
PUBLIC COLLABORATIVE FOR PUERTO RICO'S ENERGY TRANSFORMATION

REPORT BY ICSE AND RMI, OCTOBER 2018



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EXECUTIVE SUMMARY

The devastation caused by Hurricanes Irma and Maria unveiled the opportunity for and urgency of a significant reformation of Puerto Rico's electricity system. The many co-creators collaborating on this document found that the storms inspired a recognition that stakeholders have more in common than what divides them:

- Electricity outages affect everyone and threaten lives.
- To be successful, the electricity grid must serve everyone reliably and efficiently.
- Business as usual in Puerto Rico is not an option. A new culture and ethos focused on the public interest needs to take hold.

Leaders from different sectors have gathered to define the future of the Puerto Rico power grid. This report documents the results of a Collaborative conducted to discuss and work together to build

a new policy for the electricity system in Puerto Rico. During four days of focused discussions, concerned citizens from a wide variety of Puerto Rican organizations came together. Participants identified opportunities for change in four areas:

1. The Promotion of a Vision for Self-Sufficiency and Credibility. The promotion of a vision for the future with a consistent public policy should include transforming the energy sector from big asset management to technology management with the coexistence of small generation capabilities, freely developed by autonomous consumers (called “prosumers”),¹ and a base generation that is highly flexible and reliable with enough spare capacity to be used as backup, along with a quick increase in renewable penetration.

To change the vision of public policy to put the common good and the people at the center of



PHOTO: SCOTT ESPLIN

¹ Terms and acronyms are defined in the Glossary (Appendix A).

the transformation will require an energy sector based on distributed, endogenous, clean, renewable energy that is affordable, promotes efficiency, ensures equity, encourages ample public engagement and capacity building, and creates local wealth while maximizing local ownership. This transformation will entail increasing the current Renewable Portfolio Standard (RPS) to achieve 50% by 2035 and 100% by 2050. It will also include mechanisms for funding and ensuring equitable access.

2. An Independent Regulator with Enforcement

Powers. The legal impunity of the Puerto Rico Electric Power Authority (PREPA) must be removed in order to ensure that there will be an independent regulator with enforcement powers. A predictable legislative and regulatory regime that allows for real-world finance and economics will create investor confidence. This will bring about a healthy prosumer energy sector and make way for public policy that reflects and supports the people of Puerto Rico.

3. A Modern Regulatory Framework and Integrated Resource Plan (IRP).

The regulatory framework will be sufficiently flexible to reflect and incorporate the benefits from continued innovation. New local legislation will prevent the IRP requirements from being circumvented, incentives will be provided for renewable energy, and a program of local research and development will be implemented.

4. The Involvement of Cooperatives and

Municipalities in the Transition. The energy generation process will be made democratic by enabling nontraditional companies such as energy cooperatives. The regulatory framework will be created to incentivize this idea via participatory public-private partnerships (PPPs), multisectoral proposals, and business models.

Specific recommendations for implementing these principles are presented in the Group Discussion and Recommendations section, which reflects the content of focused citizen discussions. The Collaborative, which produced the foregoing recommendations, demonstrated a model for facilitating the co-creation of recommendations for the energy sector in Puerto Rico.



PHOTO: JEFF MILLER

INTRODUCTION



PHOTO: JOE PIETTE

BACKGROUND

This report represents a diverse collaboration toward a vision of transforming Puerto Rico's electrical system that was severely affected by the storm events of 2017. On May 28, 2018, the Institute for a Competitive and Sustainable Economy (ICSE) and Rocky Mountain Institute (RMI) began an inclusive Public Collaborative process to identify specific policy recommendations for key local and federal decision makers, including the Puerto Rico Legislature, based on a diverse representation of the Puerto Rican public sector, the government, and the private sector. The process began with individual interviews of 41 participants representing different components of Puerto Rico's society.

On July 19 and 20, 2018, ICSE and RMI convened with 41 participants from Puerto Rico's public sector including commercial and for-profit companies, noncommercial nonprofit organizations, academia, and the government to co-create policy recommendations to be considered by local and federal entities, including the design of forthcoming energy legislation by Puerto Rico Senators Seilhamer and Bhatia. Prior to the workshop, ICSE and RMI interviewed energy sector stakeholders to identify objectives for the workshop.

An anonymized summary of those conversations is included as part of this report.

Puerto Rico's Act 120 of June 20, 2018, the "Transformation of the Electrical System of Puerto Rico Act," requires the legislature of Puerto Rico to develop new policy recommendations within 180 days of its passage, essentially by the end of the next legislative session. The recommendations included in this report reflect the diversity of perspectives from participants in support of the design of a new energy policy and a vision for the Puerto Rico electric system, including varying views on recommendations for policymakers to consider. The process to develop these recommendations included two workshops and an intensive iterative editing process.

Participants worked during meetings in July and August 2018 in Rio Grande and San Juan to produce this report in facilitated sessions and through repeated drafts of the document before and after the meetings. The recommendations contained herein are the product of this entire group and not that of any single participant or set of participants. This document contains both areas of agreement and disagreement. Participation in this process does not imply unconditional endorsement or support of the recommendations herein.

Participants include the following:

- Alejandro Uriarte, New Energy
- Arturo Massol, Casa Pueblo
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- Chris Rauscher, Sunrun
- Eduardo Bhatia, Puerto Rico Senate
- Fernando Abruña
- Francisco Rullán, State Office of Energy Policy
- Geraldo Cosme, Chamber of Commerce of Puerto Rico
- Héctor García, Coalición por la Cooperación Energética
- Ingrid Vila Biaggi
- Jaime Cuevas, Cooperativa de Seguros Múltiples de Puerto Rico
- Jaime García, Puerto Rico Manufacturers Association
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- Javier Baella
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- Rafael Rojas, Puerto Rico Hotel and Tourism Association
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- Rodrigo Masses, Puerto Rico Manufacturers Association
- Rubén González, Municipality of Villalba
- Ruth Santiago
- Sylmari De La Torre, Puerto Rico Senate
- Tanuj Deora, Smart Electric Power Alliance
- Xavier Vives, Gas Natural Puerto Rico—Naturgy

The endorsers of this report—all of whom either come from invited organizations or are individuals asked to participate in the co-creation—express their support of the document and recommendations herein. The support includes recognition of the areas of agreement and disagreement in the report.



This document is endorsed by the following:

- Alejandro Uriarte
- Fernando Abruña
- Jaime Cuevas
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- Centro Unido de Detallistas
- Chamber of Commerce of Puerto Rico
- Coalición por la Cooperación Energética
- College of Engineers and Land Surveyors of Puerto Rico
- Cooperativa de Seguros Múltiples de Puerto Rico
- Instituto Nacional de Energía y Sostenibilidad Islaña de la UPR (INESI)
- Association of Mayors of Puerto Rico
- Puerto Rico Builders Association
- Puerto Rico Manufacturers Association
- Relimagina Puerto Rico
- Solar and Energy Storage Association of Puerto Rico
- Sunrun
- US Green Building Council—Caribbean Chapter
- Windmar Group

The workshop included presentations and coaching from a group of expert faculty members. These faculty members are listed in Appendix B, which also includes a copy of the presentations. We thank the participants and faculty for their contributions to this effort.

WORKSHOP OBJECTIVES

Before the workshops, ICSE and RMI conducted detailed interviews of participants to understand major issues, opportunities, and every other consideration that would make the Collaborative successful. Participant interviews started on May 28 and lasted through July 13, 2018. The result of this evaluation revealed the following objectives, which governed the two workshops:

1. Provide an open and collaborative space for participants to share their perspectives regarding the transformation of the energy sector in Puerto Rico and, in the process, clarify areas of agreement and disagreement in their views for the future.
2. Generate input for policymakers to consider in developing laws and regulations in the future, including but not limited to the following:
 - a. the regulatory framework;
 - b. targets for generation mix over time (short, medium, and long term); and
 - c. ownership structure and contracting process of the utility.
3. Build trust between the participants to enhance collaboration, during the working sessions and afterward, while working together productively even when disagreements may continue to exist.



PHOTO: TOMÁS J. TORRES PLACA

GROUP DISCUSSION AND RECOMMENDATIONS

1. The Promotion of a Vision for Self-Sufficiency and Credibility²

This vision is presented as the foundation of the new energy public policy. It aims to change the energy equation to focus on self-sufficiency and to put the common good and the people, the consumer, at the center of the energy transformation.

WHERE WE ARE NOW

Puerto Rico's power system is predominantly fossil fuel based. In the fiscal year ending June 30, 2017, 47% of Puerto Rico's electricity came from petroleum, 34% from natural gas, 17% from coal, and 2% from renewable energy, according to the US Energy Information Administration.

The Vision For A Future Of Energy Self-Sufficiency

The following is proposed as a public policy statement to be adopted by law:

An energy sector based on distributed, endogenous, clean, renewable energy that is affordable and resilient, promotes efficiency, internalizes climate change and decarbonization, ensures equity, encourages ample public engagement and capacity building, creates local wealth while maximizing local ownership, and provides flexibility for innovation consistent with endogenous, clean, renewable energy.

The energy vision is bigger than PREPA. Energy democracy—the participation of people and

communities—can serve as a mechanism to reduce poverty (45% in 2016) and levels of inequality (GINI index of 0.54³).

Any model should be in the best interest of the people, the consumer, not in the best interest of PREPA, the government, or any specific private parties, and should be focused on people rather than individual entities with social and economic equity as its foundation.

The vision includes increasing current RPS to reach 50% by 2035 and 100% by 2050,⁴ adopting energy efficiency targets, and ensuring the phasing out of fossil fuel facilities with specific deadlines and a specific date for the end of each fossil fuel. It prioritizes clean, renewable, distributed generation on rooftops, parking lots, landfills, brownfields, and other like-terrain to the greatest extent possible instead of greenfields.

The vision must include incentive mechanisms to make it viable. Local wealth and local ownership goals require the government to remove roadblocks that have historically hindered local companies and local investments, thus simplifying interconnection processes to avoid excessive unjustified delays to propel and protect net metering.

² The vision developed by a group of participants does not necessarily represent the consensus of the entire group convened for the Public Collaborative. There was a lack of consensus regarding local ownership as well as future generation mix, in particular the mix of natural gas and renewables. These nuances are reflected in the report text.

³ Source: World Bank, 2016

⁴ As explained in this report, this target and other aspects of the development and transformation of the electrical system are implemented by the independent regulator through the Integrated Resource Plan (IRP). The IRP is a 20-year planning tool used within utility planning and regulatory processes. The current IRP cycle is due in 2035, currently in revision by the Puerto Rico Energy Bureau (formerly Puerto Rico Energy Commission). The target of 50% RPS by 2035 falls in a first IRP planning period and the target of 100% RPS by 2050 would fall into a second IRP planning period, as part of the gradual development of the RPS within a regulatory process.

This vision for the energy public policy is built upon the following principles and values

1. Ensure the quality and continuation of life, recognizing the interconnected nature of human health and energy security along with human flourishing and well-being.
2. Focus generation and system design on clean, locally sourced, renewable energy that is environmentally and economically sustainable; maximizes the services and benefits of renewable energy and battery energy storage; and provides reliable, affordable, and financeable service.
3. Ensure that the system is clean, efficient, and resilient, acknowledging the importance of reducing carbon emissions while building a system that can respond to increases in severe storms and other climate impacts.



PHOTO: CHRISTOPHER T. TORRES, FACULTY SESSION DURING JULY 2018 MEETING

4. Guarantee energy access in all the communities through various modes such as Universal Service and other mechanisms⁵ to deploy photovoltaics (PVs) to poor, underserved, and isolated communities.
5. Ensure equitable treatment of labor, including both public-sector and private-sector workers.⁶
6. Eliminate political interference in the electricity industry in Puerto Rico.

Ownership

Participants agreed that every transaction, every investment, and the development of the Puerto Rico electric system as a whole should maximize the multiplier effect in the Puerto Rican economy and that ownership should transition toward more distributed and localized clean renewable energy.⁷ A group of participants also agreed on the following:

1. Policymakers should consider disconnecting the volume of electricity sales from utility profits through performance-based regulation, decoupling, or other mechanisms.
2. The government should focus on removing barriers from the ownership of energy resources and not be so restrictive as to prevent new models from developing. Different models may emerge for distributed generation and central generation.
3. The focus should be on “maximization of local ownership” defined as promoting and maximizing ownership in the hands of the citizens, communities, cooperatives, municipalities, and other entities of Puerto Rico in coexistence with private sector participation to maintain the vision.

⁵ There was a wide consensus on developing funds/programs and mechanisms to make renewables a possibility for poor, underserved isolated communities. However, there was a lack of consensus as to the model to be adopted.

⁶ Although there was not adequate time to discuss the labor transition, some participants showed concerns in terms of the treatment of labor in the energy transition in Puerto Rico and encouraged policymakers to consider and engage labor interests.

⁷ Individual investment in non-renewable distributed energy as diesel and propane gas generators for backup and combined heat and power (CHP) for business may be necessary.

Generation Mix

The vision for a generation mix in Puerto Rico includes the following:

1. A diverse energy resource mix moving quickly toward a predominantly renewable future and reduction in environmental impact.
2. Removal of coal and petroleum in the shortest time frame possible.⁸
3. Promotion of distributed generation projects that are self-sufficient with a particular focus on renewables.
4. Accelerated deployment of renewable energy potentially funded by a carbon tax or a fossil fuel import tax.⁹
5. Incentives for the development of distributed generation projects and the prevention of barriers to distributed generation and renewable resources.
6. Systematic plans for the education of the population about efficient energy use and consideration of an efficiency standard to provide incentives and financing for energy efficiency projects.
7. For industrial customers and other energy intensive customers with heating or cooling demands, certification of highly efficient combined heat and power (CHP) projects using the most efficient and modern technology.

The participants acknowledge that the transition from a system based mainly on fossil fuel to a highly renewable system should use the best technology available and an unbiased socioeconomic and technological analysis. This process will take time.

Participants discussed the use of natural gas along with renewable sources within the transition period, emphasizing the transitional, nonpermanent use of

natural gas. Participants also discussed whether any new natural gas infrastructure should be built beyond what already exists. Some participants expressed concern about considering only natural gas as a transition fuel without considering other options and the length of the transition time. The discussions focused on the following:¹⁰

1. Based on an understanding of the arguments that a substantial transition to renewables would take time, in the short and medium term, systems savings could be achieved through the use of natural gas instead of oil.
2. The savings in generation costs through the use of natural gas could be of such a magnitude that they could fund a higher penetration of renewables.

The participants did not come to a consensus about the duration of the transition. However, discussion on those terms emphasized the need for rapidly shifting away from fossil fuels toward a renewable energy system.



PHOTO: CHRISTOPHER T. TORRES, FACULTY SESSION DURING JULY 2018 MEETING

⁸ Savings on energy generation could be achieved through the use of natural gas as a transition fuel as discussed in this section.

⁹ Potential funding mechanisms are elaborated within the report, on point #5 of Recommendations to Policymakers in this section.

¹⁰ These discussions represent the agreement of most participants. However, some participants do not agree on the benefits of natural gas, its potential climate change implications and the adverse environmental effects on communities where natural gas is extracted by hydraulic fracturing.

PROPEL pathways toward clean renewable distributed energy

The participants stated the following needs:

1. Ensure distributed generation is addressed in the IRP and in future RPS as part of the goal of 100% clean renewable by 2050.¹¹ No new investment should be made that would lock in Puerto Rico to expensive long-term fossil generation contracts, limiting or preventing the deployment of distributed renewable energy.¹² Existing fossil fuel plants should be retired as soon as possible. Some of the participants believe, however, that the construction of new fossil fuel plants or retrofits should only be minimized, while others believe there should be no new investment in fossil fuel generation.
2. Ensure that generation and demand-side equipment meet the standards for energy efficiency and that energy efficiency targets are identified and achieved through governmental action.
3. Invest in energy literacy at the community level to maximize engagement and participation, and promote efficiency and conservation to move toward net zero energy.
4. Consider load shifting and demand response (DR) programs to lower the cost of the system via utility or third-party programs and integrate these demand-side resources in the IRP.
5. Encourage the placement of distributed generation closer to demand to improve system resilience. This may include microgrids at the personal, community, municipal, or regional level. Legal provisions should not constrain the transition from utility ownership toward local ownership.
6. For system redundancy and backup:
 - a. System maintenance needs to be viewed as the first line of defense to minimize outages and interruptions.
 - b. For industry and critical facilities, self-generation and microgrid systems should prefer renewables and storage, with CHP as an alternative, subject to regulatory oversight to minimize environmental contamination and health impacts.
 - c. Primarily landfills or brownfields need to be used for larger-scale renewable generating systems. Agricultural lands, greenfields, natural reserves, etc. should not be given preference for these projects.
7. Ensure greater affordability and access to renewable technology as costs keep coming down, considering marginal training and development costs.
8. Adopt bottom-up transformation with endogenous, clean, renewable resources and local ownership that would result in making the central public utility (PREPA) smaller, while allowing for the utility to participate in the development and transformation toward distributed generation.
9. Consider manufacturing or assembling solar panels locally and reinforcing research and development institutes (University of Puerto Rico [UPR] Mayaguez and the Polytechnic Institute) to develop renewable energy knowledge, technology, and manufacturing, which could lower costs and create businesses and jobs.
10. Do not consider or label waste incineration and other contaminating technologies as renewable energy resources.
11. Ensure equitable access to solar energy and other clean energy technology, and do not limit these technologies to higher income customers. Carefully consider the use of subsidies for these technologies to accelerate equitable deployment, but ensure that the market does not become permanently reliant on subsidies.

¹¹Participants noted the importance of the objective of reevaluating the IRP over time to determine the lowest cost pathway to achieve this goal, recognizing that during the transition some fossil fuel investment may be needed.

¹²Participants emphasized that no new investment should be made in the retrofit of inefficient, dirty fossil fuel plants.

REWIRE centralized generation and governance structure

The participants stated the following:

1. Allow municipal or community self-generation without penalties or constraints (e.g., the Municipality of Villalba initiative to use hydroelectric power generation).
2. Create financial structures that leverage individual investment and other financing structures (e.g., cooperatives and government incentives) to allow for maximum local participation.
3. Ensure a multilevel governance structure that allows for flexibility and adaptability to address changes. This structure should enhance the ability of the grid to respond to demand shifts, allocate load management responsibilities, and compensate accordingly. The multiple levels should also ensure shared governance among an administrative structure, prosumers, microgrids, cooperatives, municipalities, etc.
4. Implement transparency and make relevant documentation available for all transactions, contracts, and dealings by any public or private entities that generate or provide energy services, and offer web transmission of board meetings. Although these requirements are already in the law, some effort must be made to make PREPA comply with them.
5. Instead of imposing a solar tax, determine reasonable and fair costs of benefits of renewable energy to address stranded costs and ancillary services. Reasonable costs can be accomplished through a value-of-solar study to determine the net value or cost of renewable energy on the grid in Puerto Rico.¹³

RECHARGE institutions that offer transparency and public access and can modernize our regulatory energy sector framework

The participants stated the following:

1. Provide a strong regulator to guide the transformation process.
2. Rewrite many aspects of Act 120 to provide the regulator with independence and strength, including ensuring that any privatization contracts¹⁴ comply with the IRP.
3. Choose commissioners by establishing a pool of candidates from representative sectors of society that is then presented to the governor for selection. The suggested slate of candidates should reflect the interests of grassroots and private and public stakeholders.
4. Ensure that renewable contracts protect consumers.
5. Ensure a regulatory framework that acknowledges and promotes multiple actors.



PHOTO: RMI TEAM, FACILITATING DURING THE WORKSHOP

¹³ Participants acknowledge that there was no consensus from the group as to how to manage interconnection and legacy costs. Others note that all credible “value-of-solar” studies demonstrate that when consumers go solar, it is a net financial benefit to the solar owner, the utility, and other customers.

¹⁴ There was no consensus as to whether privatization is the appropriate path forward. Some participants expressed concerns in this regard. Assuming privatization continues, these recommendations should be adopted.

Credibility Strategies:

1. Open any policy decision related to the energy sector of Puerto Rico to wide citizen participation in order to keep the public informed about changes and opportunities in the future system.¹⁵
2. Include desirability and convenience studies in Act 120 for all major PREPA transactions along with the evaluation and certification of such studies by the Puerto Rico Energy Commission (PREC).¹⁶ There should be public hearings on the studies, and all documentation should be available for public scrutiny in a timely manner.
3. Ensure a strong, independent regulator and a governance structure dedicated to transparency and accountability that values and strengthens the role of all stakeholders in the development of future policy and implementation.
4. Provide independence for energy institutions, free from political intervention or influence.
5. Focus on investor confidence and “financeability,” meaning that the vision toward self-sufficiency must be rooted in real-world economics. In contrast, some participants expressed the nonmonetary value of transition to self-sufficiency and that renewable endogenous energy should take precedence over economic considerations.



PHOTO: CHRISTOPHER T. TORRES

¹⁵ Some participants suggested that policy decision-making should consider the use of public referendums.

¹⁶ Puerto Rico Act 211 enacted on August 12, 2018 creates the Puerto Rico Energy Bureau (PREB). As such, the PREB has regulatory powers similar to its predecessor and replaces PREC.

Recommendations for Policymakers:

1. Design community resiliency hubs with renewables, storage, and other resilient components (e.g., water) to help communities respond and recover after extreme events.
2. Require foreign investors in the electricity system to set aside a percentage of capital to support Puerto Rico-based businesses and prioritize hiring of local labor.
3. Develop and fund research and development (R&D) institutions that propel the growth of renewables in Puerto Rico. The purpose of such institutions is to promote local solutions, including R&D, local solar panel manufacturing, and deployment. Those initiatives could further reinforce the UPR Mayaguez microgrid lab for microgrid modelling.¹⁷ Some participants proposed the creation of a new institution for those purposes, suggesting a name in accordance with such task: Renewable Energy Innovation and Manufacturing Institute (REIMI).
4. Keep or improve certain laws and policies:
 - a. Laws, regulations, policies, and incentives that promote and incentivize (1) energy demand management, (2) efficiency, (3) solar communities and cooperatives and clean generation at the point of use, (4) energy literacy and democracy, (5) full retail cost net metering, (6) automatic or self-executing interconnection of small-scale renewable energy via certification, and (7) utility-scale and distributed generation (DG) Renewable Energy Certificates (RECs) exchange and purchase.
 - b. Laws that provide for placing utility-scale renewable energy projects prioritizing closed landfills, brownfields, and other contaminated locations.
 - c. Laws, regulations, and policies that provide for the participation of all sectors in PREPA, PREC, or other related agency governance.
 - d. Law 82 possibly amended to specify that RPS compliance can be achieved with distributed generation located on customer premises and/or interconnected directly to the distribution system.
 - e. Laws that incentivize and protect renewable energy deployment and encourage locating renewable energy at the point of use to avoid transmission costs and losses and minimize distribution costs.
 - f. Prevent investments in existing fossil fuel facilities (e.g., conversion to natural gas) that consider the risk of lock-ins and crowding out of future, cheaper, renewable energy.
5. Identify funding mechanisms to support the transition:
 - a. Funds from the US Department of Housing and Urban Development (HUD): Require Puerto Rico Departamento de la Vivienda to allocate \$5 billion or not less than 50% of the Community Development Block Grant Disaster Recovery (CDBG-DR)¹⁸ funds to the Green Energy Fund (GEF).¹⁹
 - i. Fund tier grants for the installation of solar and battery projects.
 - ii. Fund green jobs training programs with priority for retraining PREPA workers.
 - iii. Fund resiliency and energy efficiency programs.

¹⁷ Some participants are concerned that local PV manufacturing will not be cost-effective in Puerto Rico; therefore, the scope should be evaluated to ensure it is competitive in the global energy market. In addition, some are concerned about legislating funding to a specific organization, such as the proposed REIMI. Policymakers should consider whether the development of a research lab should be competitively bid and whether it is most appropriate for research to be sponsored by public funding in this case.

¹⁸ There is a concern that the distribution of these funds may not be equitable because there are barriers that prevent access for some individuals and organizations.

¹⁹ GEF is a financial incentives program for the development of renewable energy in Puerto Rico, created under Act 83-2010.

- b. Enable Property-Assessed Clean Energy (PACE) financing through a new policy. Allow development of PACE through mortgage financing, third-party ownership or financing, loan guarantee programs, and support from the abovementioned CDBG-DR funds.
- c. Funds from the Federal Emergency Management Agency (FEMA): Prioritize FEMA funds that are allocated to PREPA or other energy-system-related purposes to renewables, storage, and distribution upgrades to enable a high penetration of grid edge resources such as solar, storage, flexible demand, and other distributed energy resources (DERs).
- d. Enable other federal funds, such as Rural Utilities Service (RUS) funding.
- e. Recover the PREPA debt burden not from electric rates but rather from a fossil fuel import tax and other non-rate-based funds.
- f. Ensure that RECs, whether contracted in Power Purchase and Operating Agreements (PPOAs) or tied to distributed renewable energy, will also be critical financing mechanisms for renewable energy deployment, whether residential or utility in scale, and will allow for RPS compliance by PREPA or its successor. RECs resulting from distributed generation should be part of the RPS.²⁰
- g. Consider a debt revolving structure, which could pass on cost savings as costs continue to decline and ensure financial sustainability of the funding mechanism.

- 6. Ensure universal energy access:
 - a. PREPA or other energy providers must provide universal service to all customers.²¹
 - b. Establish a policy that no residential customers can be disconnected from the electric system for lack of payment. Vulnerable customers should be guaranteed at least a “subsistence” level of continued energy access,²² to be defined by PREC, even if they are unable to pay.
 - c. Fund this subsistence energy guarantee through a tiered rate structure or other mechanisms as defined by PREC.
 - d. Consider time of use (TOU) rate structures in combination with the tiered rates to help balance the grid.
- 7. Change subsidies:
 - a. Adjust the residential, commercial, and industrial rates to their true cost of service, thus creating pressure to optimize system efficiency and performance. Affordable cost of energy needs to be based on efficiencies and the best use of technology and not on subsidies.
 - b. Eliminate unnecessary energy subsidies.²³
 - c. Redesign energy subsidies for nonprofits and critical facilities including any life support services to limit subsidies to the relevant equipment, either by separate metering or by a predetermined calculation for the energy usage of specific equipment.

²⁰ Some participants did not endorse the use of RECs.

²¹ Providers of last resource (POLR) are designated in many jurisdictions.

²² Some participants expressed concern about the subsistence energy guarantee—that it could incentivize nonpayment or inefficient energy use—and encouraged an alternative form of subsidy outside of the rate structure.

²³ The participants recognized the need for eliminating subsidies, but concerns were expressed in terms of subsidies to hotels and churches. Rates should be equivalent to the true cost of service. The participants also recognized the complexity of the contributions to municipalities and did not make a recommendation regarding that policy here.

2. An Independent Regulator with Enforcement Powers

KEY QUESTIONS:

- How can we ensure that there will be an independent regulator with enforcement powers for the electric energy sector in a highly politicized environment with constant legislative changes?
- How can we get PREPA to stop acting with impunity toward legislative mandates and PREC?²⁴

GOALS:

- Remove the legal impunity of PREPA and other energy service companies.
- Create investor confidence through a predictable legislative and regulatory system that allows for real-world finance and economics.
- Create a healthy prosumer energy sector.
- Align PREPA's incentives so that PREPA will benefit as the energy system becomes more distributed, clean, resilient, customer-sited, and competitive.
- Create a pathway to a public policy that benefits the people of Puerto Rico.

RECOMMENDATIONS FOR POLICYMAKERS:

1. Empower a robust PREC:
 - a. Increase the PREC budget comparable to stateside commissions to be able to afford highly qualified permanent staff (approximately \$20 million–\$30 million per year). The budget should come from a stable, predictable source to ensure regulator independence.
 - b. Grant PREC the power to preapprove all PREPA contracts above a given threshold, including those related to the privatization process. This includes adequate time for PREC to review contracts (at least 30 days).
 - c. Grant PREC the authority over incentives for staff (positive and negative) as well as criminal contempt powers (similar to the EPA) governing noncompliance by PREPA and other energy provider officials.
 - d. Consider granting PREC the authority to mandate the outsourcing of PREPA functions when PREC determines that PREPA is not complying with best practices (e.g., interconnection timeframe requirements).



PHOTO: WALMART, BAYMON, PUERTO RICO SAM'S CLUB

²⁴ Some participants indicated that the impunity attributed to PREPA is caused by unclear and sometimes contradictory policies, and partisan interference, and pointed out the need to eliminate partisan intervention and create clear public policy and laws.

- e. Incorporate a truly independent consumer advocate.
 - f. Give PREC back the powers that were taken away by Act 120.
 - g. Give PREC clear authority to issue regulations creating permit-free interconnection safe harbors under a certain kilowatt (kW) level. Remove discretion from PREPA for distributed generator interconnection requirements.
 - h. Direct PREC to consider performance incentives, including implementation of performance-based regulation (PBR) for PREPA:
 - i. Performance incentives should include energy efficiency and conservation for the full array of energy sector participants (utility, private, community, residential, and industrial).
 - ii. PREC should look to the Hawaii PBR process for shared learning experiences.
 - i. Grant PREC the power to invite stateside or international commissioners to sit in on cases, potentially via the National Association of Regulatory Utility Commissioners (NARUC).
 - j. Develop a staff training program for PREC.²⁵
2. Create strong legislative mandates ordering PREPA not to remove PREC proceedings to federal court via Title III (dilatory tactics).
 3. Ensure PREC promotes consumer choice and competition in electricity, through retail choices, the ability to create microgrids or cooperative utilities, other arrangements, or any combination thereof.
 4. Provide PREC clear authority for the enforcement of all its rules and regulations. PREC should develop new regulations to replace all the “legacy” rules that PREPA created before it was subject to a regulator. PREC should be solely responsible for the development of rules that govern private or public electricity generators, distributors, and retailers.



PHOTO: JOSHUA L. DEMOTTS

²⁵ Some participants also recommended training sessions for PREPA.

3. A Modern Regulatory Framework and Integrated Resource Plan (IRP)

KEY QUESTIONS:

- How will the regulatory framework and the IRP be flexible enough to reflect and incorporate the benefits from continued innovation? How can the regulatory framework balance future innovation with already proven technologies and regulatory structures available today?
- How can the legal system establish and ensure compliance with a policy framework and regulatory priorities while allowing PREC the flexibility to choose the appropriate tools to achieve the vision?
- How can the IRP ensure consistency with the policy goals of Puerto Rico? The following elements are required:
 - The most recent and best technology available to achieve the goals of the system.²⁶
 - The mechanisms and processes to achieve consistency.
 - Modifications and additional information to have the right evaluation tools.
 - Technology trends.
 - The consumer as prosumer.
- c. Performance metrics should cover and be aligned with the overall vision and should include:
 - i. Workforce fatalities: Number/year.
 - ii. System Average Interruption Duration Index (SAIDI)/ System Average Interruption Frequency Index (SAIFI)/ Customer Average Interruption Duration Index (CAIDI)/year.
 - iii. Decarbonization: Pounds of CO₂/year.
 - iv. RPS penetration: Percentage/year.
 - v. System utilization factor: Percentage/year (this number increases as deployment of DER increases).
 - vi. Decline in peak demand: megawatt (MW)/ year (this will level the load and contribute to a more robust system).
 - vii. Resiliency: Number of mutual aid current agreements ready to be executed.
- 2. Clarify that the utility and market participants comply with the IRP and other regulatory policies and processes.
- 3. Promote innovation by urging PREC to explore new options such as partnerships with national laboratories, an innovation fund overseen by PREC, new funding for energy efficiency, and demand response (DR) studies.

RECOMMENDATIONS FOR POLICYMAKERS:

1. Direct PREC to investigate and implement regulatory incentives (e.g., PBR²⁷) to incorporate the benefits of new technologies.²⁸
 - a. Establish a time frame for its implementation.
 - b. Ensure that the implementation time frame synchronizes with privatization efforts to provide clarity before requesting offers.²⁹
4. Direct PREC to research and report best practices for market monitoring and oversight as part of the initial IRP effort, as well as throughout the monitoring and verification of IRP implementation.
5. Ensure enforcement of PREC authority over all energy sector system management, both public or private, through incentives and penalties.

²⁶ Some participants noted that most of the solutions needed today are “off-the-shelf” and proven all over the world.

²⁷ Hawaii may serve as a case study for how to effectively deploy PBR.

²⁸ Incentives to be applied on PREPA, present and future energy utilities in Puerto Rico, and other market participants

²⁹ There was no group consensus as to whether privatization was the most appropriate path forward for PREPA.

6. Ensure that all utility types, including municipalities and cooperatives, are subject to PREC oversight. The legislature needs to evaluate and decide which of PREC's powers should apply to municipal and cooperative utilities.
7. Encourage the use of state-of-the-art resource planning methods:
 - a. Provide direction to PREC to ensure Integrated Distribution Planning (IDP) methods are included in all future planning cycles. Attributes of IDP include the following:
 - i. Consideration of DERs and other distribution assets in utility investment and planning processes in the future.
 - ii. Hosting capacity analysis.
 - iii. Locational valuation of DERs, non-wires alternatives (NWAs), and grid-connected microgrids.
 - iv. More granular analysis for load forecasts and energy efficiency (EE) and DR potential (i.e., substation-level).
 - b. Consider steps to improve the collection and use of data across the power sector by the legislature.



PHOTO: CHRISTOPHER T. TORRES

4. The Involvement of Cooperatives and Municipalities in the Transition

The municipalities and cooperatives are interested in becoming owners in the electricity system, including ownership of generation and distribution. There is a concern that the current privatization law favors the sale of assets to private companies and does not recognize the potential for locally owned community energy systems. Specifically, Act 120 dated June 20, 2018, only mentions renewable energy (specifically microgrids and mini grids) tangentially, but we believe they should occupy a much more prominent role.

GOALS:

- Democratize the process of energy generation by enabling nontraditional companies, such as energy cooperatives. Democratization includes business model and financing experimentation to leverage deployment of renewable sources, use of PPPs, and multisectoral and nontraditional governance structure approaches.³⁰
- Create the regulatory framework to incentivize this goal via participatory PPPs, multisector proposals, and business models.

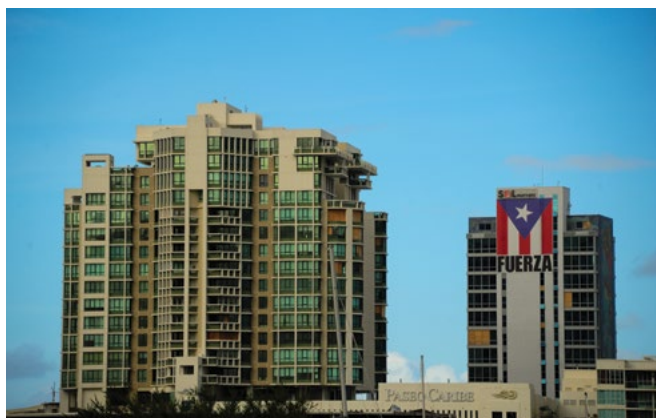


PHOTO: ANGEL XAVIER VIERA-VARGAS

RECOMMENDATIONS FOR POLICYMAKERS:

1. The legislature should approve and the Governor should sign PS 984 to authorize the creation of energy cooperatives and nonprofits. Energy cooperatives should become part of the National Rural Electric Cooperative Association to access funding and other technical resources.
2. Ensure a policy of equal treatment and remove barriers to the development of cooperative, municipal, microgrids, and other locally owned energy systems to promote reliability and democratic ownership of the electrical system.
3. Act 120 should be amended to allow the development of locally owned systems.³¹
4. PREPA should be required to lease or sell infrastructure needed by locally owned systems at a fair and reasonable rate.
5. Ensure policy includes incentivizing energy conservation to reduce the amount of investment required in new generation.
6. Pursue funding for technical assistance and project development for municipalities and cooperative projects from sources such as FEMA, HUD through the CDBG-DR program, the US Department of Agriculture, and other local sources of funds.

³⁰ As mentioned above, there is no consensus that utility privatization is the appropriate pathway forward.

³¹ Some participants expressed a preference for considering the development of such systems before PREPA proceeds with any asset sales to private companies, and such asset sales should include adequate time for evaluation and public hearings when necessary.

CONCLUSION

By structuring discussions so that all voices were heard and all concerns were incorporated into a consensus of recommendations, the Collaborative demonstrated a new model of participative democracy. The Public Collaborative was designed to produce recommendations that must be considered as part of the upcoming decisions to be made by the government of Puerto Rico, the US Congress, the private sector, community groups, business interests, and others.

Discussions were structured to incorporate the expertise, knowledge, and perspective of differing voices to form these recommendations. We hope this model of participative democracy is used in subsequent policy development activities in Puerto Rico.

Participants offer four key principles to guide such change:

1. The Promotion of a Vision for Self-Sufficiency and Credibility
2. An Independent Regulator with Enforcement Powers
3. A Modern Regulatory Framework and Integrated Resource Plan (IRP)
4. The Involvement of Cooperatives and Municipalities in the Transition

The public-minded spirit of concern for all citizens that is the basis of these principles is a reason for optimism. The leaders who participated in the Collaborative modeled a new culture and ethos. Their ability to come together for the good of all Puerto Ricans shows that a better future is achievable.



PHOTO: JOSÉ ZAYAS

APPENDIX A: GLOSSARY

Combined heat and power (CHP), sometimes known as cogeneration, is the use of a single power plant to generate both heat and electricity. In conventional power generation, large quantities of energy in the form of heat are wasted.

Community Development Block Grant (CDGB) beginning in 1974, is one of the longest-running programs of HUD and funds local community development activities such as affordable housing, anti-poverty programs, and infrastructure development.

Community resiliency hubs are locations that provide critical services for communities, particularly in the event of an emergency. These locations include hospitals, police and fire stations, community centers, and schools.

Customer Average Interruption Duration Index (CAIDI) is the average duration per power outage per customer over the course of a year, which can also be expressed as the average restoration time for a power outage.

Distributed energy resources (DERs) are a category of localized energy technologies, typically located in a customer's home or business. Types of DERs include distributed generation, battery storage, energy efficiency, and demand response.

Green Energy Fund (GEF) was created by Act 83 of 2010, the "Puerto Rico Green Energy Incentives Act," to increase green energy production and promote sustainability in Puerto Rico. This fund provided rebates covering a portion of the cost of renewable energy generation projects.

Integrated Distribution Planning (IDP) or Integrated Distributed Resource Planning (IDRP) is an updated approach to system planning for the electric distribution system that assesses the physical and

operational changes necessary for safe, reliable, affordable service that satisfies the customers' changing expectations and use of DERs and includes comprehensive planning for distribution system investments, interconnection processes, and opportunities to realize net benefits for all customers through use of DER-provided services.³²

Integrated Resources Plan (IRP) is a plan developed by electric utilities comprising a specific period of time, focused on ensuring the development of the electric power system, as well as the reliability improvement, efficiency, and transparency of the system.

Non-wires alternatives (NWAs) are energy projects that offer lower cost alternatives to building a new electric grid infrastructure (e.g., wires, transformers, and substations). NWA projects may use resources such as distributed generation, energy efficiency, demand response, battery storage, or other DERs to manage energy consumption locally rather than constructing or upgrading physical infrastructure.

Performance-based regulation (PBR) describes a set of regulatory tools used to align a utility's motivation and profit incentives with the interests of customers and society. This can include incentives (or penalties) based on performance against predetermined metrics, revenue decoupling, multiyear rate plans, and other mechanisms typically instituted by an energy regulator.

Power Purchase and Operating Agreement (PPOA) refers to contracts that a utility has established or may establish in the future with third-party power providers to operate power plants and sell their energy.

³² Schwartz, Lisa, "Overview of Integrated Distribution Planning Concepts and State Activity," March 13, 2018, http://eta-publications.lbl.gov/sites/default/files/schwartz_madri_dsp_presentation_20180313_fin.pdf

Property-Assessed Clean Energy (PACE) is a mechanism that can provide financing for energy efficiency and renewable energy improvements on private property, whether residential or commercial. PACE financing costs are paid back over time through an assessment on the facility's property taxes.

Prosumer is a producer and consumer of energy in residential, commercial, and industrial customer classes. A prosumer is an active participant in the market, in comparison with the traditional customer who consumes energy but does not produce it or provide services to the electric grid.

Public-private partnerships (PPPs), also called P3s, are contractual arrangements between private sector and government entities. In Puerto Rico, the Puerto Rico Public-Private Partnerships Authority oversees such contracts. A P3 structure, as a vehicle for the privatization of PREPA generation assets and the establishment of a concession for its transmission and distribution (T&D), was established in Act 120-2018.

The Puerto Rico Electric Power Authority (PREPA) founded in 1941, is the sole provider of electricity to customers in Puerto Rico. PREPA is a government-owned corporation of Puerto Rico and is one of the largest public utilities in the United States.

The Puerto Rico Energy Commission (PREC) is the government agency that regulates the energy industry in Puerto Rico. It was established by Act 57 of 2014. PREC has the responsibility to regulate, monitor, and enforce the energy public policy of the Commonwealth of Puerto Rico. After the enactment of Act 211 on August 12, 2018 the Puerto Rico Energy Bureau (PREB) was created. Per Act 211 the PREB has similar regulatory powers to its predecessor and replaces the Puerto Rico Energy Commission.

Renewable Energy Certificates (RECs) are proof that energy has been generated from renewable sources such as solar or wind power. Each REC represents the environmental benefits of 1 megawatt-hour (MWh)

of renewable energy generation. RECs are tradable, nontangible energy commodities in the United States that represent proof that 1 MWh of electricity was generated from renewable sources.

Renewable Energy Innovation and Manufacturing Institute (REIMI) is an initiative proposed in this report, intended for research and development, among other functions, on solar and renewable sources.

Renewable Portfolio Standard (RPS) it refers to the requirements of the production of energy from renewable energy sources, through laws and regulation. In Puerto Rico, it was established by Act 82-2010.

Rural Utilities Service (RUS) is an agency of the US Department of Agriculture that administers programs that provide infrastructure or infrastructure improvements to rural communities, including electric power services.

System Average Interruption Duration Index (SAIDI) is the average total power outage duration for each customer served over the course of a year.

System Average Interruption Frequency Index (SAIFI) is the average number of power outages a customer experiences per year.

APPENDIX B: PUBLIC COLLABORATIVE FACULTY AND PRESENTATIONS

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PRESENTATIONS

- *Introduction to Utility Regulation: The Regulatory Contract*
- *Some Fundamental Concepts of the Energy Regulatory Framework*
- *Socioeconomic Indicators*
- *Introduction to Electricity System Planning*
- *Ownership Structure, Contracting Process, and Wholesale Markets*

INTRODUCTION TO UTILITY REGULATION: THE REGULATORY CONTRACT

Introduction to Utility Regulation: The Regulatory Contract

Karl McDermott

University of Illinois Springfield

Agustin J. Ros

Principal the Brattle Group and Adjunct Professor Brandeis University

**Faculty Session before the Public Collaborative
San Juan Puerto Rico, July 19, 2018**

Overview

- Concept of the public utility
- The regulatory contract
- Supreme Court precedent
- Implementing the bargain – regulatory methods
 - Cost of service
 - Cost of equity capital
 - Rate case process
- Conclusions

What is a Public Utility?

- A Public Service Entity represents an organizational choice by Society
- It can be Private, Public, Cooperative or NGO in form
- It is charged with developing and managing critical infrastructure
- These are essential facilities providing essential services
- Because these services are most often efficiently supplied by a single firm, this monopoly condition results in regulation of the entity
- Society appoints an Agent-the utility regulatory commission- to oversee or regulate the Regulatory Contract between society and the public service entity

Regulation Represents a Long-term Relation Between Customer and Utility

- Government and Courts recognized that when the state does not provide the service a contract is necessary to induce private supply for the public good.
- As with any contract regulation makes certain assumptions and allocates risks (i.e. who pays for what)
- In long-term assumptions may not hold and contract must be adjusted
- Commission-based regulation evolved as an administrative adaptation process in a relational contract (Goldberg)

4

Regulation Represents a Long-term Relation Between Customer and Utility

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- In long-term assumptions may not hold and contract must be adjusted
- Commission-based regulation evolved as an administrative adaptation process in a relational contract (Goldberg)

4

Regulatory Contract

- Traditional Regulation was structured to ensure this function was performed efficiently
- The risk allocation embodied in the calculation of total revenues allocated risk to the consumer
 - Recover actual cost
 - Recover revenues from growth
- Contract spells out terms and conditions for service
- Enables investment through commitment
- Establishes mutual rights and obligations (responsibilities)
- Allocates risk
 - Establishes cost based compensation

6

Relational Contract Framework

- Relational contract is based on trust between parties based on a general outline, but implicit terms govern behavior
- Focus of the commission in managing the “implicit terms”
 - Determining an actual cost based price
 - Provide reasonable incentives for efficiency
 - Provide customers with adequate, reliable and efficient service

7

Modern Contract Framework

- Hope [Federal Power Comm'n. v. Hope Natural Gas Co., 320 U.S. 591 (1944)] establishes modern framework and emphasizes flexibility to balance contract
- Hope Codified the traditional balancing of interests
- End result (balance), not the model that mattered
- Commission regulation is put front and center it is your job to manage the terms and conditions
- [T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.

8

Supreme Court Rulings on Cost of Capital

- The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. (*Bluefield Water Works & Improvement Company vs. Public Service Commission of West Virginia, 1923*)
- [T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. (*Federal Power Commission vs. Hope Natural Gas Company, 1944*)

9

The Customers Count as well

- In *Covington and Lexington Turnpike Road Co. v. Sanford*, 164 U.S. 578 (1896), the Supreme Court recognized:
[S]tockholders are not the only persons whose rights or interests are to be considered. The rights of the public are not to be ignored . . . The public cannot properly be subjected to unreasonable rates in order simply that stockholders may earn dividends.
Covington, 164 U.S. at 594.
- In *Federal Power Commission v. Natural Gas Pipeline Company of America*, 315 U.S. 575, 62 S. Ct. 736 (1942) reemphasized this point:
The consumer interest cannot be disregarded in determining what is a just and reasonable rate. Conceivably, a return to the company of the cost of service might not be just and reasonable to the public.
Id., S. Ct. at 753 (Black, Concurring).

10

Establishing the Regulatory Framework

- Regulators evaluate and review all costs
- Regulators can review all decisions
- Regulators established a forward looking set of standards to establish just and reasonable rates
- Standard presumes efficient and economical management

Karl A. McDermott

11

What is the Puerto Rico History

- Integrated Resource Plan (IRP) case July 2015- Sept. 2016
- Stranded Cost (Petition for Approval of Transition Order) Case April - June 2016
- Rate Case 2016 - 2017
- Appeal to Court
 - Stranded Cost appealed on court
 - Rate Case still before the court

Implementing the Regulatory Bargain

- Traditional Regulation was structured to ensure this function was performed efficiently
- The risk allocation embodied in the calculation of total revenues allocated risk to the consumer
 - Recover actual cost, inclusive of your opportunity cost of capital
 - Recover revenues from growth, just as competitive firm do

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Regulatory Method

- Cost of Service Regulation (COSR)
- Assumptions
 - Costs are stable
 - Monopoly services
 - Growth
 - ROE reflects risks under this set of assumptions

14

Traditional Test Year Ratemaking

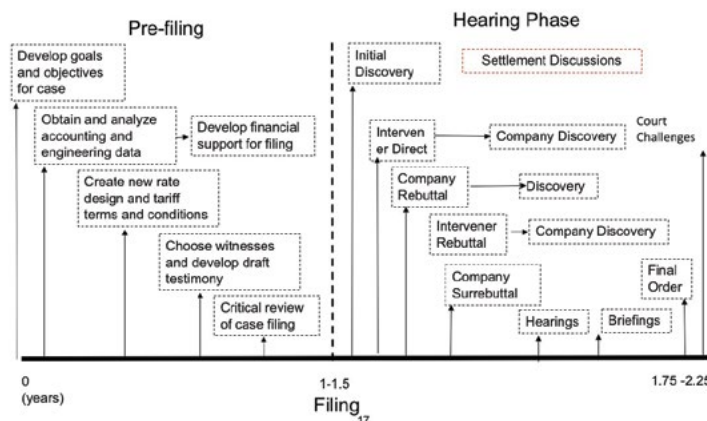
- Assumptions
 - Stable categories of cost and demand
 - Normalized Test Year Model
 - No single issue ratemaking
 - No retroactive ratemaking
 - Selected test year representative of the future for cost based rates
 - Errors in test year versus actual are offsetting
 - Things balance out over time

Cost of Equity Capital

- The cost of Equity capital can be defined as follows:
 - The cost of capital is the **expected** rate of return in capital markets on alternative investments of equivalent risk
- Fair return
 - Compensates investors for risks taken
 - Allows utility to maintain financial integrity
 - Maintains the ability to attract capital in the future (i.e., maintains the creditworthiness of utility)
- Fair return is related to the “opportunity cost” of capital
 - Investors supplying capital to the utility thereby forgoing consumption or the return from an alternative investment in addition to taking on the risk associated with the utility's cash flow. A fair return must be sufficient to compensate for the opportunity cost or investors will not supply capital to the utility.

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Timeline for rate case filing



Key Points-Conclusions

- State gets an Essential Service at reasonable cost
- Regulation and Regulatory contract are essential to Attract Capital
- The Regulatory Contract is mechanism to address risk issues in order to obtain lower cost capital.
- Regulation must balance the interests of consumers and stockholders

18

Reference Slides

- Legal citation
- Other Background Material

19

Binghamton Bridge Case in 1865

- The ... [capital needed is] beyond the ability of individual enterprise, and can only be accomplished through the aid of associated wealth. This will not be risked unless privileges are given and securities furnished in an act of incorporation. The wants of the public are often so imperative that a duty is imposed on the Government to provide for them; and, as experience has proved that a State should not directly attempt to do this, it is necessary to confer on others the faculty of doing what the sovereign power is unwilling to undertake. The legislature, therefore, says to public-spirited citizens: "If you will embark, with your time, money, and skill, in an enterprise which will accommodate the public necessities, we will grant to you, for a limited time period or in perpetuity, privileges that will justify the expenditure of your money, and the employment of your time and skill." **Such a grant is a contract, with mutual consideration**, and justice and good policy alike require that the protection of the law should be assured to it.
(emphasis added)

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Brandies/Holmes SW Bell 43, Sup. Ct. Rep. 544, 547 (1923)

- The investor agrees, by embarking capital in a utility, that its charges to the public shall be reasonable. His company is a substitute for the state in the performance of the public service; becoming a public servant. The compensation which the constitution guarantees an opportunity to earn a reasonable cost of conducting the business.

Karl A. McDermott

21

SOME FUNDAMENTAL CONCEPTS OF THE ENERGY REGULATORY FRAMEWORK



Some Fundamental Concepts of the Energy Regulatory Framework


Public Collaborative for Puerto Rico's
Energy Transformation

Carlos J. Fernández Lugo
McConnell Valdés LLC
July 19, 2018

English Translation

This document represents the translation to English from the Some Fundamental Concepts of the Energy Regulatory Framework presentation, done in July 19, 2018 during the ICSE- RMI: Public Collaborative for Puerto Rico's Energy Transformation. In case of discrepancy between the Spanish and English documents, the original work done in Spanish prevails.


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Looming Changes – Act 120-2018

- Act 120-2018: The Puerto Rico Electric System Transformation Act
 - Authorizes PREPA and the Government of Puerto Rico to establish P3s [Public Private Partnerships] or execute Sales Contracts for PREPA assets Sec 5(a).
 - The Public Private Partnerships Authority [P3A]: the only body empowered to determine (i) Functions, Services and Facilities that will be the subject to P3s; and (ii) determine which Assets will be sold or transferred. Sec 5(b).
 - For the sale of assets, separate requests for proposals will be required. Sec 5(e).
 - The Partnerships Committee (designated by the P3A) will evaluate and select the proposals. Se 5(e).

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Looming Changes – Act 120-2018

- Every contract will contain a full compliance with the energy public policy and regulatory clause regarding its framework, *except those provisions that are excluded by the Act or are expressly sanctioned by the Legislative Assembly.* Se 5(f)
- Every contract requires a Certificate of Energy Compliance. Se 5(g):
 - The PREC must evaluate the report of the Partnerships Committee and contract to determine whether it complies with the energy public policy and regulatory framework.
 - The PREC has 15 business days to issue a Certificate or resolution denying its issuance.
 - If not issued, it will be deemed to have received the Certificate.
 - Certificates are subject to judicial review by the Courts of Appeals.

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Looming Changes – Act 120-2018



- Act 120-2018 excludes transactions from certain requirements of the P3 Act, Act 29-2009, including a desirability and convenience study; absence of power to transfer title; limitation as far as the term of the contract (50 years); etc. Se 6(a).
- Contracts may provide exemptions to certain related statutory or regulatory provisions that the Partnership Committee deems reasonable to ensure the viability of the transaction, including Section 6B of Act 83-1941. Se 6(d).
 - Ex. Subsection (h) of Section 6B provides for the preparation of an IRP [Integrated Resource Plan], among other things.
- The PREC will "assist" the P3A in overseeing the compliance of the contracting party under the P3 or sales contract. Sect. 8(d).
 - The PREC may not alter or amend the contract, or interfere in *operational or contractual matters**,

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Looming Changes – Act 120-2018



- The Contractor will be entitled to collect fees, revenue, rates and any other type of charges. Sec. 8(f).
 - In accordance with what is provided in the contract
 - The PREC retains jurisdiction to review and approve any modification
 - The Contractor and PREPA must comply with the requirements of Act 57-2014 for the modification of rates.
 - The Contractor will be considered a Certified Energy Company. Se 8(e).
- The Contractor awarded a P3 for the operation of the electric grid may not be a contractor for generating facilities for PREPA. Sec. 8(g).
- The sale or assignment of all of the generation assets of the PREPA to a single contractor is prohibited. Sec. 8(h).

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Looming Changes – Act 120-2018



- Every contract will be "subject to the energy public policy and the regulatory framework." Sect. 9.
 - Work Group (designated by consensus between the Governor and the Presidents of Legislative Bodies) will recommend such public policy and regulatory framework.
 - Must be approved by the Legislative Assembly no more than 180 days from the date of Act 120-2018 (December 17, 2018).
- The contracts are subject to ratification by both legislative bodies within a term of 45 days. Sec. 10. If a Concurrent Resolution is not issued approving or denying, the transaction is deemed approved.

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Existing Regulatory Framework - Concepts



■ Act 57-2014

- Creates the State Office of Energy Public Policy [Spanish acronym – OEPPE]: to promote public policy; spokespersons and advisor to the Governor, agencies and instrumentalities; recommendations to the PREC; liaison with the USDOE, FERC, etc.; conservation plans; energy efficiency requirements; etc. Art. 3.4, 9 LPRA § 1052.
- Creates the Independent Office of Consumer Protection [Spanish acronym – OIPC]; education and information to customers about rights and responsibilities; advocate and spokesperson for the customers' interests as per the PREC; participation in the process of adopting rates; etc. Art. 6.43, 9 LPRA § 1054qq.
- Creates the Energy Administration: administrative and operational support for the PREC, OEPPE and OIPC. Art. 6.2, 9 LPRA § 1054.
- Creates the Puerto Rico Energy Commission.

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Existing Regulatory Framework – Concepts



- PREC: the independent regulatory body in charge of regulating, supervising, monitoring and ensuring compliance with the energy public policy. Art. 6.1.
 - Now composed of four (4) associate commissioners and one (1) President, appointed by the Governor with the advice and consent of the Senate. Compensation equivalent to that of an Appellate Judge. Sect. 13, Act 120-2018.
 - It is not clear whether the PREC will go on to be the NEPR: See PC 1408, Reorganization Plan of the Puerto Rico Public Services Regulatory Board, approved in the Conference Commission of June 30, 2018. It does not appear that it has complied with the requirements for approval for reorganization plans pursuant to Act 122-2017.

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Existing Regulatory Framework – Concepts



- PREC: Powers and duties. Art. 6.3, 9 LPRA § 1054b
 - It will regulate electric services companies.
 - It will regulate to ensure the capacity, reliability, safety, efficiency and reasonability of rates.
 - It will monitor the quality and reliability of electric services.
 - It will regulate the wheeling of energy.
 - It will address cases and disputes about governmental compliance with conservation policies and energy efficiency.
 - It will approve the rates and fees that are charged by the electric services companies.
 - It will ensure that the rates guarantee payment of the debt.
 - It will monitor compliance with the Renewable Energy Portfolio.

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Existing Regulatory Framework – Concepts



- **PREC: Powers and duties. Art. 6.3, 9 LPRA § 1054b**
 - It will review and approve PREPA interconnection requirements for distributed generators and will monitor its compliance.
 - It will establish reliability standards for the electric grid.
 - It will review and approve the reserve margin established by PREPA and will ensure it is complied with.
 - It will review final decisions by PREPA with respect to complaints for requests for investigation by its customers.
 - It will make determinations about renewable energy interconnection, both distributed and grid scale, in collaboration with the OEPPE and PREPA.
 - It will establish the regulatory framework for solar and microgrid communities.

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Existing Regulatory Framework – Concepts



- **Integrated Resource Plan or IRP: Describes the combination of resources for the supply of power and conservation that satisfies, in the short-, medium- or long-term, the current and future needs of the power system and that of its customers at the *lowest reasonable cost*. Art. 6.23, 9 LPRA § 1054v.**
 - The PREC will review and approve the IRPs in collaboration with the OEPPE and the OIPC, and taking into consideration the comments from the interested parties. Public process.
 - Twenty-year planning horizon
 - The PREC will monitor compliance with the IRPs.
 - Review process every 3 years

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Existing Regulatory Framework – Concepts



- **IRP: Act 83-1942, Sect. 6B(h), 22 LPRA § 196b.**
 - If there is a substantial change before three years, it must be revised. Ex. Hurricane María.
 - All amendments must be presented to the PREC.
 - It must include forecasts of future demand, conservation resources; generation technologies; transmission capacity; combination of resources to promote the diversification of sources and stabilize costs; interconnection of renewable energy projects to comply with Act 82-2010; etc.
 - The IRP cannot be altered by any Governing Board without first conducting a review process before the Commission.
 - The Certified Fiscal Plan from the PREPA establishes that an updated IRP will be presented by the end of September of 2018. Certified Fiscal Plan, pg. 88.

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Existing Regulatory Framework – Concepts



- **Review of Energy Rates:** The PREC is in charge of reviewing and approving the proposals from PREPA for usage or consumption rates and for use of the grid. Art. 6.25, 9 LPRA § 1054x.
 - The PREC must ensure that all the rates are fair and reasonable; consistent with correct fiscal and operational practices that provide reliable service, at the lowest reasonable cost.
 - During the review process, PREPA or the requesting Certified Company (see Sec. 8(e) of Act 120-2018) has the burden of proof to show that it is complying with the previous criteria.

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Existing Regulatory Framework – Concepts



- **Review of Energy Rates:** PREPA or the Certified Company must submit information about:
 - Direct and indirect costs of generation, transmission and distribution, including marginal costs, "stranded costs", and for loss of energy; repayment of the debt; energy conservation and efficient use; the effects of special laws, subsidies and contributions; etc.
- The approved rate must follow the "transparent invoice" format.
- It must be sufficient to cover payment of the PREPA bonds' principal and interest; reasonable PREPA costs; cost of the contribution in lieu of taxes and other contributions and subsidies; etc.
- It will remain in force for 3 years, unless the PREC begins a review process.

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Existing Regulatory Framework – Concepts



- **Contracts between PREPA and another other electrical service company, Art. 6.32, 9 LPRA § 1054ff:** The PREC will evaluate and approve all contracts including those of independent energy producers (that is: PPAs), before being granted.
 - Contracts inconsistent with the IRP will not be approved.
 - The rates must be fair and reasonable and protect the public treasury.

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Existing Regulatory Framework– Concepts



- Construction or expansion of facilities of certified energy companies, Art. 6.34, 9 LPRA § 1054hh:
 - Construction or expansion requires filing a notice of intent with the PREC, which must determine whether the proposal complies with the objectives previously established by the IRP.
 - The PREC must issue a determination as to whether the project is necessary, proper and consistent with public interest.
- Transfers, acquisitions, mergers and consolidations of certified energy companies, Art. 6.35, 9 LPRA § 1054ii: Transactions between companies or involving their facilities will not be completed without the PREC certifying that they comply with the IRP, with the best interests for Puerto Rico, and do not entail the creation of a monopoly, among others.

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Existing Regulatory Framework – Concepts



- Renewable Energy Portfolio: Establishes the mandatory percentage of sustainable renewable energy or alternative renewable energy (collectively green energy) with which each "retail energy provider" must comply. Act 82-2010. 12 LPRA § 8124.
 - 2015-2019: 12%; 2020-2027: 15%; 2028-2034: Plan; 2035: 20%
 - Retail energy provider: PREPA and any other retail energy provider who sold more than 50,000 MWh during the previous calendar year. 12 LPRA § 8121(28).
 - The compulsory amount is obtained by multiplying the indicated % by the total energy sold by the provider in the same calendar year.

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Existing Regulatory Framework – Concepts



- Renewable Energy Certificate or REC: personal property that is a measurable economic asset, which represents the equivalent 1 MWh of electricity generated by a green energy sources, issued and recorded pursuant to Act 12 LPRA § 8121(8).
- A retail energy provider may comply by filing with the PREC either of the following or a combination of both, 12 LPRA § 8132:
 - A REC issued and recorded in its name for each MWh that may be necessary to cover the corresponding percentage.
 - When distributed renewable energy is accounted for by a net metering program and it is not viable to obtain RCEs, through a *report*.

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Existing Regulatory Framework – Concepts



- As an alternative to the filing of RECs, a retail energy provider may file a report in which it shows its compliance by purchasing green energy from distributed energy producers together with the environmental and social attributes. 12 LPRA § 8132(e).
 - The report is subject to the review and approval of the PREC.
 - It must show that it is not feasible to require that the energy be individually recorded and accounted for in the renewables registry.
 - The report must comply with the other requirements that certify the information on which it is based (that is, name and address of the producer; amount of energy acquired; certification; etc.).

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Existing Regulatory Framework – Concepts



- According to a PREPA report filed with the PREC in January of 2018, PREPA had approximately 273 MW of renewable energy projects at grid scale in operation before Hurricane María.
- The PREPA Certified Fiscal Plan proposes an increase in renewable energy integration of close to 9 times the current level by the year 2023: 300 MW of storage, 1,600 MW of solar energy and more than 700 MW of wind energy. Fiscal Plan, page 82.
 - Participation of 31%, according to the Certified Fiscal Plan.

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SOCIOECONOMIC INDICATORS

Public Collaborative for Puerto Rico's Energy Transformation

July 19th - 20th, San Juan, Puerto Rico

Socioeconomic Indicators

Ramón J. Cao García, Ph.D.

English Translation

This document represents the translation to English from the Socioeconomic Indicators presentation, done in July 19, 2016 during the ICSE-RMI Public Collaborative for Puerto Rico's Energy Transformation. In case of discrepancy between the Spanish and English documents, the original work done in Spanish prevails.

Population

Characteristics: Year 2016	USA	PR
Average Age (years)	37.7	39.4
Population 62 years of age or older (%)	17.9%	21.0%
Families under the poverty line (%)	11.0%	45.1%
Home ownership (%)	63.6%	68.6%
Unoccupied dwellings (%)	12.2%	21.3%
Households without a motor vehicle (%)	9.0%	16.8%
Persons [25 years or older] with a Bachelor's degree or higher	30.3%	24.6%

Source: 2012-2016 American Community Survey 5-Year Estimates

Comments about the population

- Aging of the population:
 - Low birth rate
 - Emigration
- Poverty level
 - More than 4 times greater than that of the U.S.
 - Poverty level: 1 person <\$12K; family of 4: <\$25K ... Working poor

Comments about the population

- Housing
 - Homeownership: 72.4% in 2010, 68.6% in 2016
 - Housing expenses \geq 35% of income: 36.6%
 - Renting expenses \geq 35% of income: 47.2%
- Education: Persons 25 years of age or older with a Bachelor's degree or higher - lower than in the U.S.

Work

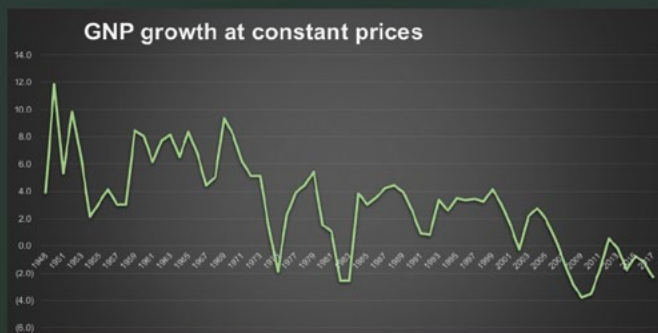
Characteristics: Year2016	U.S.A.	PR
Labor participation rate	63.5%	36.8%
Unemployment rate	7.4%	11.8%
Employment/Population rate	58.4%	17.7%
Median salary	\$31,334	\$16,937
Median salary of persons who worked all year full time	\$60,920	\$22,948

Source: 2012-2016 American Community Survey 5-Year Estimates

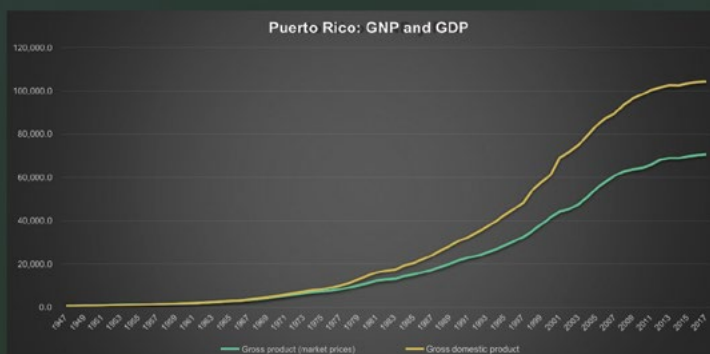
Comments about work

- Lowest labor participation in the hemisphere
- Only 17.7% of the population is employed.
- Median salary is lower than the poverty line for a family of 4 or 5 people
- Median salary in PR = 54.1% of that in the U.S.
- Median salary in PR for people working full time all year = 37.7% of the corresponding figure in the U.S.

GNP growth at constant prices



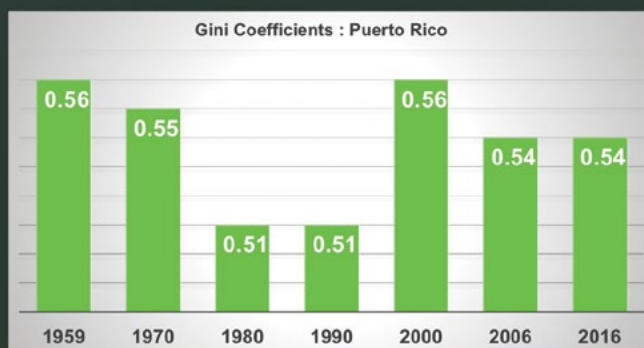
Gap between the GDP and GNP



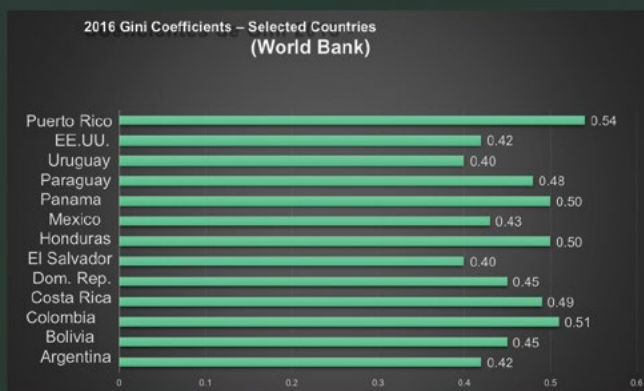
Comments about the performance of the economy

- Puerto Rico is an insular economy
- Until 1973 there was success in economic growth; after that the development strategy becomes obsolete. We didn't want to find out.
- Growing gap between the GDP and GNP
 - GDP: Value of all production during one year.
 - GNP: Value of all production during one year, that is available for use by the residents
 - GDP/GNP in 1947= \$0.93; in 2016= \$1.48

Equity: Gini Coefficients for Puerto Rico



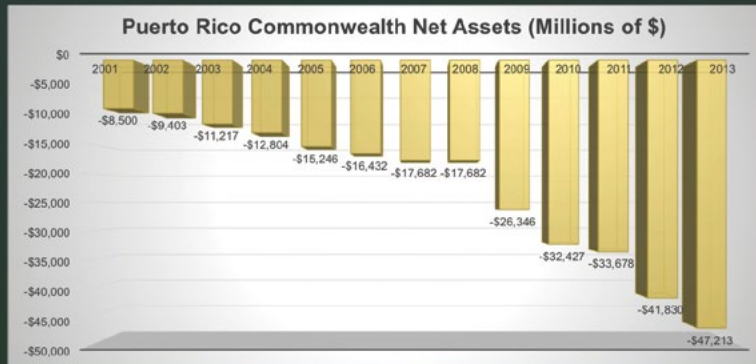
Equity – Gini Coefficients



Comments about social equity

- Equity and poverty are two different concepts
- Gini Coefficient: Developed by Corrado Gini
- 0 = perfect equity; 1 = perfect inequality
- Between 1959 and 2016 the Gini coefficient fluctuates between 0.56 and 0.51, without an apparent pattern. [Contrary to Kuznets's hypothesis]
- Puerto Rico is the country in this hemisphere with the greatest level of social inequality.

Fiscal Crisis



Comments about the fiscal crisis

- The fiscal crisis did not begin in 2015. Government's operational deficits began around 1970.
- Peculiar definition of the "balanced budget" ordered by the Constitution.
- The government shutdown in May of 2006.

INTRODUCTION TO ELECTRICITY SYSTEM PLANNING

Introduction to Electricity System Planning

Agustin J. Ros

Principal the Brattle Group and Adjunct Professor Brandeis University

Karl McDermott

University of Illinois Springfield

**Faculty Session before the Public Collaborative
San Juan Puerto Rico, July 19, 2018**

Topics

- Fundamentals of Integrated Resource Planning (IRP) and implications
- Comparative Costs of Electricity Generation Technology
- IRP and Implications of Renewable Portfolio Standards
- Role of Distributed Energy Resources, Demand Response and Energy Efficiency

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What is an Integrated Resource Plan (IRP)?

Integrated Resource Planning (IRP) takes many different forms across different jurisdictions

- The process through which regulated utilities plan for meeting forecasted annual peak and energy demand **at least possible cost**, propose solutions to regulators, and obtain approval for investments through public stakeholder processes. It is the result of a systematic analysis of how to provide reliable power at least cost

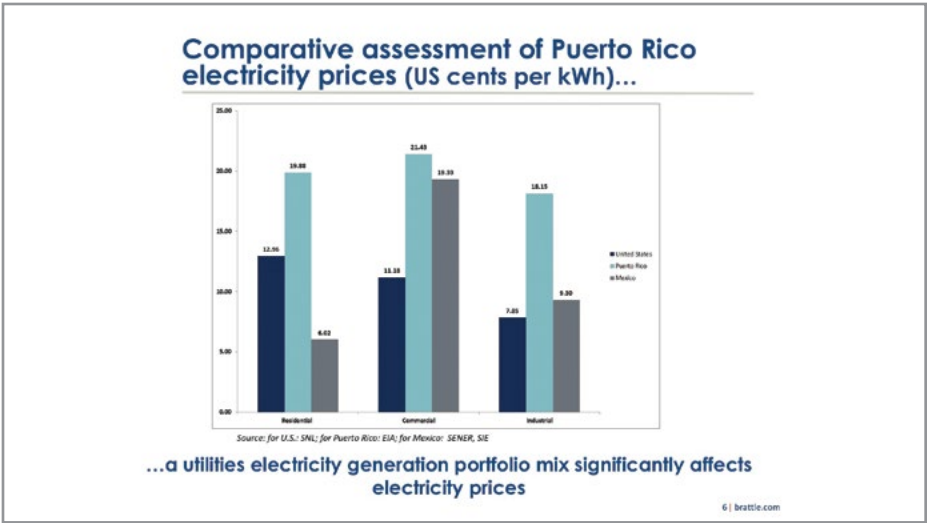
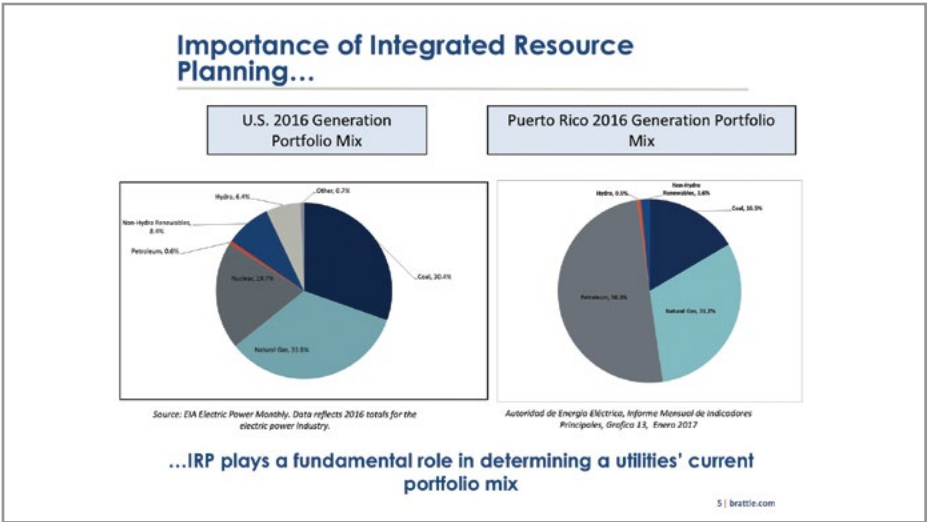
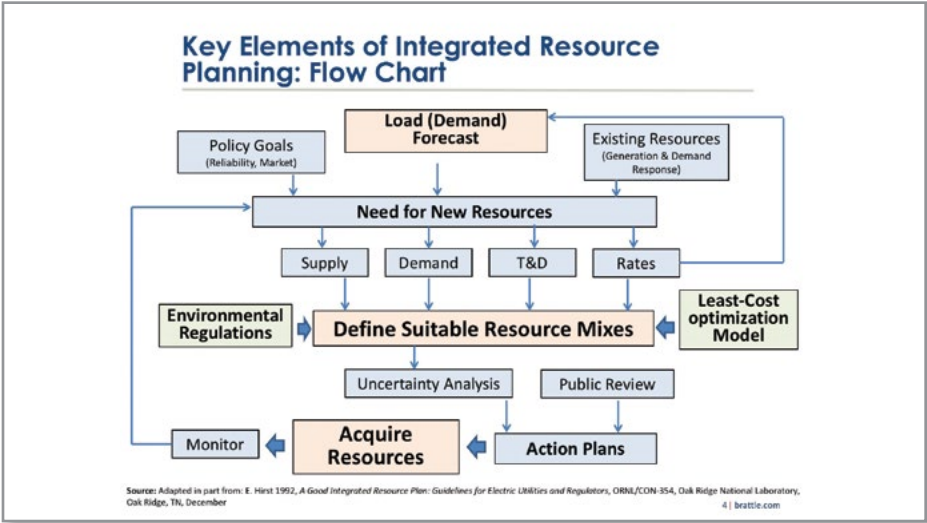
Puerto Rico Act 57-2014 § 1.3(ee)

- A plan that considers all reasonable resources to satisfy the demand for electric power during a specific period of time, including those related to the offering of electric power, whether existing, traditional, or new resources, and those related to energy demand, such as energy conservation and efficiency, or demand response and localized energy generation by the customer

Puerto Rico Energy Commission, Case No.: CEPR-AP-2015-002, ¶ 30

- For Puerto Rico, the goal, in short, is to replace old, costly plants with lower-cost options: more efficient plants, renewable resources, energy efficiency, demand response and distributed generation technologies—some of which empower consumers to manage their own costs, all of which reduce environmental damage as well as customers' exposure to fuel price volatility.

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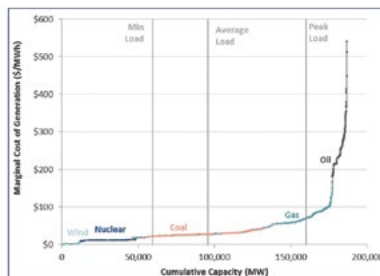


IRP ranks and selects least-cost technology options until forecasted peak demand is met

Important drivers of energy prices:

- Fuel prices, with gas price being by far the biggest driver in the US
 - Marginal costs of renewables are low
- Emissions prices, including CO₂ and conventional pollutants
- Changing supply mix (especially increasing renewables penetration)
- Reserve margin

PJM 2017 Supply Curve (winter)

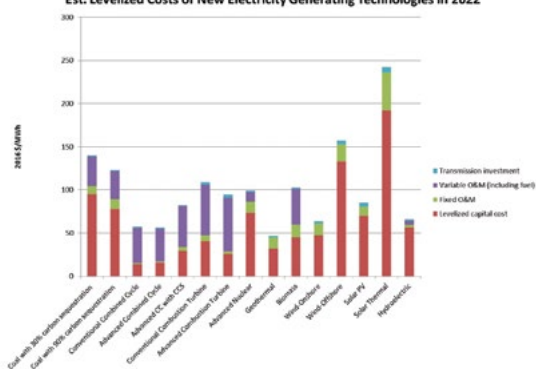


Notes: Average Gas Price is \$2.78/mmbtu. Average Oil Price is \$20.83/mmbtu. Marginal cost is the sum of Fuel, Variable O&M, and Emissions cost for each unit (pulled from Ventyx Generating Assets Capacity Auctions). Summer cumulative capacity is represented for both seasons. For gas plants, flat price is the average summer and winter price. For wind, the average price is used. Summer and winter peak load is based on the average peak load for the region for 2017. The Ventyx Generating Assets Capacity Auctions for 2017, Michigan, Average, and Peak Load are shown for 2017. In Summer and Winter curves the WGS01 CO2 price in the March 2015 auction has been considered. Wind and solar installed capacity derated by capacity credit levels. Retirements and new-builds that are currently under construction are accounted for. Oil price is inflated from current prices to 2017 prices.

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Comparing *Total* Costs Across Technologies

Est. Levelized Costs of New Electricity Generating Technologies in 2022



Note: LCOE values should only be considered a first pass screening metric since it

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Complicating Factors

Policy and technology uncertainty

- Carbon constraints
- Natural gas prices and lack of natural gas infrastructure
- Renewable costs and policies
- Future load projections and role of energy efficiency
- Completion of nuclear and CCS plants

Transmission and other operational complicating factors are very important!

- Transmission constraints
- Ramping constraints
- Start-up costs and minimum run times
- Distributed generation

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Resource Procurements by Regulated Utilities

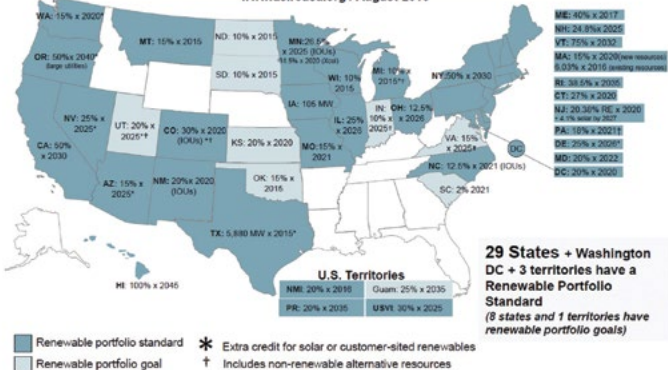
Regulated utilities have for several decades accommodated state and federal policies in a least-cost framework for resource procurements

- A least-cost approach to resource procurement seeks to minimize total system costs over the entire planning period, but government policies can mandate resource procurements that are not necessarily least-cost
 - Renewable portfolio standards (RPS) are state policies that require utilities to source a minimum percentage of sales from renewable generation
 - The Public Utility Regulatory Policies Act (PURPA) is a federal statute passed in 1978 that obligates a utility to purchase power from certain “qualifying facilities” at avoided cost
- Renewables have historically been more expensive than conventional power sources like coal, but significantly improved economics have led utilities’ procurements of renewables even if regulatory RPS requirements were fulfilled long ago (current surge in renewable procurements is a result of significantly better economics of renewables over alternatives)

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Renewable Portfolio Standards

www.dsireusa.org / August 2016



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Distributed Energy Resources (DERs) become Increasingly Important in IRP...

By Distributed Energy Resources (DERs) we mean resources that are located on the distribution system:

- PV
- Wind
- Micro turbine
- Small hydro or other renewable generators
- Storage
- Microgrids
- Energy Efficiency (EE) and Demand Response (DR)

...DERs needs to be taken into account in the IRP demand forecast and DERs can also be incorporated into IRP as a least-cost demand response option to meet forecasted load

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Features of DERs

The unique feature of DERs is their location on the distribution system, which allows them to:

- Reduce or delay distribution or transmission investment.
- Manage distribution-level voltages.
- Reduce wear and tear on transformers by reducing the number of tap changes.

If strategically located, DERs can have significant value. There are only a few examples, which are described later in this presentation:

- Brooklyn Queens Demand Management Demand Response Program
- Puget Sound's Bainbridge Island project
- Field, BC project
- Oncor battery storage
- PG&E Angel Island
- PG&E Chico
- PG&E Huron

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OWNERSHIP STRUCTURE, CONTRACTING PROCESS, AND WHOLESALE MARKETS

Ownership Structure, Contracting Process and Wholesale Markets

Karl McDermott

University of Illinois Springfield

Agustin J. Ros

Principal the Brattle Group and Adjunct Professor Brandeis University

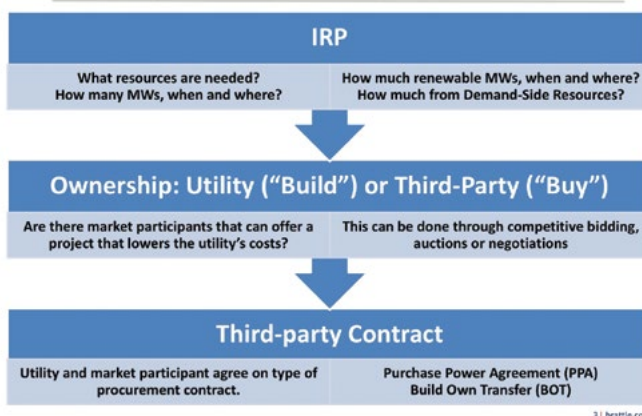
Faculty Session before the Public Collaborative
San Juan Puerto Rico, July 19, 2018

Topics

- Basics of IRP, ownership structure and contracting
- Regulation of energy and capacity procurement
- Third party provider and contracting process
- Transmission access and wholesale markets

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Should the utility “Build or Buy”? Such decisions are a component of the IRP process



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Avoided costs: Key to answering the “build or buy” question?

Key concept: the utility’s avoided costs

- The costs a utility avoids when purchasing energy from a third-party
- Calculate the utility’s cost of electricity over every hour of the year. For any third-party resource compare its costs to the utility’s costs that is avoided if the third-party energy is purchased
- Significant debate about exact calculation of a utility’s avoided costs

Avoided cost determines the “build or buy” decision

- Avoided cost is what the utility should be willing to pay to purchase an energy resource
- Any resource cost at or below a utility’s avoided cost is a cost-effective decision on the part of the utility and worth acquiring

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Regulation of Energy Procurement

- Regulator Establishes rules for bidding and purchasing power
- Regulator may appoint a third party to evaluate bids received by utility
- Regulator approves the final contract price and any adjustment over time

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Contracting for energy supply

- Competitive bidding
 - In the present scenario, PREPA as a single buyer, conducts RFP or competitive bid for capacity and energy
 - Specific needs: load following, base load, peaking, black start
 - Contracts can be for long-term, intermediate or short terms
- Question of incentives to build
 - Term of contract is part of the incentive as well as price
- Chicken and egg problem
 - To have competitive markets you need to have existing sellers
 - To have existing sellers you need to have induced them to build
 - To induce them to build they need long term contract
 - If long term contracts offered first into market capture market

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Purchase Power Agreements (PPA)

- PPA is a contract between two parties
 - Seller generates electricity
 - Buyer ("off-taker") purchases the electricity
- PPA defines all of the commercial terms
 - Date of commencement of commercial operation
 - Schedule for delivery of electricity
 - Penalties for under delivery
 - Payment terms
 - Termination
 - Transmission risks
- PPA is central element in development and growth of independent generation providers
 - It defines the revenue stream for the project and credit quality and is key to obtaining project financing
- Key terms of the PPA can be the result of competitive solicitations through RFP or through auctions

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Contracting Risks and Uncertainty

- Risk Event Planning Long term demand- Who pays if demand is lower or higher than expected?
- Procurement The least cost supply option- Who pays if we contract for supply that is the wrong size, built at the wrong time, in the wrong location or using the wrong technology?
- Dispatch Fuel availability- Who pays if you do not use fuel resources efficiently?
- Retail Real time demand- Who pays if demand is higher than expected in real time?

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Case Study Public Service of Colorado

The 2017 All-Source Solicitation took the form of four separate RFPs

- The Company Ownership RFP sought proposals from third parties for the sale of generation assets to PSCo under contractual arrangements such as build-own-transfer (BOT); the utility also submitted its own proposals to build new generation through this RFP
- The solicitation received highly competitive bids such as wind PPAs at 25-year levelized costs of \$14/-20/MWh (after accounting for production tax credits worth \$23/MWh)

	RFP Document	Resource Types	Commercial Structure
Utility-owned	2017 Company Ownership RFP	<ul style="list-style-type: none"> ▪ New or existing simple cycle gas turbines ▪ New or existing wind or solar 	<ul style="list-style-type: none"> ▪ BOT ▪ Existing Resource Sale ▪ Internal Company Development
	2017 Dispatchable Resources RFP	<ul style="list-style-type: none"> ▪ Simple cycle gas turbines ▪ Combined cycle gas turbines ▪ Stand-alone storage projects 	▪ PPA
IPP-owned	2017 Semi-Dispatchable Renewable Capacity Resources RFP	<ul style="list-style-type: none"> ▪ Solar thermal with thermal storage or fuel backup ▪ Any other intermittent resource with storage or fuel backup 	▪ PPA
	2017 Renewable Resources RFP	<ul style="list-style-type: none"> ▪ Wind ▪ Solar without storage or fuel backup ▪ Hydroelectric ▪ Geothermal ▪ Biomass ▪ Recycled Energy 	▪ PPA

Source: <https://www.xcelenergy.com/static-files/ce-response/CompanyResource2016%20Regulations/Resource2017%20All-Source-PPA-Company-Ownership.pdf>

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The Importance of Transmission Access (Wheeling)

Traditional Utilities

- Vertically integrated utilities plan, build, and dispatch their plants to meet their load and receive revenue on a “cost of service” basis
- Vertically integrated utilities have always bought and sold some amount of power off-system
- Providing access to the transmission system is critical to allowing competitive wholesale markets for electricity to exist
- Utility is no longer allowed to provide preferential access to ship power across the lines to their own customers, all entities have fair access on a non-discriminatory basis
- But they do have to pay for it...

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Transmission Open Access Transmission Tariffs

Open Access Transmission Tariffs (OATT)

- A transmission system owner under FERC’s jurisdiction must file an OATT that provides details on the operation of and rates for their transmission network, as well as other market rules
- The rate charged for transmission access is the same rate the transmission owners (TO) charges its generation affiliate for the same path (as set out in the utility’s OATT, approved by FERC)

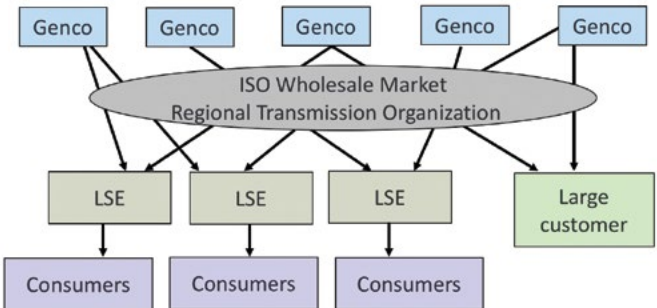
But How Does it Actually Work?

- Seller requests Point-to-Point (PtP) service from source location to a sink location (can only be one market over) and pays the OATT-defined price (often referred to as the “wheeling rate”)
 - Can request PtP service and reserve the transmission capacity hours to years in advance
 - Pay more for longer-term “firm” service that’s guaranteed than short-term “non-firm” or “interruptible” service
 - To get all the way to California you’d have to string a large number of PtP requests together through a largely uncoordinated and messy process
- PtP service gives you the right to schedule power if you want to (not an obligation to do so)
 - Days or hours before delivery, you actually schedule your power flow, through individual system operators’ Open Access Same-time Information System (OASIS)
 - If you schedule your power to be delivered to a hub, you can sell it bilaterally at the wholesale market price at that delivery point (to a local buyer, or someone who wants to ship it further down the line)
- This process is still used in non-market regions as well as at the seams in between RTOs

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Restructured Markets - Wholesale

Wholesale competition - Centralized Market Design



Generation Companies (GENCO) ; Independent System Operator (ISO)
Load-serving Entities (LSE)

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APPENDIX C: INTERVIEW SYNTHESIS REPORT

An anonymized summary of participant interviews is available in English and Spanish.

Interview synthesis

July 13, 2018

During the interview process seven main questions were asked to the participants (listed in Appendix D). The questions created subtopics, as part of the discussions by the participants. The subtopics resulted in twenty two questions, that are represented in this synthesis.

PUBLIC COLLABORATIVE FOR PUERTO RICO'S ENERGY TRANSFORMATION

How to read this document

In June and July 2018, Rocky Mountain Institute (RMI) and Institute for a Competitive and Sustainable Economy (ICSE) staff interviewed 41 stakeholders in the Puerto Rican government, private sector, and civil society, as well as key external stakeholders from outside Puerto Rico, (see list of interviewees and interview questions in Appendix D) to explore their concerns and aspirations for the Public Collaborative and the Puerto Rican energy sector as a whole.

Apart from section titles and headings, the text in this document is entirely quoted (but not attributed) from the interviews. The interviews were conducted in some cases in English, in others Spanish. Some quotes have been modified for clarity and translated to English. A Spanish version of this document will be made available.

In some cases, the quotes are repetitive about an issue. In others, there is divergence and opposition in thinking. The purpose of reading this document is to be with the tensions that arise—in yourself and in the text—toward developing a fuller understanding of the ideas held among stakeholders. Note that this document does not attribute any particular quote to any particular individual.

This document has been created to prepare and inform participants to the Public Collaborative for Puerto Rico's Energy Transformation. We will use this synthesis for a basis of discussions at the July 19-20 and August 23-24 meetings.

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WHAT IS GOING TO HAPPEN, AND WHO IS IN CHARGE?

Uncertainty in the energy system is one of the main problems.

Which energy policy will the Government be pushing toward the future? The uncertainty is the result that will benefit the country.

Where is the plan? Who approves it?

What is going to happen to PREPA?

It is unclear who is running this show.

Focus on repaying bondholders, right?

What sort of community representation is involved in this?

How are projects going to be financed and repaid?

HOW DO WE REDUCE COSTS?

Electricity is the source of all the needs of our society.

Once costs are incurred, customers are stuck with costs.

What if electricity gets even more expensive?

No one knows when and how the bankruptcy process will finish.

Residential rates are incredibly high; cost of living is very high.

Cost of electricity is high even with subsidies.

We need a clear and fair rate schedule.

Investors and [business] owners do not trust PREPA and the Governor. One day they'll tell you it's one rate or one day it's another, or they create additional taxes.

The biggest gap is money.

We need to figure out how we are going to balance the budget, hopefully without increasing rates. Otherwise, the spiral will continue.

HOW HAVE HURRICANES IMPACTED THE ELECTRICITY SYSTEM AND THE ISLAND?

Many businesses will remain closed after Hurricane Maria.

After Hurricane Georges in 1998, FEMA brought forth a series of recommendations, including improved resiliency and continuity of essential services. Those recommendations weren't implemented.

It took two months to admit that an emergency manager was needed.

Most people don't expect the problem to be solved right away, but they want to be assisted and want explanations.

After Georges, every business owner or person who could afford it knew they needed a generator.

The system was not designed to manage catastrophic events.

During hurricane recovery, the main issue had been the lack of information.

If this same hurricane came through Miami, what would the recovery look like?

After Maria we find 5,000 to 8,000 businesses have closed—and are unable to reopen.

The infrastructure was reconnected but not improved.

Because of Maria, businesses can no longer get insurance policies to hedge against business interruption in the event of a hurricane. PREPA's response was simply that bad.

More than 10,000 people are still without electricity.

Distributed energy can be good; however, if there is no distribution system, what do you do?

Communications were also affected by the lack of power. No power—no communications.

There is no real transformation in process.

Access to electricity is a human right.

A lot of people are trying to “help,” but lots of ulterior motives are at play.

There was a huge pile of coal ash outside the coal plant when Maria hit and that ash was dispersed everywhere due to the winds.

HOW ARE WE THINKING ABOUT RELIABILITY AND RESILIENCE?

Average Puerto Ricans are thinking about reliability, blackouts. No one would talk about this if not for the storm. This is not a bigger issue than it really is.

How can we have resilience if we don't have reliability?

Aguirre is in southern Puerto Rico, and the population is in the north. Not a great place to site generation.

Transmission lines are fragile.

For some, reliability is more important than cost.

Maximum resilience is solar on every roof and batteries in every house with sharing between them.

What is the definition of resilience?

HOW DO WE MANAGE POLITICS AND SO MANY STAKEHOLDERS?

Everything needs to be competitively bid. They won't get the best cost otherwise. Cronyism.

Influence is behind closed doors.

The executive branch doesn't know what is going on.

Without proper mechanics and if RFPs are run in closed conference rooms—this process will be a sham.

Deterioration of the electric system contaminated by partisan politics and lack of consistent policy.

Bills get passed, become laws, and then aren't enforced. We were supposed to be at 12% renewable energy by 2015.

Senators Seilhamer and Bhatia consider coal and natural gas to be cheaper and better. They use the AES plant as an example of cheap power.

The influence of Congress toward a particular direction as the condition for funding. That is a big problem.

I wish I could be cautiously optimistic, but history shows that the politicization of processes in Puerto Rico is a terminal cancer.

The Governor is the final decision maker. But the Senate and Congress have to step up.

Even the FOMB and PREC are at each other's throats.

Both parties use the electricity system as a political pawn.

The union is looking more to the benefit of the country rather than our own benefit.

The government is the most important stakeholder.

The Governor is looking for a quick solution to this. Then you have the federal interests, Wall Street, etc.—these are the parties that always win in the end.

PREPA could have a devastating effect on future plans.

PREPA is not the problem—the damage was self-inflicted by the partisan politics.

I am concerned about the governance of the electrical system. The system is basically political, and it shouldn't be.

There's no respect for PREC.

FOMB does whatever they want.

In the past we have lacked a consistent public policy on energy, which creates costly uncertainty for investors.

Need to set a baseline for what the current energy policy is. We have not implemented the policy.

I am glad Seilhamer is leading the effort to develop a public policy and is trying to do so in a bipartisan way.

The generation of energy should be in the hands of those who produce it. Consumers should be the owners and administrators of public services.

Governor's power over PREC needs to be restricted.

Situation today is very different than 10 years ago. The union walkout 10 years ago scared politicians.

A true public policy was never created and now we are paying the price.

Act 57 has put us in a less favorable position because it gave the impression that a public policy was enacted when in reality it was just a regulatory framework.

We need strong governance. Good progress was made when PREC was established as an independent body. There were changes made that make it less independent and if we continue down that path, PREC's effectiveness is going to be impacted.

Government should be on the sidelines and act more Title III proceedings. What's going to happen with the bankruptcy?

Who controls the system? We are concerned that the system is controlled by foreign agents, like generation companies, solar generation companies, and others. So we could end up with a modern system, but foreign controlled.

If we do not have a plan for energy policy, we are going to have this same discussion next year.

WHAT TECHNOLOGY OPTIONS ARE AVAILABLE TO US?

Using fossil fuels is necessary, but we should use them the least amount possible as the system transitions to renewable and solar energy.

I am worried about the barriers to enter the market.

I'm concerned about overbuilding gas units and how that gas would be available and useable here.

Our concern is that restrictions are imposed—like surcharges on solar generation—to support a long-term, fossil fuel generation system in order to assure a small number of (fossil generation) clients.

Overcapacity is an issue and will discourage microgrid development. Interconnection delays result from overinvestment.

Renewables lead to competition with the PREPA system.

Energy efficiency should come first. Everyone benefits except for fossil fuel interests.

Not everyone understands that there are significant costs associated with renewables. Solar is not free, and I think expectations are way too high for renewables.

Do rooftop solar everywhere, reducing line utilization.

The losses from the North/South imbalance are large. On top of that we are burdening the South with the pollution from the fossil generation, especially coal.

We need to avoid unnecessary investments in centralized generation.

We should determine the perfect combination of energy resources that we could employ to make us economical and resilient.

We need to develop resiliency codes and protocols for new generation.

Does it really make sense to invest in generation infrastructure in the South?

We need to boost investment.

T&D is too fragile, and the next months are critical.

Natural gas in the short term is important for base load, but controversial to environmental groups and likely unnecessary in the long term.

We need to isolate the regional needs of the island and start to identify capacity that can deliver against those regional needs. Perhaps we can divide the island in 7-10 regions.

We need to build in flexibility so the system is adaptable and can respond to Puerto Rico's unpredictable macroeconomic trends.

How much energy will be distributed vs. how much will be centralized?

We should better understand the role and importance of the IRP; that's where many of the specifics regarding grid architecture are determined.

Any large capital investment should be approved by the Commission before going forward.

We need to make sure critical infrastructure has sufficient backup power.

Smart metering is key.

Hydro generation for remote communities should be considered.

Waste-to-energy technologies need to be considered for their high efficiency generation.

Consider undergrounding T&D infrastructure in critical areas.

A rapid transition to 100% renewable energy, including electric vehicles.

MATS compliance issues are adequately addressed.

Greater attention paid to energy efficiency and demand response. Currently, the thinking seems to be to build more generation, but low-cost energy efficiency measures benefit everyone across the island. It could also spur job growth in that sector.

WHO IS SETTING THE VISION? WHAT'S THE PLAN?

The Legislature could set the vision right now.

We need to establish more clarity around the difference between energy policy, energy regulator, and the utility.

The government is making decisions in a way that is not necessarily coherent and well-thought out. We should first define what kind of energy sector we need to support our society, improve quality of life for residents, and improve economic conditions prior to defining the governing structure. From there, determine what is the most appropriate governance structure to achieve those goals of social well-being and economic prosperity.

Puerto Rico can become an exporter of technology.

Everybody has an idea, but nobody puts a price on it.

I am worried we might continue with the same model that has gotten us in this mess in the first place: centralized, fossil fuel generation.

The Building Better report: are things really going to be better?

We need agreement on what is a transformation—"from something to something else."

H.B. 1481 was a badly done exercise by the administration.

We need to get around the private interests and preferred vendors who have undue influence.

When am I going to be able to choose my electric company?

There are many stakeholders and views that cannot be put in a single document or plan.

Many studies and “talks,” but there is not a structural plan. There is not an IRP, but there is an RFP for the sales of assets. There is not a plan; there is not a road map.

System should be based on endogenous energy, affordability, and the promotion of local participation. Clean, renewable energy based on solar rooftops with a goal of 10% renewables in the future.

The Governor has been bad at communicating what is going on. It is scary and the bill (H.B. 1841) illustrates how little the Governor knows about what is going on.

Equity—allow for participation, even of the poor sector. Do not leave them stranded with costs.

How the current administration will work with current stakeholders.

PREPA and PREC need the best talent available.

A human right for energy, which has been transformed into a commodity. Beyond the transformation of the system, the social element is important.

Markets. Stimulate markets.

An IRP for Puerto Rico’s electrical system is required rather than only for PREPA. An IRP is the only way to constrain costs moving forward.

There is a lack of futuristic vision toward the development of the system.

We need to empower the people.

Need to allow for a space of contribution in the sector to serve as a catapult to a new state, but still respond to the day-to-day pressures of the economy.

Need to take whatever steps to ensure that the process is objective—legislation is the right way to do this.

Can imagine a future where all your energy source is in your pocket—need to throw your aspirations as far into the future as possible.

This process will most likely lead nowhere.

How should the \$15 billion be spent? And should it go toward regionalization?

How do we depoliticize the whole process so that we can achieve the greatest common good?

We must understand that the situation is very different in Puerto Rico than in places like Texas or Montana.

We need to decide the level of influence we will allow from the fossil fuel industry.

The government should not impose its vision.

We need to start thinking and living like a Caribbean island that is always at risk of getting hit by large atmospheric events; all we can do is become better prepared to withstand them.

WHAT IS TO BE DONE WITH PREPA AND THE PRIVATIZATION EFFORT?

PREPA is the main problem. People don’t trust PREPA anymore.

Competitive markets can be self-regulated and remain competitive at the same time, at both centralized and distributed levels.

Privatization is one of many ways to address the politicization of PREPA, but not the only one.

We need an open bid-procurement.

A well-run public sector can be more efficient.

Selling the PREPA plants will not help. We will get locked into old technology.

The fact that they already want to do the concession before the vision is dangerous. Everyone thinks this is crazy.

Governor wants to advance a model that is not feasible in Puerto Rico.

Imagine destroying all the rooms in your home while you're living there.

There needs to be a market-based approach.

We should not substitute a public inefficient monopoly with a private monopoly.

The system that we have is frozen in time. It was based in the 60s and 70s and never evolved.

How do we create healthy competition but also regulate the competitors?

I am concerned that if and when we privatize, we could end up falling into the hands of private investors who will dictate the future of the country, not the people of Puerto Rico.

Operations of PREPA are appalling. 53% of consumer calls aren't answered. There is a lot of customer frustration.

Because PREPA is government owned, if PREPA acts imprudently, you can't say that shareholders are going to eat this. Cost gets passed on to consumers instead. This is a big problem in terms of accountability.

Privatization is not the only strategy.

PREPA can't afford to pay the legacy debt, but can't afford to keep going with fossil fuel dependence.

Lack of customer focus by PREPA. That is a symptom of the organization.

Puerto Ricans don't care for or like PREPA's fiscal plans.

Bring PREPA to the 21st century!

PREPA is organized such that they lose about 15 to 20 percent of the energy through the process of transmission—and are charging us for that cost.

The ideal model is the cooperative and this is happening spontaneously among organizations, people, and municipalities.

I'm not a believer that the private sector is better than the public sector.

Not sure they will find buyers for the existing fleet.

People say we need to privatize PREPA for whatever reason: invoices not coming or blackouts, which are not the real issues, they are temporary ones.

I don't understand why the PREPA IRP sessions are closed sessions. Is PREPA is trying to hold people hostage to their comments?

The FOMB will probably have to approve any concession or sale.

Although there is a lot of buzz around privatization, not everyone is pro-privatization—there is actually substantial divide on this topic.

How will legacy debt be handled? Lots of decisions depend on this.

We need to eliminate the "no consequence culture" at PREPA.

We should allow the P3 process to run its course; the P3 process provides clarity on how the process should happen.

What generation is sold through the privatization process and how this will affect the penetration of more distributed generation.

For the sale of PREPA assets, we need a strong piece of legislation that allows for new technology, better reliability, and increased resiliency.

What is competition? How many producers can we have in Puerto Rico? 3-4?

I don't have a stance on a public vs. private model, or a municipal model for that matter. All I want cost-effective and reliable power for Puerto Ricans.

We need to improve customer service at PREPA.

We need to maximize federal contributions and FEMA funds. This is the right time to ask for funds and then we can privatize down the road.

The concession of T&D and the sale of assets is incompatible with the restoration of the grid. The privatization process needs to be done with a clear vision in mind.

In the short term, the P3 process clauses for agreements need to be in accordance with the needs of the people.

We need to force PREPA to unbundle so the true cost of the different pieces can be assessed. A buyer needs to know what they are buying.

There is a risk with neoliberal privatization, as it is tainted with both private AND political incentive.

I am suspicious of privatization as the answer and golden ticket to making PREPA work.

The transaction needs to happen. It is overdue. I applaud this government for having the will to go through with it.

99.9% of investors prefer private over public. Private does a much better job and is more efficient.

How will we know what to sell without a solid IRP in place?

The real question is when does renewable energy become the real priority for investment? How do you emphasize distributed generation, microgrids, and private capital?

How will the federal court be involved in blessing new contracts?

Even with a good regulatory framework and strong regulator, it doesn't matter without a good process on how to transition PREPA. That needs to be transparent.

The plan should be compared to the FOMB approved budget for PREPA and if disagreement exists, highlight why the point of contention is an important consideration.

PREPA and its workers are well intentioned.

We need a faster and more efficient takeover of PREPA compared to the telecom privatization.

A cost-benefit analysis should be conducted between the privatization of PREPA and its continued structure as a public entity.

Private investment, within the current PREPA ownership structure, is aligned with PREPA's goals of affordability, reliability, and resilience.

PREPA is full of good people, but they don't know any better.

WHAT IS THE ROLE OF THE REGULATOR? WHAT SHOULD THE REGULATORY PRIORITIES BE?

Regulations have been promulgated without much input. PREC doesn't ask for input.

I'm proud of the commissioners we have. They are responsible and knowledgeable.

How will the Energy Commission be finally constituted with independence and decision-making?

PREC is focused on being ethical and sound in analysis, but they forget they are a public entity.

They don't talk to the public. If you don't inform the public, people don't know or understand what PREC does.

The new legislation gives PREC 15 days to look at privatization plans and does not allow for follow-up discovery, requests for information. This is inadequate and more like creating a rubber stamp for the commission to bless it.

Commission required PREPA to get pre-approval for IRP projects. PREPA ignored the commission.

No one is backing the commission.

Balance of regulation is to not be overbearing, but provide enough clarity to spark the market.

What about performance based energy efficiency? Energy efficiency resource standard?

We need to solidify the role of the independent energy regulator.

We need to give regulatory proceedings sufficient time; documents need to be available with enough time for the process to add value. PREC must have sufficient expertise and knowledge.

How to establish a regulatory framework during the privatization and bankruptcy?

As long as the governor gets to select the representative from PREC, the governor can control the energy process. If the governor had to pick from a pool of applicants it might be less political.

WHAT IS MY ROLE IN THE TRANSFORMATION?

I am very confused, and I think many people are—people are more uncertain than they are knowledgeable.

Ideas need to be followed-through on and executed.

They do not have eyes that we have.

We better make this right.

There is a lot of divergence. It will take a lot of time and effort to get to an agreement.

The consumer needs to part of the decision-making process.

Whatever is done—will it have broad political support?

How is the plan going to work with so many stakeholders?

We need quality over speed in the legislative process.

We need to start making more data-driven decisions.

It is important to understand that “We can do this work.” We need investors and consultants, but “we can do the work.”

HOW IS THE HISTORICAL SYSTEM HOLDING US BACK?

Two natural gas pipelines were rejected because of a lack of education. Consumer education is key in facilitating execution of projects. For example, the natural gas storage depot passed because consumer education started 2-3 years prior.

We need to enforce interconnection regulations for distributed energy systems.

The process for wind and solar farms has been disorganized, without consideration of technical data studies, or facts, leading to a lack of trust.

1990s saw a diversification of energy sources with the addition of coal and natural gas.

PREPA has not followed a standard construction permitting process.

Renovation plans had been developed previously but were never executed.

Common for key projects to be started and not completed. For example Via Verdy: over \$30M in promotion, analysis, and studies. Similar story for the Gasoducto del Sur, where almost 30% of the cost was lost.

The original electricity systems in Puerto Rico were small, localized systems in urban centers. The island depended on much smaller systems. A variety of solutions, like the origins of electricity in Puerto Rico, may be the future.

Renewable energy is most important because it has been proven to be more flexible than other forms of generation; you can generate as little or as much energy as you need, from enough energy to charge a cellphone to the output from a 600 MW plant.

There is insufficient redundancy in terms of emergency planning.

Maintenance has been insufficient and seems to be perpetually postponed.

Our current compliance certification process is questionable.

How did we allow ourselves to be in a position where we don't really have an alternative to bunker fuel?

We can't just look at economic factors. Electricity from the coal plant is unarguably cheap, probably the cheapest, but if we only consider economic criteria we can end up with much worse problems down the line.

The electric system is designed poorly and reflects years of misplanning.

The biggest issues are trust and uncertainty. If you don't know what's going to happen with regulation or technology, you are not going to invest.

Laws don't actually matter here. The court system is very weak. Ballot measures in the past simply have not been implemented.

The net energy metering (NEM) regulation is good on paper, but PREPA is moving too slowly and it is too weak to be enforced.

WHAT SHOULD WE DO WITH MICROGRIDS?

The net metering interconnection process was so difficult we needed to enact a law. PREPA has been delaying the implementation, as suspected.

Need to turn to microgrids due to the lack of generation capacity in the North.

How do cooperative and municipal microgrids fit in?

Our timelines for microgrid interconnection are much much longer than on the mainland because PREPA is so resistant.

Our system is designed for micro-grids. "Sectionalization" of the system is done daily. That was how the system was restored after Maria.

Microgrids will leave the poorest stranded with the costs.

A spontaneous movement is taking place by the population to look for disconnection from the (electric) system and to create systems that serve communities and municipalities.

For distributed sources and microgrids, how can those be done in an interconnected, dynamic way so that we limit outright defection.

Everybody cannot defect from the grid, so the best solution will still need a viable product and price that everybody can afford.

How will microgrids and the macrogrid work together?

A system with municipal microgrids and localized grid managers in control. A few of the larger cities with strong tourism and industrial bases could have their own, private utilities.

HOW DO WE IMPROVE ELECTRICITY SERVICE?

Rates have been very unclear, with numerous different rates. At some point there were over 200 different rates depending on the industries and who was asking.

There was a commission order for PREPA to create key performance indicators. Not sure what happened to that.

Rate uncertainty due to PREPA's estimated invoice practice; PREPA could revise invoices even over a year later.

Lack of power affects all sectors; business interruption due to lack of power is a big issue.

Inconsistent and unreliable power is costly due to the damaging effects on equipment.

Unreliable service that does not catch up with state of the art technology.

PREPA is not responsive to customers.

HOW WILL THIS PRIVATIZATION DIFFER FROM PAST ONES, WHICH HAVE NOT GONE SO WELL IN PUERTO RICO?

Privatizations during the 1990s: unsuccessful PRASA attempt and PR Telecom's confrontational, "bloody" transaction. Those public utilities could be improved.

Our experience in the past with privatization has not been good. We need to learn from history.

Water utility was done by concessions: Compañía de Aguas (1999), Ondeo (2000). Both concession models failed.

HOW CAN WE IMPROVE PREPA?

PREPA does not do what this commission says. They only listen to the governor. They have an interest to maintain the status quo.

At one point, PREPA put together Key Performance Indicators. Having them report on their progress and making it transparent on their website and in reports would be a very good thing.

On a positive note, PREPA's employees have significant control over the operations.

PREPA keeps the government hostage because of the union.

PREPA will continue as a monopoly. There is nothing I have seen to suggest the contrary. There is no succession plan as far as I can tell.

PREPA needs to have a response plan, which did not happen. There was no assessment of the system.

There is a strong, 'no-change' culture within PREPA, which began in the 1970's when vendors, unions, retirees, and politicians effectively took over PREPA, pursuing their own interests.

You have a monopoly who has done what it wants for 70 years. The culture is toxic. In the 70's you start to see rent-seeking behavior. Politicians started to plant people into the Authority. This hasn't changed much today.

There has been no organizational support for the professional management of PREPA. PREPA is a story of political deal-making as the basis of a semblance of management. As a result, PREPA hasn't been well-managed in decades.

PREPA has become a big, powerful company and no Governor has been able to control it.

The non-managerial staff is PREPA's biggest asset.

Up until now, the interconnection process with PREPA has been very challenging, but we are worried it might become impossible.

Before we had a body of personnel that was in charge of maintenance but now we have trimmed down the maintenance team; as a result, we end up needing to pay much more for mainland crews to come do the work that could have been done by Puerto Ricans at a much lower cost.

WHY HAVE PAST COLLABORATIONS FAILED?

There have been several efforts in terms of collaborations, but collaboration has proven to be hard and complicated. Some of the actors just don't participate if they do not like the discussion.

Discussions usually end in disputes.

Differing visions need to be converged into a common vision.

When there are power imbalances across parties at a negotiation table, it is common for the party with less power to just "stay calm and block."

Often we limit ourselves to keeping the conversation too "light" and don't touch on the really hard topics. We tend to stay on the surface—on conversations that don't go too into the details.

WHAT SHOULD THE NEW POLICY LOOK LIKE?

Rather than creating a big, new law (and in doing so, replace 57, 82, 83), we need to create a coherent structure reflective of existing law. Amend/build on existing laws.

A well-regulated market structure that encourages competitive pricing and reliable service.

A plan that addresses job creation and growth around the island.

The solution needs to have bilateral support from within the Puerto Rican political system. This will increase buy-in from the public.

New legislation that reinforces the power and independence of PREC.

Stronger enforcement of PREPA's IRP is needed.

If the Senate sets basic objectives of what it wants the next cycle of investment in Puerto Rico to look like. The FOMB fiscal plan and PREPA's updated IRP should be the foundation of these objectives.

The state energy office becomes the main energy advisor to the Governor and implementer of policy, as opposed to PREPA.

If fiscal control of Puerto Rico is taken back from the FOMB.

A strong regulatory framework that is not politicized and not exclusively founded on economic principles.

The long-term plan is insulated and protected from political changes. Historically, policy has shifted every four years, which is not helpful.

Elected decision makers, as opposed to the P3 office, Citi, and Rothschild, guide the process, are involved, and have control of the outcome.

That the regulatory structure developed is sophisticated enough and the physical infrastructure becomes strong enough so normal Puerto Ricans don't all have to become energy experts. A buildup of trust in the energy sector.

Policy makers receiving more education about the nuts and bolts of the energy sector and potential privatization process.

HOW CAN WE DO BETTER WITH UTILITY PLANNING AND TRANSPARENCY?

Attention should be paid to market design instead of specific plants in specific locations at the beginning stages of this process.

Any T&D concession should be a competitive bidding process, adhere to industry standards from the mainland, include collective bargaining agreements, and have a preference for hiring Puerto Ricans.

Equal consideration of all information submitted to decision makers.

A comprehensive, coherent effort to develop a plan while considering numerous, alternative scenarios. A clear explanation of the solution and why it was picked over other alternatives.

A slower, more methodical approach that defines a clear strategy, sets expectations from the beginning, and identifies clear outcomes.

It needs to consider the long-run implications of the solution.

Special consideration should be given to the press and spokespeople used to advocate for the plan since politics is such a sensitive issue in Puerto Rico.

A plan should contain short term (<5 years), medium term (5-10 years), and long term (10+ years) aspects. This would increase the plan's credibility.

It should be sustainable, but efficient and profitable for everyone.

Short term sacrifices in the name of long-term benefits and lower cost energy should be considered.

The process should be open and transparent, with a publicly available report.

Personal interest needs to be set aside to focus on building consensus around the public good.

A plan needs to combine local and federal efforts, but in general, less government is better.

Excessive labor regulations should be included in the planning process as well, since labor and energy are two main factors of economic growth (or decline) in Puerto Rico.

Technical feasibility of any proposed solution must be evaluated.

For this roadmap to be successful, the country needs to define what the energy system should be, not what the capitalists want to sell or what they want to burn.

HOW CAN WE BRING PEOPLE TOGETHER TO CO-CREATE A SOLUTION?

The vision requires broad-based stakeholder education because people need to know what is at stake, but right now most people feel totally detached from the energy sector.

We need to encourage the population—the consumers—to become more responsible.

Contributions from stakeholders, policymakers, and the Legislature. Academics, NGOs, and experts both within and outside of Puerto Rico should also be included.

Educate and empower the people by giving them control.

What are the roles and responsibilities of those who have proposed transformations?

Clear understanding and translation between Spanish and English speakers.

Full consensus for the plan moving forward is needed.

Including all unions is important, and not just one or two. Respect for labor and their participation in any reform effort is absolutely necessary since they will remain an important part of the solution.

The people and communities of Puerto Rico must be sincerely engaged from day 1 in the formation of this new vision. Ensuring that the decision makers take this input to heart is critical.

An understanding that participation does not imply or equate to consent or agreement.

The process should engage entities that already have the trust of different communities.

Increased knowledge sharing among parties.

The plan should be generated outside of the political realm.

WHAT ARE SOME OF THE LONG-TERM OUTCOMES WE'D LIKE TO SEE?

The creation of a more resilient, more cost effective energy system for the island.

If Puerto Rico can move on from its post traumatic stress disorder after the hurricanes and shed its colonial stress disorder.

Different parties coming together around the things that unite them and ensuring their futures are not defined by others.

Puerto Rico becomes a showcase for the planet in terms of incorporating distributed renewable energy technologies, microgrids, and redundancy into its electric grid.

A grassroots, community-based education and advocacy effort focused on solar and energy storage.

Puerto Rico can exploit its singularities: very spread out, large grid for such a small geographical area and very unique topographically. Renewables and storage have challenges, but if you can create the right structure so that companies evaluated to come to PR conduct R&D, give something back to the people, especially in remote communities, and prove concepts with projects, we can become an exporter of technology and know-how. This is one niche where PR can become a positive example and improve its economy.

HOW CAN WE FAIL TO ACHIEVE OUR GOALS IN THIS COLLABORATION?

Greater levels of control over PREPA are not achieved.

If the government is too involved in regulation and the market.

The power of the independent regulator is diminished.

Repeating the same mistakes from the past.

Political stalemate occurs and no progress is achieved.

If local disagreement allows FOMB to take control over the situation.

No evidence of change or efforts toward greater efficiency within PREPA.

Parties are not able to agree on any common ground.

Participants are not communicating openly and honestly.

Certain, important stakeholder groups choose not to participate or exit the process.

Equality among the various participants is not perceived or realized.

The technical aspects of the discussion are too far in the weeds and certain groups are unable to fully participate or understand what is being explained.

Labor interests are under-represented throughout the process.

Participants come out of the process more pessimistic than optimistic about the future.

Certain voices being valued or represented more than others.

Everyone pushing their own agendas.

Special interests from abroad or “disaster capitalists” maintain their self-interested positions and do not have the greater good in mind, dictating the future of Puerto Rico.

People from the mainland come to the table assuming they know all of the answers. Bondholders or other interested parties interfere with the solution.

Lack of transparency.

Alternative options are not developed or communicated to interested parties.

This report is not taken seriously by policymakers.

This report is not released to the public or disseminated among decision makers.

If all we do is transfer ownership of assets and everything else stays the same.

Tradeoffs among various factors are not clearly articulated and explained.

Important issues are not thoroughly discussed, even if agreement cannot be achieved.

Facilitation of this stakeholder engagement and the process is not implemented correctly or is ineffective.

Roles and responsibilities of different parties are not articulated.

100% solar is advocated as the solution, but it cannot be relied on for the entire electric system.

Energy theft across the island is not addressed.

If the plan to privatize PREPA continues.

Puerto Rico's debt situation is not part of the conversation and how it will be addressed.

Not conducting this process in conjunction with the FOMB fiscal plan.

Accountability is left unaddressed.

Examples of energy transitions and lessons learned from around the United States and other parts of the world are not used to inform the process.

Professional standards (across governance, financing, and electrical systems) are ignored throughout the planning process.

The transformation results in higher rates of inequality.

The mismanagement of resources occurs.

The procurement process is not open and competitive.

The implementation timeline is infeasible or is too long.

The plan's cost is unreasonable and results in higher rates.

It is not understood to be an iterative process. The first attempt will have weaknesses and not anticipating unexpected results will result in suboptimal outcomes.

Inadequate supervision over the implementation phase occurs.

WHAT CAN WE DO TO MAKE THIS COLLABORATIVE SUCCESSFUL?

Ensure that this is a transparent process and that the message is that this is a transparent process working towards the greater good, not individual or special interests.

We need to address lack of integrity, lack of candor, lack of transparency in a lot of place before successful transformation happens.

Consensus processes do not make policy in Puerto Rico, politicians do.

A collective voice provides integrity to the process.

Design an initiative that allows us to work together while knowing that we are different.

An open process.

You need alignment from all stakeholders, particularly PREPA and the government. All are important and are the backbone with great knowledge and experience.

Gauge interest and levels of support from other lawmakers (besides Senators Seilhamer and Bhatia) on both sides.

Whatever the outcome, someone will be upset. But that means you are doing your job.

Cost analysis of the ideas needs to be completed.

Paint a roadmap, with goals and objectives listed.

Describe where are we going to be in 5 years, 10 years, 15 years.

Have as an objective setting clear and measurable objectives for public policy over time.

Don't repeat the DOE meeting experience.

Get real: talk about immediate issues.

Avoid "teaching the natives about energy law."

Don't waste people's time.

We need to recognize there is not just one answer here.

You should illustrate what a non-incremental path looks like and describe if there is an ability to leapfrog and skip a few steps in the energy transition. You can do so by looking at where things are today in more mature markets, and how can we help Puerto Rico skip a few steps.

Very good that we are having these conversations so that parties can bring up their concerns upfront.

There is lot of animosity. It's a topic that requires us to be incredibly cautious.

Listen to all views.

Have a collaborative message.

Clearly outline the vision and mission and then identify the actions needed to get there.

Look at examples of former similar effort and case studies.

The data of the FOMB shared shows that only 12.5% of funding will stay in PR and that is not true.

We need to figure out a way to ensure money stays in PR.

We need to develop a pilot energy project. For example, we could develop one in Vieques or in Culebra where we need to think out of the box.

This effort is in a correct timing.

We need to educate people during this initiative.

Do not have false expectations that everybody will be happy.

Having an open mind and offer possibilities—not agendas—being realistic and convincing will be the correct strategy [toward success].

Actively engage participants in designing and defining public policy.

Explain what you desire from participants and what value you see in understanding their perspective.

Give case studies from other islands.

Properly addressing bias amongst stakeholders is essential.

Getting people to sit at the table is critical.

Separate people who talk a lot.

Evaluate how you [RMI] influence the process.

In-person presentations to decision makers is most important, in comparison to academic publications, mass media, or newspapers.

You will need to be good at navigating conflict within the room.

We need space for people to get on their soapbox but then really structure sessions.

The challenges are going to be to make information easily understood so people can reflect quickly and discuss quickly. We've just all participated in a dozen conferences in the past month.

The most successful ones are those in which small groups work together around a table (6-8 people) and report back their findings. Small groups are fabulously effective in neutralizing the extremes and getting to a consensus.

Make it iterative, not top-down.

Need to make sure that the spokesperson is unbiased.

You need to talk to everyone and know your stakeholders and their agenda. A lot of people will tell you what you want to hear without having any intention of being able to follow through or any ability to follow through with things.

You should work outside of partisan politics.

You need a strong facilitator.

You need a specific agenda.

It needs to be grounded in reality.

Make sure you make it clear that "You are the facilitator."

The need-assessment conversations are good.

Lot of people will lie to you. And you won't know it.

Concerns need to be considered up-front.

Everyone knows what we don't have, we should focus on opening up possibilities and letting people understand them.

Try to be as neutral as possible, but at the same time be able to send succinct and clear options.

Do not allow one topic to dominate.

Small groups are very effective.

You should have breakout session.

You need to host experts.

Interview a couple of potential participants on the privatization.

Ensure the process is iterative and not one in which stakeholders are talked-down.

Creditors should be part of the process, although I am unsure if they would attend.

Community groups implementing solar projects should be included in this dialogue.

Bring in psychologists, sociologists, community leaders, industry, government people, governor's office, PREC, and energy policy office.

Invite a diverse group of people even problematic persons.

Professors from UPR would be good to invite.

Make sure this effort includes several comprehensive and diverse groups like: Unions,

Environmental groups, Professional and trade associations, Prospective buyers, Coops.

Select who you are going to bring to the meeting, private sector and government. You'll need people with experience in diverse areas. "People like Seilhamer ...and Bhatia too... that helps..."

You should have the largest number of stakeholders as possible: Environmentalist, Sociologist, Community leaders, Casa Pueblo, Industry, Renewables, Natural Gas, T&D, Government Office, Energy Public Office, Union—UTIER.

We need to have the real stakeholders: Siemens, GE, retirees, employees, former PREPA buyers, PREPA, the people that really move the authority. However, most likely they may not attend.

You need to invite retirees/employees from the Authority. If the Authority is not in the process, then we aren't going to accomplish much. The Authority is not going to want to go.

The Cooperativa de Seguros Multiples should be included in this process.

Success is measured by diversity of those who are attending.

Talk to and be upfront about this process with people from different branches of government.

Ensure that the public can participate by holding alternative venues to share input, for example: regional public, public commenting period, electronic comments, public charrettes.

You may want to consider having a community town hall in a couple of places to get input.

The success of any workshop is measured by the diversity of opinions of those who are attending.

Invite as many people as possible, try to bring everyone together.

Design this effort so that it can be seen by as a public interest solution.

The biggest issue in this initiative will be perception.

We need to figure out whose voice carries more weight. E.g., I am for renewables, others are focused on fossil, we all know what camp people are in and what we need to decide is who or what side will carry more weight.

In the end the institutions that do have particular interest will influence the process. Institutions, like ours, without particular interest should have more weight.

Based on my experience on the PREPA past meeting, the contributions and positions of people need to be weighted properly. I don't know how different views and objectives may be weighted.

We were divided in groups at random. That could be good, not to mix-up all interests on the same group.

Shouldn't be a report. Instead, provide options.

There are more ways to measure success than just economic success.

Analyze the information in an unbiased manner.

Produce a document in a timely manner to inform government public policy.

Our output should have maximum visibility.

I recommend that whatever is put forward is done in a way that recognizes the unique context of Puerto Rico, and not just, "this is a great best practice from NY or CA."

APPENDIX D

LIST OF INTERVIEWEES

1. Alex Breckel
2. Alicia Lamboy
3. Angel Figueroa
4. Ángel Rivera de la Cruz
5. Arturo Massol
6. Cathy Kunkel
7. Carlos Pares
8. Clarisa Jimenez
9. Edison Avilés-Deliz
10. Emilio Colón-Zavala
11. Francisco Rullán
12. Héctor García
13. Ingrid Vila
14. Jaime Cuevas
15. Jaime Sanabria
16. Janine Migden-Ostrander
17. Jenn DeCesaro
18. Jonathan Marvel
19. Jonathan Castillo
20. Jorge Colon Gerrena
21. Jose Guzman
22. Jose Ortiz
23. Juan Rosario
24. Luis Alonso Vega
25. Luis Aníbal Avilés
26. Malu Blázquez
27. Manuel Reyes Alfonso
28. Marc Roumain
29. Nelson Ramirez
30. Noel Zamot
31. Pablo Vázquez
32. Pedro Nieves
33. PJ Wilson
34. Rafael Llopart
35. Ramón Luis Nieves
36. Rodrigo Masses
37. Ruth Santiago
38. Sergio Marxuach
39. Steven Spears

LIST OF INTERVIEW QUESTIONS

1. What are your main concerns and uncertainties related to the electricity system?
2. What pivotal experiences from the past, good or bad, are important lessons for the future?
3. What major decisions with long-term implications do we currently face, that need to be tackled in the coming year?
4. From your perspective, what would make this project successful?
5. From your perspective, what would make this project a failure?
6. What advice do you have for the design and facilitation team?
7. Is there anything else you would like to add that I haven't asked about?





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