operation of most of its oil-fired units. Therefore, PREPA is planning major investments in its generation system over the next decade. PREPA's "preferred path" calls for the utility to replace its over-dependence on oil with over-dependence on natural gas.

PREPA is thus facing a two-fold, intertwined challenge: energy and financial. PREPA will not be able to make the necessary investments in its generation system unless it is able to resolve its debt crisis.

In Part 1 of the report, we highlight the peril of transitioning Puerto Rico's electrical system from one based largely on one fossil fuel—oil—to one based on another—natural gas. One result would be that Puerto Rico would divert more than \$1 billion per year from its fragile economy just to pay for fuel, even though the island is blessed with abundant wind and solar energy. We note that PREPA's record on energy efficiency has been terrible, ranking last among states and U.S. territories. We note also that Puerto Rico has largely failed to prioritize development of its wind and solar resources. Puerto Rico does not rank among the top 10 states in terms of installed solar capacity per capita. And PREPA has not seriously evaluated an energy system transformation that would turn heavily on wind, solar and energy efficiency, even though all three resources are highly cost-competitive in Puerto Rico. Puerto Rico ranks 33rd among U.S. states and territories for wind energy.

We make three energy-reform recommendations:

- That Puerto Rico pursue a clean-energy transformation from its current over-reliance on expensive and outdated oil-fired power plants.
- PREPA should not lock into an investment path that would make the island overly reliant on natural gas.
- That PREPA adopt an integrated resource plan that includes a scenario prioritizing investment in wind, solar and energy efficiency.

Part 2 of the report relates to PREPA and the broader Puerto Rican debt crisis. On Sept. 2, PREPA released a tentative debt-relief plan that it negotiated with a portion of its bondholders. PREPA has disclosed that the plan would provide for an 85% exchange rate on a portion of PREPA's indebtedness, that is, bondholders would receive 85% of principal.

A complete analysis of the debt deal is not yet possible because not all of the terms have been disclosed. Transparency is in the public interest, and public disclosure of the status of these negotiations should be required alongside additional approvals needed to complete this transaction.

Based on the information that has been made public, IEEFA makes the following recommendations for next steps in the debt-restructuring process:

- 1) That PREPA make additional efforts in the coming weeks to secure deeper principal reductions from bondholders, particularly large institutional investors, hedge funds, and insurance companies in order to provide itself greater financial flexibility.
- 2) That PREPA acknowledge the proposed 85% level of bond recovery is too generous to bondholders and will undermine PREPA's efforts at long-term financial reform and frustrate investment in new energy resources.
- 3) That whatever debt improvements PREPA ultimately makes be used to make room for prudent investments in solar energy, wind energy, and energy efficiency and not for an increase in the agency's reliance on natural gas.
- 4) That the final deal include plans to reduce PREPA's high electric rates so as to protect ratepayers and avoid undermining Puerto Rico's future.

A new debt agreement for PREPA could provide the agency with crucial financial flexibility and a timely platform to launch a new energy plan for Puerto Rico.

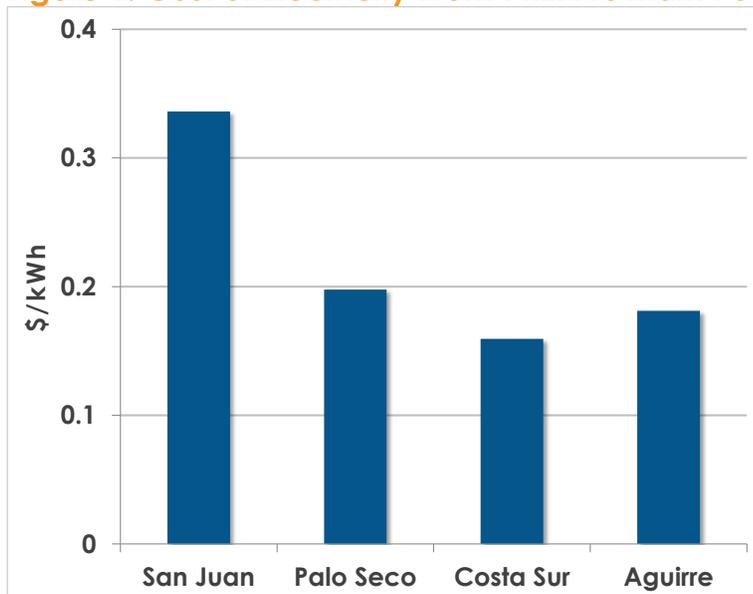
Part 1: Electricity

Background on Puerto Rico's Electric Power System

The Puerto Rico Electric Power Authority is a vertically integrated utility that owns power plants, transmission lines and the distribution system in Puerto Rico. Most of the generation on the island is owned by PREPA, but PREPA also contracts with third-party power suppliers.

PREPA's largest power plants are the Aguirre (1,420 MW), San Juan (800 MW), Palo Seco (602 MW) and Costa Sur (990 MW) plants.¹ All four are oil-fired with the exception of two units at Costa Sur that co-fire natural gas and oil. In total, PREPA owns about 4,700 MW of generation and contracts for an additional 1,200 MW. The electricity produced by PREPA's largest plants is very expensive. Figure 1 shows the marginal cost of generating electricity from these plants—this includes the cost of fuel and the annual operation and maintenance costs for the fiscal year ending June 30, 2014. Costs range from 16 to 34 cents per kWh.² By way of comparison, wholesale costs of power in the mainland U.S. are in the range of 3 to 7 cents per kWh. Puerto Rico's electricity is among the most expensive in the country. Retail electricity prices on the island are 26 cents per kWh.³

Figure 1: Cost of Electricity From PREPA's Main Power Plants in Fiscal Year 2014



¹ PREPA, "Integrated Resource Plan Volume 1", August 17, 2015. Table 3-1

² PREPA, "Other Information Required in the Regulation on Integrated Resource Plan for the Puerto Rico Electric Power Authority," July 2015.

³ Lisa Donahue, "PREPA's Transformation: A path to sustainability," June 1, 2015. And U.S. Energy Information Administration, "State Electricity Profiles," July 8, 2015: <http://www.eia.gov/electricity/state/>

In addition to owning power plants, PREPA buys power from independently-owned power plants. PREPA's contracted generation consists of power from the AES coal plant (454 MW), the EcoElectrica natural gas plant (507 MW) and from 242 MW of renewable energy, including distributed solar.

Figures 2 and 3 show Puerto Rico's electricity mix. Figure 2 shows the total electric generation capacity (MW), and Figure 3 shows the actual electricity generated (MWh) in 2014; the figures are not identical because the plants are not all operating for the same amount of time each year. About half of Puerto Rico's electricity, and more than half of its capacity, comes from oil-fired power plants. Less than 3% of its electricity comes from wind and solar.

Figure 2: Puerto Rico's Power Plants (MW)

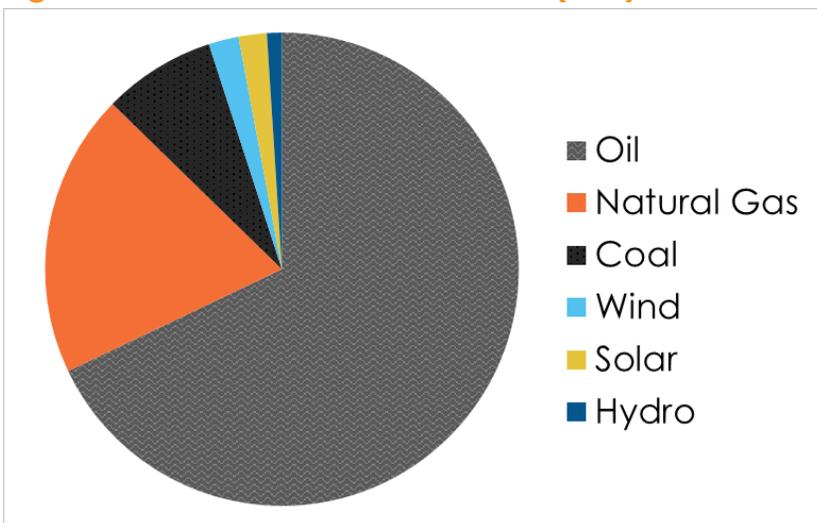
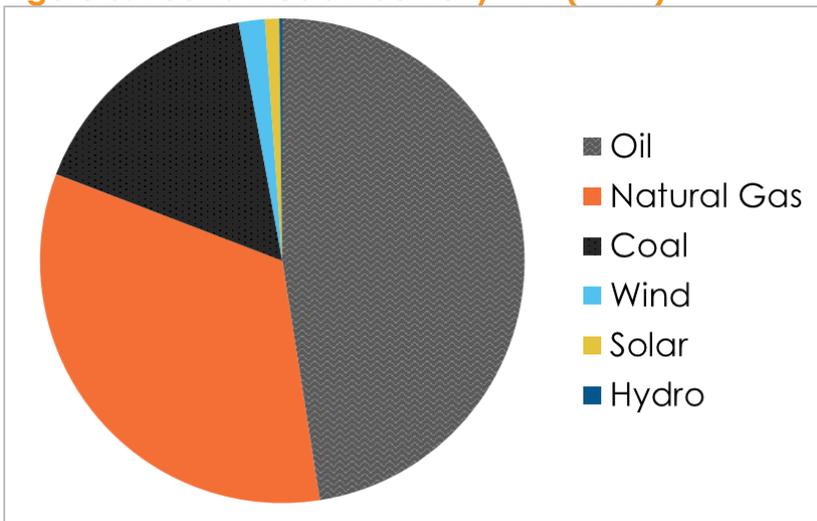


Figure 3: Puerto Rico's Electricity Mix (MWh)

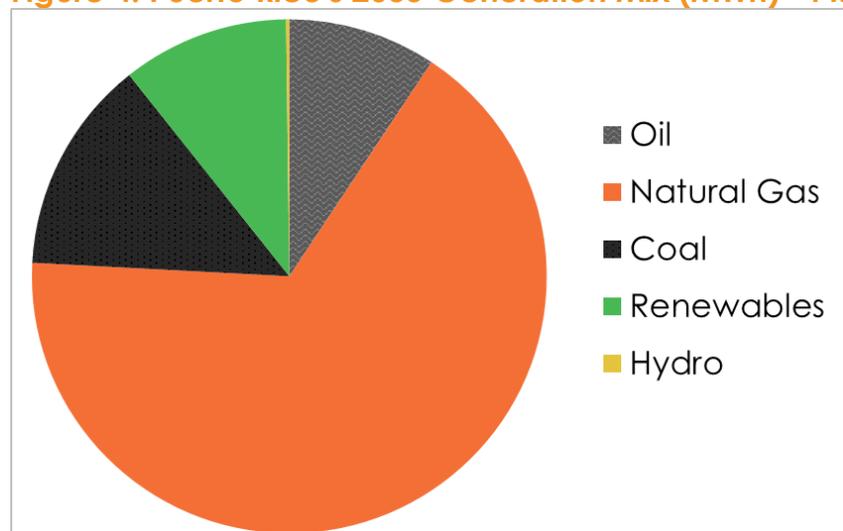


Existing Proposals for Transitioning Puerto Rico's Electric Power System

In July 2015, PREPA released an Integrated Resource Plan laying out how it proposes transitioning the electricity system of Puerto Rico over the next two decades. The plan was the first integrated resource plan ever produced by PREPA, and came about as a requirement of an energy reform law passed in 2014. PREPA released a slightly revised version of the integrated resource plan in August 2015.

The plan, which is subject still to review and approval by the Puerto Rico Energy Commission, analyzes the costs and benefits of three portfolios, all of which would move the island's electricity-generation mix to a heavy dependence on natural gas. Under all three scenarios, most of Puerto Rico's existing oil-fired steam units would be retired or would be run very infrequently in order to comply with environmental regulations. In PREPA's "recommended portfolio," the Aguirre oil-fired combined cycle plants would be repowered to run on natural gas, and several new natural gas combined cycle units would be constructed. As shown in Figure 4, about two-thirds of the island's electricity would come from natural gas by 2035 under this scenario.⁴

Figure 4: Puerto Rico's 2035 Generation Mix (MWh) - PREPA Preferred Scenario



⁴ Puerto Rico's renewable portfolio standard law requires PREPA to achieve 20% renewable energy by 2035. PREPA's integrated resource plan targets only 15% by 2035. According to the integrated resource plan, "In evaluating the tradeoffs, priorities and objectives of PREPA under the constraints of very challenging financial conditions, Siemens and PREPA has set reduced and delayed milestones RPS goals as follows: 10 percent renewable generation of energy sales by 2020, 12 percent by 2025, and 15 percent by 2035." (PREPA, "Integrated Resource Plan Volume 1", August 17, 2015 page 6-3)

An alternative transformation plan was proposed in September 2014 as part of PREPA's debt-restructuring negotiations. That plan was posed by Lisa Donahue, a managing director at the consulting firm AlixPartners who was contracted to be chief restructuring officer at PREPA in September 2014. In June 2015, Donahue released a public document entitled "PREPA's Transformation: A Path to Sustainability," which outlines a proposal for making PREPA financially sustainable. Under the Donahue plan, the power plants owned by PREPA would be 94% gas-fired by 2030 (today the plants owned by PREPA are nearly 75% percent oil-fired). PREPA's share of generation from renewable energy would increase from approximately 3% to 12%.

Under either the Donahue plan or PREPA's preferred scenario, according to its integrated resource plan, PREPA will become even more dependent on natural gas than it currently is on oil.

Risks of Over-Reliance on Natural Gas

PREPA's planned dependence on natural gas carries several risks:

1. The risk of increased delays and expense in constructing natural gas infrastructure

Currently, Puerto Rico's only supply of natural gas is through a liquefied natural gas (LNG) import terminal owned by EcoElectrica and used to supply natural gas to EcoElectrica's power plant, which sells power wholesale to PREPA. The EcoElectrica terminal also supplies natural gas to the Costa Sur plant, which currently has two dual-fueled units. A proposed additional LNG import terminal, the Aguirre Offshore Gas Port (AOGP), received permitting approval from the U.S. Federal Energy Regulatory Commission in July 2015. The AOGP project is scheduled to be completed in 2017. According to PREPA's integrated resource plan, "these natural gas terminals [EcoElectrica and Aguirre] as permitted have no further capacity available for fueling electric generation beyond the current units at Costa Sur and Aguirre."⁵ In other words, Puerto Rico has no natural gas supply to sites on the north shore of Puerto Rico, including San Juan and Palo Seco.

Although PREPA's preferred scenario in its integrated resource plan does not rely on new natural gas supply to the north, PREPA's five-year capital plan and its Corporate Strategic Plan for 2014-2018 both call for conversion of oil-fired units in the north to natural gas.⁶

The options for providing natural gas to the north include constructing another LNG import terminal at San Juan, constructing a south-to-north gas pipeline, or shipping LNG in 40-foot cargo containers to the north shore (likely the most expensive option).

⁵ PREPA, "Integrated Resource Plan Volume 1", August 17, 2015, page 5-1.

⁶ PREPA, "Program de Mejoras Capitales, Años Fiscales 2014 al 2018", June 25, 2013. And PREPA, "Plan Estratégico Corporativo 2014-2018", February 18, 2014.

PREPA runs the risk of cost overruns and construction delays in constructing the Aguirre Offshore Gas Port, which would result, in turn, in delays and higher costs in converting its power plants to natural gas, costs that ultimately would be paid by PREPA customers. Additionally, if no LNG import facility is constructed on the north shore of the island, all of PREPA's natural gas supply would come through two LNG import terminals, at EcoElectrica and Aguirre. This heavy dependence on two centralized pieces of infrastructure would increase vulnerability to supply disruptions.

2. The risk that delivered natural gas prices will increase faster than expected

PREPA's integrated resource plan presents a forecast of natural gas prices through 2035. In constant 2015 dollars, PREPA's forecast shows natural gas prices at the Henry Hub increasing 50% from 2016 through 2035. While this is consistent with current futures prices at the Henry Hub, natural gas prices are currently at historically low levels and could rise faster than PREPA expects.

PREPA's forecast factors in the cost of shipping and liquefaction of natural gas. The shipping cost is assumed to be \$3.5/MMBTU, but the integrated resource plan includes the following notation: "Information managed by PREPA indicates natural gas adders of \$5.5/MBtu; the interpretation of the Consulting Team is that this natural gas adder may be lower in a scenario without financial restrictions for PREPA. This said, it was considered that 3.5 US\$/MBtu can be appropriate shipping adder to natural gas."⁷

Even a relatively small increase in natural gas prices or shipping prices above the forecast would have significant financial implications for PREPA. By 2030, under its preferred scenario, Puerto Rico will be spending more than \$1 billion a year on imported natural gas. Thus, even a 10% increase in the price of natural gas or in its shipping costs would cost the island over a \$100 million annually. Similarly, an increase in the "shipping adder" from \$3.5/MMBTU to \$5.5/MMBTU would increase natural gas import costs by about \$250 million a year by 2030.

Moreover, even a temporary spike in natural gas prices could result in tens or hundreds of millions of dollars in unanticipated expenses that would be passed on to ratepayers.

3. The risk of a price on carbon emissions

Because PREPA's three proposed scenarios do not seriously evaluate solar and wind energy possibilities, they include very little variation (less than 15%) in carbon emissions between the scenarios. PREPA's proposed reliance on natural gas under any of its scenarios would be a liability if, as seems likely, a price is imposed on carbon emissions in Puerto Rico.⁸

⁷ PREPA, "Integrated Resource Plan Volume 3", August 17, 2015, page 2-16.

⁸ The U.S. Environmental Protection Agency's recently released "Clean Power Plan" does not include a target for Puerto Rico, but the agency says that it will "continue to collect data that can form the basis of standards for power plants there in the future." (<http://www.epa.gov/airquality/cpp/fs-cpp-state-goals.pdf>)

The Role of Renewable Energy in Puerto Rico's Energy Future

PREPA's integrated resource plan does not evaluate any alternative scenarios with high penetration of wind and solar. The scenario with the greatest amount of renewable energy merely contemplates meeting the existing renewable portfolio standard, which calls for 20% renewable energy by 2035. PREPA's preferred scenario would achieve only 15% renewable energy by 2035.

PREPA's integrated resource plan also lacks any scenario that includes greater investment in energy efficiency. All of PREPA's scenarios assume that the island is able to meet 80% of its existing energy efficiency policy, which calls for a 5% reduction in energy use each year by government agencies, public corporations and municipalities from 2015 through 2022.⁹ The integrated resource plan does not contemplate PREPA investing in energy efficiency rebate or incentive programs to help its customers save electricity.

The omissions of more aggressive scenarios for wind, solar and energy efficiency from the integrated resource plan are striking, in no small part because wind, solar and energy efficiency investments are very cost-competitive in Puerto Rico. PREPA is currently purchasing solar through four contracts for about 19 cents per kWh, competitive with the cost of generating power at its major power plants (see Figure 5, below).¹⁰ PREPA is also currently purchasing wind power from two contracts priced at 15-16 cents per kWh.¹¹

Energy efficiency is almost always a utility's least expensive resource. According to a recent review of energy efficiency programs in the U.S., the cost to a utility to save a kWh of electricity averages 2.8 cents per kWh, with a range of 1.3 to 5.6 cents per kWh.¹² This is almost always less expensive than generating the same unit of power. Utilities have many avenues to invest in energy efficiency, including by offering rebates for more energy efficient appliances; providing home energy audits; and providing incentives to industrial energy users to improve the efficiency of their processes.

PREPA's record on energy efficiency has been terrible. A recent review by the American Council for an Energy Efficient Economy ranked Puerto Rico last among all U.S. states and territories in energy efficiency savings.¹³

Many states, in the meantime, are making major investments in energy efficiency. For example, in the Pacific Northwest, where retail electricity rates are less than half of Puerto

⁹ PREPA, "Integrated Resource Plan Volume 3", August 17, 2015, page 1-19.

¹⁰ PREPA, "Other Information Required in the Regulation on Integrated Resource Plan for the Puerto Rico Electric Power Authority," July 2015.

¹¹ Ibid.

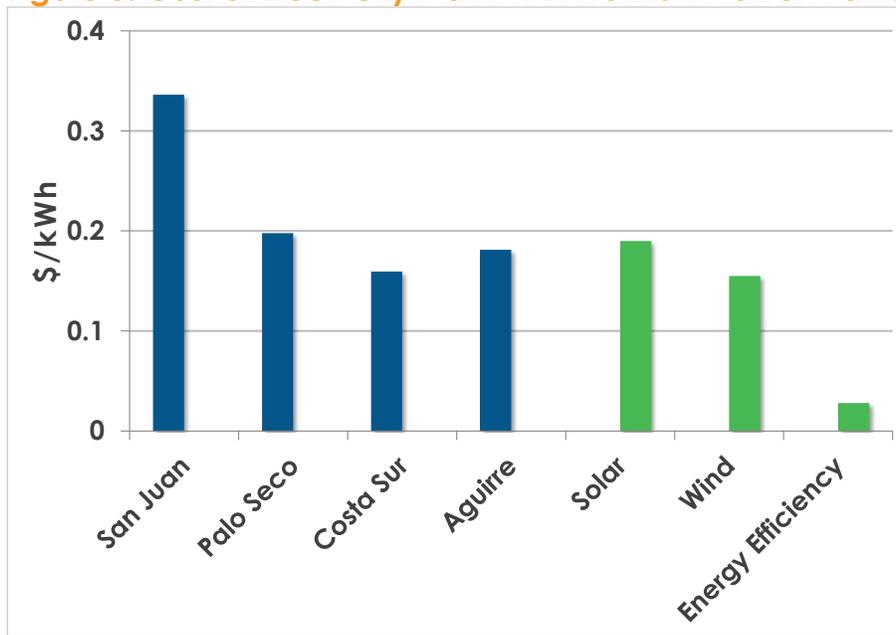
¹² M. Molina, "The Best Value for America's Energy Dollar: A national review of the cost of utility energy efficiency programs," American Council for an Energy Efficient Economy, March 2014.

¹³ A. Gilleo, A. Chittum, K. Farley, M. Neubauer, S. Nowak, D. Ribeiro, and S. Vaidyanathan, "The 2014 State Energy Efficiency Scorecard", American Council for an Energy Efficient Economy, October 2014.

Rico's rates, utilities continue to find energy efficiency investments to be cost-effective. Since 1980, energy efficiency has met more than half of load growth in the Pacific Northwest, or enough to power the entire state of Oregon.¹⁴

Figure 5 compares the current cost of electricity from existing generation resources owned by PREPA to the existing cost of wind and solar contracts and the likely cost of energy efficiency programs.

Figure 5: Cost of Electricity From PREPA's Main Power Plants Versus Alternatives



Wind, solar and energy efficiency offer additional advantages beyond their relatively lower cost in Puerto Rico:

- They have no ongoing fuel costs.
- They offer a hedge against future fuel price increases and volatility.
- They lead to cost savings by avoiding the need for some transmission and distribution system upgrades.
- The cost of solar is coming down rapidly. For small residential and commercial solar systems, the installed price fell 9-10% in 2014 and has fallen 6-12% per year from 1998 to 2014.¹⁵
- Investments in energy efficiency, wind and solar have the potential to keep more money circulating in the Puerto Rican economy. From fiscal years 2012 to 2014, PREPA spent an

¹⁴ T. Eckman, "Using Energy Efficiency as a Resource Option: Three decades of experience from the Pacific Northwest", presentation at Energy Finance 2015, New York City, March 17, 2015.

¹⁵ G.L. Barbose and N.R. Darghouth, "Tracking the Sun VIII: The installed price of residential and non-residential photovoltaic systems in the United States," Lawrence Berkeley National Laboratory, 2015.

average of \$2.5 billion annually on imported fossil fuel for its own generating plants (this figure does not include money spent for imported coal and natural gas for the independent power plants that PREPA buys power from).¹⁶ By 2035, according to PREPA's fuel cost estimates, PREPA will be spending \$1.2 billion a year on imported fossil fuel (mainly natural gas) for its own generating plants. By investing more in wind, solar and energy efficiency, on the other hand, Puerto Rico has the potential to develop domestic industries that would contribute to economic development on the island—a potential that is lost so long as Puerto Rico continues to rely on fossil fuels (for the simple reason that the island has no oil or natural gas resources).

Technically, wind and solar could supply more than 100% of Puerto Rico's electricity needs. A 2009 study from the University of Puerto Rico concluded that just 10% of Puerto Rico's wind and solar resources could generate 33.3% of the island's 2006 electricity demand (or 39% of 2014 electricity demand).¹⁷

Puerto Rico has failed to prioritize development of its wind, solar and energy efficiency resources. Indeed, Puerto Rico fails to rank among the top ten in the U.S. in terms of installed solar capacity per capita.¹⁸ In terms of installed wind capacity, Puerto Rico ranks 33rd among U.S. states and territories as of June 2015.¹⁹

PREPA offers no energy efficiency incentives to customers, even though such incentives would be far cheaper to the utility than continuing to generate power at existing PREPA plants.

PREPA has also been faulted for undermining investor confidence in solar investments in Puerto Rico. In 2013, PREPA placed a moratorium on development of projects under existing solar contracts and attempted to renegotiate the price of those contracts, which had been negotiated under a previous administration.²⁰ Even if there were problems with the manner in which those contracts were procured, the renegotiation of existing contracts coupled with a failure to prioritize new solar contracts has had the net effect of making investors wary of investing in solar projects in Puerto Rico.

Despite Puerto Rico's vast potential for wind and solar energy development, PREPA claims that its antiquated electrical system does pose challenges for integrating variable renewable energy. PREPA currently relies mainly on steam turbine generators (running on oil), which are designed to operate at a fixed level of power output. Because the output of renewable energy sources varies throughout the day, such sources need to be matched with power plants whose output can be ramped up or down according to how much electricity is being generated by the wind and solar sources. In more modern electrical systems, this match is typically achieved with natural gas combined cycle turbines, which have the ability to rapidly vary their output.

¹⁶ PREPA, "Other Information Required in the Regulation on Integrated Resource Plan for the Puerto Rico Electric Power Authority," July 2015.

¹⁷ A.A. Irizarry-Rivera, J.A. Colucci-Ríos, E. O'Neill-Carrillo, "Achievable Renewable Energy Targets for Puerto Rico's Renewable Energy Portfolio Standard," Universidad de Puerto Rico, 2009.

¹⁸ Solar Energy Industries Association, "2014 Top 10 Solar States," <http://www.seia.org/research-resources/2014-top-10-solar-states>

¹⁹ U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, "Current Installed Wind Power Capacity (MW)," June 30, 2015: http://apps2.eere.energy.gov/wind/windexchange/wind_installed_capacity.asp

²⁰ "PREPA clarifies compliance procedures for private renewable-energy projects," Caribbean Business, December 13, 2013.

About a quarter of PREPA's current capacity consists of combined cycle units (some of which run on diesel). PREPA has argued that this amount of combined cycle capacity is not sufficient to allow PREPA to meet the renewable portfolio standard target of 20% renewable energy by 2035 without significant curtailment of the renewable energy output. But, although PREPA has identified this lack of combined cycle capacity as a constraint in developing further wind and solar resources, PREPA has not analyzed the amount of backup natural gas combined cycle generation that would actually be required in a scenario with high penetration of renewables. Nor has it constructed such a scenario for its integrated resource plan.

PREPA Can Be a Leader in Energy Efficiency, Solar and Wind Energy

In short, the time is ripe to develop energy efficiency, solar and wind energy resources in Puerto Rico. PREPA needs to transition its antiquated electrical system away from its reliance on imported oil for both environmental and financial reasons.

Because it is an island surrounded by rising seas, Puerto Rico is especially vulnerable to climate change. Puerto Rico today has the opportunity to be a leader in the global shift toward less carbon-intensive forms of electricity, including solar, wind and efficiency.

PREPA plans currently to transition from an over-reliance on oil to an over-reliance on natural gas. PREPA will invest more than \$3 billion over the next 10 years under this plan. These capital investments will lock Puerto Rico onto a natural-gas-dependent path, crowding out solar, wind and efficiency. PREPA's failure to perform a serious analysis of solar, wind and efficiency development renders its current integrated resource plan inadequate.

Part 2: The Broader Puerto Rico Debt Crisis and PREPA

PREPA faces a substantial financial challenge. It is carrying too much debt—\$8.3 billion – and is unable to meet its debt obligations.

On Sept. 2, PREPA released a tentative debt-relief plan that it negotiated with a portion of its bondholders. PREPA has disclosed that the plan would provide for an 85% exchange rate on a portion of PREPA's indebtedness, that is, bondholders would receive 85% of principal.

Before it can be finalized, however, the deal will need approval from a number of additional parties, including legislators, other bondholders, regulators, rating agencies, and others.

IEEFA makes the following recommendations on next steps in the debt-restructuring process:

- 1) That PREPA make additional efforts in the coming weeks to secure deeper principal reductions from bondholders and insurance companies in order to provide itself greater financial flexibility.
- 2) That PREPA acknowledge the 85% level of bond recovery is too generous to bondholders and will undermine PREPA's efforts at long-term financial reform and frustrate investment in new energy resources.
- 3) That whatever debt improvements PREPA ultimately makes be used to make room for prudent investments in solar energy, wind energy, and energy efficiency and not for an increase in the agency's reliance on natural gas.

Overview of Proposed Debt Deal

A group of investors in PREPA's bonds have been negotiating with PREPA since August 2014 to find a way to manage PREPA's \$8.3 billion debt portfolio. Various plans²¹ have been floated to develop a consensus among bondholders, insurers, rating agencies, public officials and the people of Puerto Rico. During this process, rating agencies have commented on the fiscal conditions of Puerto Rico and the type and likelihood of a negotiated settlement.²² The August 2014 Forbearance Agreement, a benchmark document that structured the financial reporting and negotiation process, has been amended six times.

PREPA disclosed in a formal filing to the Municipal Securities Rulemaking Board (MSRB) on Sept. 2 that the parties had come to a tentative debt-relief plan for the agency.²³ In broad form,

²¹ <http://emma.msrb.org/ER906457-ER708173-ER1109700.pdf>, p. 63.

²² Moody's Investor Services, *Frequently Asked Questions About Puerto Rico's Fiscal and Debt Crisis*, July 22, 2015. (Moody's FAQ)

²³ <http://cdn.bondbuyer.com/pdfs/PREPA-09-02-15.pdf> (PREPA-09-02-15). Although the three insurance companies were part of the original Agreement and all six amendments, one insurance company, National Public Finance Guaranty has dropped out of the Forbearance arrangement in the September 2, 2015 filing.

the deal says that bondholders will exchange approximately \$5.8 billion in outstanding, uninsured debt for 85% of original value paid (a 15% reduction of principal) and that refinancing will occur through a new PREPA subsidiary and backed by a new dedicated surcharge on electricity.

The combination of principal reduction and refinancing is expected to provide PREPA with near-term debt-service relief and lower interest rates. The insurance companies that have insured the debt would participate in a series of refinancings related to their obligations, but the benefits to PREPA of the insurance company participation are unspecified at this time. To be enacted, the new plan requires approval by the Puerto Rican legislature, an investment-grade rating from at least one bond-rating agency, and an increase in electricity rates. The Forbearance Agreement has been extended until Sept. 18.

Key Points of the Plan

Principal Reduction

The deal addresses the bondholders who are uninsured (described in the proposal as “unwrapped”). The overview of the proposal identifies \$5.8 billion²⁴ as the amount of exposure of the unwrapped bondholders, out of the total debt of \$8.3 billion.

The deal was negotiated by a group known as the “Ad Hoc Group of Bondholders,” which holds 35% of the total amount of outstanding bonds. The Ad Hoc Group of Bondholders Exchange Sheet, included in the public filing, says that the Ad Hoc Group will exchange all of its bonds at an exchange ratio of 85%. The proposal says that most of the uninsured bondholders who are not part of the Ad Hoc Group must agree to participate in the plan before it will become effective (only \$700 million of the bonds can be left outstanding, although this amount is subject to change by PREPA). The document also identifies an unspecified backstop arrangement, presumably for non-participating bondholders.²⁵

Analysis and Comment: If 100% of the bondholders participate in the 85% exchange, the principal reduction presumably would equal \$870 million (15 percent of \$5.8 billion). In a public statement on Sept. 2, however, Lisa Donahue, the chief restructuring officer for PREPA, said that the total amount of principal savings projected is \$670 million.²⁶ This assertion is made difficult to decipher in part because the MSRB contains no formal statement of the aggregate principal reduction and several sections of the statement related to the transactions benefit are redacted.

²⁴ PREPA-09-02-15, p. 3.

²⁵ The NY Times reports that for some investors a cash tender with a 35% principal reduction may be offered.

http://www.nytimes.com/2015/09/03/business/dealbook/puerto-rico-reaches-deal-with-electric-utility-bondholders.html?_r=0

²⁶ <http://www.reuters.com/article/2015/09/02/usa-puertorico-idUSL1N1180GS20150902>

Thus, absent the release of a full budget and financial plan by PREPA, public statements about the actual principal reduction or annual debt service savings should be seen as speculative and viewed with caution.

The number that is clear in the formal filing is the exchange ratio, stated as 85%. This contrasts with Moody's Investor Services recent estimate of PREPA's likely recovery rate, which Moody puts in the range of 65% to 80%.²⁷ PREPA's agreement exceeds Moody's high-end settlement parameter, a fact that suggests the settlement is quite generous—and likely overly generous—to bondholders. This settlement would be particularly lucrative to hedge funds that own bonds typically purchased at a discount.²⁸

Had PREPA secured a deal closer to the lower end of the Moody's range, the principal reduction could have been as high as \$2 billion (35% of \$5.8 billion).

Role of Insurance

The proposal filed with the MSRB identifies \$2.5 billion in exposed bonds that are insured (described as “wrapped”). The proposal says it provides a “path to full repayment over time and protection from payment under existing policies.” This language is unclear, and the remainder of the proposal appears to describe an arrangement whereby PREPA maintains debt service payments for these bonds.

Analysis and Comment: Absent additional details and explanation, it appears that PREPA gains no principal reduction, short- or long- term debt service savings, or relief from the current negotiated settlement with the insurance companies.

Financial and Legal Risks

The completion of the deal requires actions by a number of decision makers beyond PREPA's control. How these decision makers are managed may materially alter the agreement. The next steps in the process require the following actions:

1. Negotiations completed regarding the \$2.5 billion in bonds that are insured. This will have an important impact on PREPA's operating budgets and financial planning.
2. “Legislative authority for the securitization and other legislative changes related to restructuring of PREPA,” as noted in the MSRB. These proposed changes would include the creation of a new PREPA subsidiary with the necessary financial protections to make it “bankruptcy remote” and include governance reforms that would make PREPA more independent of political control. Legislative authority would also be required for bond issuances.

²⁷ Moody's FAQ, p. 2.

²⁸ <http://www.bondbuyer.com/news/regionalnews/prepa-forbearing-bondholders-reach-agreement-on-restructuring-1083637-1.html>

3. An investment-grade rating by at least one of the three major rating agencies.
4. Support from the remaining unwrapped, unaffiliated bondholders (some of these bondholders' financial options short of a buy-in on the bond exchange remain unspecified).
5. A new surcharge on the price of electricity. PREPA does not have independent rate-setting authority but is subject to regulatory oversight by the Puerto Rico Energy Commission. Assuming that PREPA secures short- and long-term debt relief, it remains to be seen how a rate surcharge, which may or may not be reflected in an aggregate rate increase, could be justified. There is no discussion in the documents as to how the cost savings from the debt relief would be applied to improve PREPA's rate system.

Recommendations

A new debt agreement for PREPA could provide the agency with financial flexibility and a platform to launch a new energy plan for Puerto Rico. The opportunity for improving the agency's financial condition makes the issues about the future of electric generation in Puerto Rico more salient than ever.

Solar, Wind, and Energy Efficiency

The case for solar, wind and energy efficiency is strengthened by the scope and current details of the debt deal. The debt deal is modest, and will provide some additional borrowing power if handled prudently. However, if PREPA's energy plan moves forward with an overreliance on natural gas, it is likely that PREPA will need to borrow more money for project development. Whether or not the borrowing comes with federal guarantees, the debt encumbrances are likely to be large and will crowd out other investment opportunities for Puerto Rico. Natural gas brings price volatility, the same problem the commonwealth has had with oil as an energy source.

If, however, PREPA were to adopt a plan with greater reliance on wind, solar and energy efficiency, it would have a chance to create a new industry in Puerto Rico with long-term local employment opportunities. A turn toward these resources would introduce an energy system with a more stable long-term price for electricity. Reducing price volatility in Puerto Rico's energy system would prove to be an invaluable asset. In addition, the agency would be able to reduce rates gradually over time when capital expenditures are paid off, because there are no fuel costs associated with wind, solar, and energy efficiency. Another potential financial advantage is the possibility of receiving federal incentives for investments in solar energy. These incentives can be used to increase investment in Puerto Rico's energy grid and its economy. Unlike a natural gas build-out scenario, solar, wind and energy-efficiency investments do not have to translate into a mounting debt load for PREPA.

Deeper Principal Reduction

PREPA should try to achieve deeper principal reductions as it moves toward closing this agreement.

Below are five core points that should inform negotiations as they proceed:

- The 85% exchange rate is considerably more generous—in fact too generous—to bondholders than Moody's has estimated would be practical. Selling PREPA's financial needs short will simply undermine the financial integrity of the authority.
- Hedge funds, which bought into PREPA bonds at a discount, stand under the current deal to sell their debt back at a profit. This is unseemly both in perception and reality and undermines any sense of shared sacrifice that other stakeholders have been trying to impart.
- PREPA's electricity rates are too high. The combination of expensive generation and too much borrowing have made the rates oppressive to residents and hurt Puerto Rico competitively and economically. Failing to protect ratepayers undermines future economic growth.
- PREPA's negotiators have taken an extraordinarily narrow view of these negotiations and of Puerto Rico's interests. Contrast the level of pressure being placed on Puerto Rico to pay back the PREPA debt of \$8.3 billion, for example, with the collective asset base of the bondholders. That collective asset base of even an incomplete list of bondholders and insurance companies tops \$8 trillion dollars.²⁹ These investors have global holdings and therefore enjoy the benefit of hedging the current weaker economic performance of Puerto Rico against stronger performers elsewhere. If PREPA were to pay back 40% of its debt, or \$3.3 billion, then the resulting \$5 billion loss to bondholders would constitute less than one tenth of 1% of the value of their portfolios (even by conservative valuations).
- Transparency is in the public interest, and public disclosure of the status of these negotiations is required as alongside additional approvals needed to complete this transaction.

²⁹ See Appendix I

Appendix I: Partial List of PREPA Bondholders

Table I: Ad Hoc Group of Bondholders (Signators to the Recent Forbearance Agreement With PREPA) - Company Assets Under Management in Billions of Dollars

Company	\$AUM
Franklin Advisers	513
Oppenheimer	232
Angelo Gordon	32
Blue Mountain	21
Appaloosa Management	20
Redwood Master Fund	17.4
Knighthead Capital Management	5.7
Total	\$841.10

Table II: Group of Bondholders Identified from Search of 100 PREPA CUSIP's (Company Assets Under Management and Market Capitalization in Billions of Dollars)

Company	Assets Under Management & Market Capitalization
Vanguard Group Inc.	3000
Goldman Sachs Asset	1178
T. Rowe Price Group, Inc.	746
AllianceBernstein	488
Federated Investors	349
Columbia Management Investment Advisers	343
Eaton Vance Management	307
Dreyfus Corporation	200
American Century Investments	141
Lord, Abbett & Co. LLC	136
Waddell & Reed Financial	123
Genworth Financial, Inc.- Mortgage	83
Ivy Funds	40
Prudential Financial, Inc.	33.47
Federal Insurance Co.	27.0
Atlantic Specialty	1.30
Total	7196.77

Table III: Market Capitalization of Three Insurance Companies Identified in PREPA Forbearance Agreement as Insurers³⁰

Company	Capitalization
Assured Guaranty	3.40
Synacore	2.80
National Public Finance Guaranty	1.08
Total	7.28

³⁰ Insurance companies do not take losses in the same way that a money management fund takes a loss. Insurance companies collect premiums and pay out claims. The potential claims in Puerto Rico are a material risk to the insurance companies. How the risk is managed by the company is critical component of the successful resolution of the problem for PREPA and the Commonwealth.