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Testimony on the Rebuilding and Privatization of the Puerto Rico Electric Power Authority (PREPA)

I. Description of Current Situation of the Electric System in Puerto Rico and Its Importance for Future Sustainability and Self Determination

We appreciate the opportunity provided by the House Committee on Natural Resources to submit comments on the Rebuilding and Privatization of the Puerto Rico Electric Power Authority (PREPA).

More than eighteen months after Hurricane Maria, Puerto Rico is still depending on unreliable transmission lines that transport energy from the large, central station, fossil fuel plants in the southern part of the Island, through the central mountain range and tropical forests to the load centers in the San Juan metro area in northern Puerto Rico rather than rooftop solar communities, energy efficiency and demand response programs as well as energy storage systems. The transmission lines are frail and subject to constant breakdowns. Various blackouts after the alleged restoration of the electric grid have been due to transmission line failures that tripped the whole or a substantial part of the grid.

Currently, 97-98% of electric energy in Puerto Rico is generated from central station, fossil fuel combustion and only 2-3% from renewables, not nearly achieving the Renewable Portfolio Standard (RPS) established via legislation.[i] Historically, the Puerto Rico Electric Power Authority (PREPA) has made huge outlays of funds, up to three billion dollars ($1 to $3B) per year for fossil fuel purchases and payments under power purchase (and operation) agreements. The oil, coal and methane (natural) gas burned by PREPA and the two private electric energy plants in Puerto Rico is sourced from wells and mines far from the Island, which increases the cost of energy generation. The operation of all fossil fuel plants in Puerto Rico produces multiple contaminants that adversely impact public health and the environment. The main electric plants: the Aguirre Power Complex and Costa Sur (South Coast) and the plants with which PREPA has power purchase agreements, AES Puerto Rico, L.P. and EcoEléctrica are located in southern Puerto Rico and require an elaborate, costly and now, weakened transmission system to deliver power to the load centers in the north, particularly to the San Juan metropolitan area.

The Applied Energy System (AES) Corporation power plant and the Aguirre Power Complex, located in southeastern Puerto Rico are the two primary sources of toxic emissions in Puerto Rico

and disproportionately impact some of the poorest communities. The AES coal burning power plant in Guayama which transmits electricity to the San Juan metro area accumulates hundreds of thousands of tons of coal ash waste at its plant site that have already contaminated part of the South Coast Aquifer, the sole source of potable water for tens of thousands of people in Puerto Rico.

The two large plants in southwestern Puerto Rico both burn methane (natural) gas and also transmit energy long distance. Gas combustion is the substitution of one group of contaminants for others. The myth that methane gas is a cleaner energy source is a fallacy. The methane LNG used in Puerto Rico has to be stored under cryogenic conditions and revaporized before it can used at the plants. These additional processes add to the total emissions of LNG use in a way that exceeds the CO2 emissions of other fossil fuels. Methane gas combustion also emits increased Volatile Organic Compounds (VOCs) such as formaldehyde, benzene, toluene, hexane, and styrene. Pediatric Environmental Health Specialty Unit (PEHSU), Mount Sinai Medical School. pgs. 1-2. https://elibrary.ferc.gov/IDMWS/search/advResults.asp, Case No. CP13-193-000.

Continued reliance on these plants for energy transmission to San Juan and northern Puerto Rico is another disaster in the making.

Most of the high death toll, (estimated at almost 3000 lives lost) associated with Hurricane Maria is attributable to the lack of electric service to power life-saving medical equipment, lack of access to medical treatment and medication. The elderly are especially vulnerable during power outages. And Puerto Rico's population is growing increasingly older as working age people flee in droves in search of job opportunities that could be locally available with a swift transition to solar at or close to the point of use and other alternatives to central station, fossil fuel generation and long-distance transmission.

Civil society groups, including community, environmental, labor and academia have come together to promote a platform for the transformation of the Puerto Rico grid known as, "Queremos Sol", "We Want Sun" (queremossolpr.com). The proposal sets forth a vision, objectives and mechanisms to reach a goal of incremental advances in energy efficiency, demand response programs and escalating amounts of renewable generation based on community rooftop solar that would achieve 100% renewable generation by 2050. The Queremos Sol proposal stems from a previous effort known as "La Mesa de Dialogo Energetico" or "Energy Dialogue RoundTable". Shortly after the release of the Queremos Sol platform, the Puerto Rico Senate issued a bill to establish the Energy Public Policy for the Island that adopted the same 100% renewable energy goal. Afterwards, the Governor of Puerto Rico also announced the same energy goal. That is pretty much where the similarities end. There are extreme disparities in how the Queremos Sol platform, the proponents of Senate Bill 1121 and the Governor and the executive branch of government propose to transform the Puerto Rico electric system.

II. Opportunities for a Locally-Based Transformation

A. Governance

Historically, PREPA's decision-making has been driven by partisan politics rather than a commitment to energy planning in the public interest. PREPA must be freed of partisan politics and democratized. The transformation of PREPA must include multisector participation and

transparency so that the voices of multiple sectors of Puerto Rican society are reflected in the governance of the utility.

The following specific proposals included in Queremos Sol are necessary for the transformation of PREPA to best serve the public interest:

1- PREPA's **board of directors** should be appointed or elected to fixed terms and possess relevant professional qualifications and energy industry expertise. Terms should be staggered. Three board members should be appointed by the governor from lists submitted by: (1) environmental organizations; (2) labor unions; and (3) small business organizations. Two board members should be appointed directly by (1) the Puerto Rico Cooperative League and (2) the Association of Economists. A sixth member should be selected from the engineering faculty of Puerto Rico universities. Two members should be elected by PREPA's residential and commercial customers as consumer representatives, and one should be elected by industrial consumers as an industry representative. Board members should be dismissed only for cause and only if the resolution authorizing dismissal receives more than six votes. The board must have finance and audit committees, and the members of these committees should not overlap.

2- The PREPA **executive director** should be appointed by the board through an open recruitment process. The board should have just cause before dismissing an executive director.

3- **Reform of contract and enforcement policies** should systematically address all contract irregularities discovered in audits by the Office of the Comptroller and by the 2016 Senate investigation into the purchase of fuel.

4- **Internal restructuring** should be informed by various audits and investigations of PREPA fuel purchase practices that have highlighted the centralization of power and responsibility within its Fuel Office. The board should undertake a structural analysis of PREPA's operations to ensure that potentially conflicting operations are not centralized in a single office, particularly the Fuel Office.

5- The Legislature should authorize the creation of a non-profit, membership-based **PREPA Consumer Advisory Board** with access to all information available to PREPA board members, including all internal audit reports, and with the right to responses from the executive director to all written questions and statements submitted by advisory board members and with the ability to compel enforcement by the Puerto Rico Energy Bureau in the event that PREPA does not cooperate.

6- **Attraction and retention of an appropriate labor force** through appropriate policies aimed at reducing administrative costs associated with the large number of political appointments within the agency. Opportunities for workforce training, especially in renewable energy. An effective investigation into the costs of salary and benefits that PREPA has incurred due to political appointments.

7- Acknowledgement of **climate change as central to decision-making.** Climate change has typically been only an accessory in governmental conversations and priorities, in spite of

the significant impacts by way of social, fiscal and political impacts in Puerto Rico. Climate change must be understood as one of the central forces in the transformation of the energy sector, which is why it is imperative that PREPA integrate adaptation measures in infrastructure planning and that climate adaptation be inserted as a pillar in the design of all public policy, legislation and decision-making processes funded either publicly or privately.

8- **Effective opportunities for citizen participation and education**. Providing and supporting spaces for citizen participation in PREPA is in the spirit of publicly owned power companies and is vital to achieving baseline levels of agreement informed by inclusiveness and transparency. Energy conservation and resource issues should be incorporated into school curricula. Alliances should be established between the State Office of Energy Public Policy with universities and other organizations. Establishment of a roster of experts and companies complemented with the development of incubators for energy entrepreneurship and creativity. A energy literacy program including energy audits should be developed and aimed especially at small and medium-sized businesses and industry to implement conservation and reduction in electric bills.

9- **Promotion of labor sector participation**. Electrical industry workers are key to the sort of system change that will lead to a clean energy future. The term "just transition", defined as societal evolution toward cleaner energy resources and lower-emission economies while guaranteeing sustainable lifestyles and suitable workforce transition. In a just and equitable transition, affected workers, unions and communities are equal partners in a well-planned and carefully managed shift from fossil fuels to clean energy. A just transition provides employment opportunities for those who have traditionally been left behind and guarantees job security and livelihoods for energy-industry workers. Pensions and health plan benefits are preserved, and workers and members of affected communities have the right to first employment for any work created through the dismantling of fossil fuel energy structures. Workers also receive education and training and ideally are unionized with similar salaries and benefits. A just and equitable transition will commit each level of government and business in a unified effort; provides workforce training; replaces lost tax revenues; and creates lasting and good jobs that strengthen the economy and support working families, especially jobs related to clean energy, energy efficiency and climate resilient infrastructure. A just transition requires that those responsible for pollution are held accountable for clean-ups so that communities in transition have usable land and clean water.

10- **Appointment of an Independent Inspector General of the Private Sector (IGISP).** An IGISP is an independent firm with expertise in auditing and management that would have the power to investigate and audit the day-to-day PREPA operations and report relevant findings and progress. For more information on the use of an IGISP in New York see: https://getnicklaw.com/areas-of-practice/independent-monitoring/case-studies/new-york-racing-association/.

11- **A comprehensive audit of the debt** (and holding accountable those who participated in illegal debt issuances) **and a debt restructuring** that protects local bondholders (individuals, small businesses, cooperatives) while ensuring a substantial reduction or elimination of debt repayment by PREPA ratepayers in order to achieve an affordable and financially sustainable electrical system.

B. Technical Transformation

In line with the Queremos Sol platform, there is a noticeable move towards rooftop solar in Puerto Rico because these types of installations held up better than the transmission and distribution grid during the hurricanes. PV at or close to the point of use doesn't require fuel or much maintenance. The experience with diesel and gas generators in the aftermath of the hurricanes was plagued by fuel shortages, toxic emissions and machinery breakdowns. The Association of Renewable Energy Contractors and Consultants (ACONER, for its Spanish acronym) indicates that they were installing five to six times more rooftop photovoltaic equipment with battery energy storage systems after the Hurricane Maria than before. Scattered throughout Puerto Rico, a few communities, rural aqueducts, individual homeowners, small scale farmers and businesses and others are installing or planning to install solar energy systems.

A recently published report coincides with the type of transformation proposed in Queremos Sol:

> In the short term, the bottom-up approach to build decentralized resiliency from individual solar home systems, to microgrids, and all the way to the main grid needs to be explored as a potential option because a relatively high penetration rate could enable a variety of options for microgrid development that enhance the robustness of community resilience while also provides economies of scales. A. Kwasinski, F. Andrade, M. J. Castro-Sitiriche and E. O'Neill-Carrillo, "Hurricane Maria Effects on Puerto Rico Electric Power Infrastructure," in *IEEE Power and Energy Technology Systems Journal*, vol. 6, no. 1, pp. 85-94, March 2019. doi: 10.1109/JPETS.2019.2900293 URL: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8644031&isnumber=8673665

Puerto Rico needs to jump-start the transformation of its electric system to rooftop solar communities and businesses in a concerted effort led by civil society groups.

Queremos Sol participants are concerned about the impacts of climate change on the Island and seek to promote multisector discussion on the predictable effects of climate change in Puerto Rico; disseminate studies and information on climate change scenarios; generate discussion of mitigation and adaptation alternatives and their viability for Puerto Rico, and determine optimal parameters for planning for climate change, sea level rise, food security, water availability, among others.

Accordingly, the following alternatives to central station, fossil fuel generation need to be planned and implemented:

-Energy demand management programs that incorporate time of use incentives to address the nighttime peak and other demand response options;

-Energy efficiency and conservation measures;

-Utility scale distributed renewable energy installations sited in previously contaminated areas such as closed landfills as recommended by the National Renewable Energy Laboratories;

-Energy storage (BESS) for rooftop solar installations and at properly sited utility scale generation installations;

-Solar and micro-wind installations at schools, water purification and treatment plants, parking lots and similar areas;

-Rooftop solar installations and solar communities and businesses as recommended in studies by faculty of the University of Puerto Rico at Mayaguez (UPRM).

The advantages of rooftop solar or solar installations close to the point of use are many, they include the use of existing sprawling housing development and commercial rooftops to avoid further impacts to open spaces, agricultural land and ecologically sensitive areas. Rooftop solar eliminates the need for large investments in transmission infrastructure. It avoids transmission losses. Grid maintenance costs are reduced and impacts to tropical forests and vegetation as a result of tree cutting and pruning are minimized. The rooftop solar alternative doesn't require establishing extensive easements or servitudes on private property while helping to lower temperatures within the structures and providing protection to the buildings. Rooftop solar installations add value to the structures and promote local wealth. Distributed generation on rooftops creates greater reinvestment in the local economy than utility scale projects. It enables ratepayers to become producers or 'prosumers' of energy, not mere consumers and allows for control by residents and local communities and businesses which is particularly important during outages of the main grid as was experienced after hurricane Maria. Rooftop solar enjoys broad support from civil society contrary to land-based installations that have been the subject of considerable opposition.

The draft Integrated Resource Plan (IRP) prepared by Siemens Industry, Inc. for the Puerto Rico Electric Power Authority (PREPA) indicates that the unit costs for all customer alternatives considered are lower than the final all-in (ESM and S4S2) generation portfolio rates. (Pages 8-30 and 8-46 of the IRP). The cost of customer owned generation is significantly lower than the total rate even before the non-bypassable component is added.

In spite of the fact that rooftop solar is shown to be cheaper in the IRP (Exhibit 8-38 ESM Future Installed Capacity Mix) customer owned solar is severely limited to about 10% of the generation mix at the end of the IRP planning period in 2038. In the IRP, energy consumption by group indicates that commercial and residential clients constitute the lion's share of energy demand in Puerto Rico while industrial clients barely consume about 13% of energy generation. The commercial sector consists of sprawling malls with expansive parking lots that can be used to site solar arrays to power operations. Similarly, much residential construction in Puerto Rico consists of single-family housing developments known as urbanizations. They are especially expansive and prevalent in the San Juan metropolitan area and can provide the "rooftop resource" as it is referred to in the UPRM studies recommending widespread use of existing structures to site PV installations which also coincides with the major energy demand center in P.R.

In conjunction with assertive energy efficiency and demand response programs and battery energy storage systems and power electronics, rooftop solar or point of use solar installations can provide the bulk of the electric energy required. In a recent study titled, A Customer-focused Framework for Electric System Resilience, Silverstein, A., Gramlich, R., Goggin, M., show that the combination of power electronics in conjunction with renewable generation, demand response and BESS can provide all the services conventional generation provides. A Customer-focused Framework for Electric System Resilience, Silverstein, A., Gramlich, R., Goggin, M., Reliability Services Capabilities for Major Energy Sources. The Study indicates that voltage support: reactive power and voltage control; voltage and frequency disturbance ridethrough, frequency support: frequency stabilization following a disturbance; power electronics provide very fast and accurate power injection following a disturbance; ramping and balancing: frequency regulation, peak energy, summer can all be provided by the alternatives enumerated above.

The lack of information on the affordability of rooftop solar has thus far been an obstacle to widespread adoption of customer self-supply. UPRM faculty members have developed a small rooftop PV prototype that could be accessible to low-income residents. See ***A Case Study of Residential Electric Service Resiliency thru Renewable Energy Following Hurricane María,*** *Irizarry, A. Montano, K, Alzate, S., Andrade, F.*

Although affordable, financing options are still necessary to make rooftop solar accessible to all in PR. The local credit-union sector could be instrumental in providing small loans for acquisition of PV and BESS installations. Loan guarantees from the public sector could incentivize the credit unions to invest in PV/BESS financing. In addition, energy literacy programs are needed to promote efficiency and participation in demand response programs.

III. Contrasting Proposals for the Puerto Rico Electric System

The Action Plan in the draft IRP calls for the construction of three ship-based LNG terminals in San Juan, Mayaguez and Yabucoa and one land-based LNG terminal in San Juan, four (4) Combined Cycle Generation Turbines (CCGT) of 302 MW each in Palo Seco, Costa Sur, Yabucoa and Mayaguez, three (3) CCGTs of 38 MW each in the San Juan metropolitan area; eighteen (18) mobile 23 MW units, between 900 and 1800 MW of land-based solar projects and between 600 and 900 MW of battery energy storage systems. The Plan also proposes the conversion of several plants to burn methane gas. The construction of these utility scale projects would create long term dependence on methane gas imports, impede the adoption of rooftop solar and related options and any measure of energy democracy and self-determination in Puerto Rico.

All the gas infrastructure build-out is based on a proposed waiver of the Jones Act (Merchant Marine Act) exclusively to allow for shipping of methane gas extracted via hydraulic fracturing (fracking) from the Continental United States in foreign vessels. Certain government and fossil industry proponents such as the Resident Commissioner, the nonvoting representative for Puerto Rico in Congress and the Cato Institute are aggressively pushing for the methane gas waiver of the Jones Act. The Puerto Rico Senate also passed a Resolution requesting the Jones Act waiver and lobbied the Southern States Energy Board for the same purpose. Although the PR Senate Bill 1121 (SB 1121) is being touted as "Puerto Rico's Green New Deal", in reality the bill is aligned with

the executive branches' gas infrastructure buildout which will leave no space or resources for customer-based renewables.

Although the draft IRP references the 50% by 2040 renewable energy goal, the model chosen by Siemens Industry, Inc., PREPA's consultant only focuses on the centralized generation system, so they do not consider the optimization of distributed, customer-based energy resources (like rooftop solar) to meet future demand.

The draft IRP inserts a scenario called the Energy System Modernization (ESM) which is not based on IRP selection of the optimum energy mix but rather on "a set of pre-defined investment decisions formulated based on PREPA's advisors experience and considering its ongoing Request for Proposals (RFP) processes for new resources". This sidesteps the IRP analysis by imposing options that are not based on modeling. The ESM plan would not achieve the 50% renewable energy goal by 2040. It's also highly unlikely that the ESM heavy gas infrastructure plan would achieve the 100% renewable energy target by 2050.

The financing assumptions in the draft IRP are unrealistic. Siemens/PREPA assumes that the ambitious gas buildout is financed by third parties. A recent Institute for Energy Economics and Financial Analysis (IEEFA) study points out that PREPA's financial assumptions will likely lead to electric rates closer to the 27 cents/kWh and stifle economic development in Puerto Rico.

IV. The Public Model as the Basis for the Necessary Transformation of the Puerto Rico Electric System

The Queremos Sol platform envisions the vindication of the public utility in Puerto Rico through citizen participation and "prosumer" generation.

According to the American Public Power Association, known as APPA, public energy companies in the United States generally provide electric service at lower prices than private companies:

> Public power utilities provide reliable electric service at comparably low cost, and they do so because they are staffed by dedicated and highly qualified individuals who have years of experience. Employees of public power utilities understand their local communities and take pride in keeping the lights on for their neighbors. Many have chosen public service, and that is why they work for public power. http://c.ymcdn.com/sites/members.iamu.org/resource/resmgr/informer_2016/APPA_Pay_Report.pdf, pg.1.

The study cited, indicates that the residential rates of public energy companies were 14% lower than the rates of private energy companies known as Investor Owned Utilities (IOUs). "In 2014, public power residential rates were 14 percent lower than residential rates in IOU service territories." Id. pg.2. While in the commercial sector, the rates of public companies are a little lower and in the industrial sector they are comparable with the rates of private companies. The total rates of public companies are on average .7 cents lower than the tariffs of the IOUs. Id. pg.2.

In terms of service reliability, public electric power companies in the United States, on average outperform private companies in the industry parameters. Subscribers of public companies on average experience fewer blackouts than customers of other kinds of electric companies Id. pg.3

In Puerto Rico, private companies that generate electricity have received very generous tax exemption benefits. While PREPA has historically made contributions in lieu of taxes (CILT) to municipalities and other branches of government and provides substantial subsidies by virtue of multiple provisions of law. According to a survey conducted in 2014, private electric power companies in the US only pay 4.2% of their total operating income to state and local governments while public utilities contribute an average of 5.6% of total operating income. electricity, this is 33% more than the payments of private companies. Id. pg.4.

Public utilities provide other tangible and intangible benefits to their local communities. Public ownership of the assets provides local control over investments, energy supply options and programs. Representatives of subscribers of public companies have the right to participate in meetings where decisions are made. Planning is often done with a view to incorporating community inputs. The contributions, together with the local participation also promote local economic development. Public utilities are also innovative in terms of technology and many public energy companies have taken a leadership role in preparing their communities for the future by searching for new technologies as an integral part of community growth. They serve as sources of information in a variety of technological fields, such as environmental stewardship, high-speed Internet capacity, security and the development of community technology. Some public electricity companies have begun to offer telecommunications services, which fosters economic development because private companies cannot offer these services to smaller communities at competitive prices. Other advantages of public companies include greater efficiency of local government through the exchange of personnel, equipment and supplies. The management and operations of public companies provide additional community leadership for innovation and development. This local leadership tends to have a greater commitment to conservation, security and the environment. Local control affects special programs such as energy conservation, rate relief for certain classes of customers, the aesthetics of the electrical distribution system and design. Local control allows local resources to be linked to local needs without an economic bias towards high-cost and capital-intensive techniques or technologies. It facilitates the implementation of innovative techniques and technology to meet the energy needs of communities. The main mission of public companies is to provide a reliable and lower service

There is no guarantee that the proposed buyer (s) of PREPA's assets will not choose to generate energy based on the burning of fossil fuels. It is very likely that the private companies that choose to buy the PREPA power plants will attempt to extend their operations and will not give way to changes in generation such as energy demand response and management programs, promotion of energy efficiency and much less, renewable energy generation by ratepayers. The privatization of PREPA assets will result in Puerto Rico's energy system remaining stagnant with generation based on central station fossil fuel combustion plants.

V. The Disastrous Experience of the Privatization of Energy and Other Sectors in Puerto Rico

A. Applied Energy Systems Puerto Rico, Limited Partnership (AES)

Within the electric power sector, Puerto Rico already has several examples of generation by private corporations. The Applied Energy Systems Puerto Rico, LP (AES) plant generates approximately 17% of Puerto Rico's electric power through the burning of coal and has incurred in multiple violations and instances of noncompliance with the plant siting permit; orders and resolutions of the Puerto Rico Environmental Quality Board (EQB), violations of the Federal Clean Water Act and other violations that constitute sufficient basis for the rescission of the power purchase agreement between PREPA and AES prior to the expiration of the contract term. The most recent evidence of environmental contamination by AES is documented in a Groundwater Monitoring Study commissioned by AES to its contractor, DNA Environmental, LLC as a requirement of the Federal Coal Combustion Residuals Rule. The data indicate that groundwater in the downstream- gradient wells of the coal combustion waste, called Agremax (especially the wells designated MW-3 and MW-4) is highly contaminated with waste from the combustion of coal. When compared to upstream wells (designated MW-1 and 2), levels of coal ash contaminants are many orders of magnitude above background levels. DNA-Environment, LLC, 2017 Annual Groundwater Monitoring Report AES Puerto Rico LP, Guayama, Puerto Rico (Jan. 31, 2018). *Avaliable at*: http://aespuertorico.com/wp-content/uploads/2018/02/2017_01_31_AES_Groundwater-Monitoring-and-Corrective-Action_Annual-Report.pdf (Last visited April 8, 2019).

B. Other Private Electric Companies Operating in Puerto Rico

The Ecoelectrica methane (natural) gas combustion plant provides around 15% of the Puerto Rico's electric power pursuant to a power purchase agreement with PREPA. According to the contract, the price of energy generation above 76% of Ecoelectrica's annual capacity is linked to the price of residual oil. In addition, an affiliate of Ecoelectrica and Gas Natural Fenosa sells methane gas to the PREPA Costa Sur plant and the sales price of the methane gas to PREPA is based on a formula linked to the price of Nº6 fuel oil with sulfur content of 0.5 percent, plus an adder for transportion. The Institute for Energy Economics and Financial Analysis (IEEFA) calculates that EcoEléctrica's pricing scheme costs three to five times the price of methane gas in the United States.

Another example of private energy generation in Puerto Rico are the renewable energy power purchase agreements. Table 5-6 of the 2015 Supplementary IRP prepared by Siemens Industries lists 43 power purchase agreements totaling 1056 MW. The prices of some of these contracts are as high as $ 197.00 per MWh, in addition to requiring payment for renewable energy certificates (RECs). In addition, almost all of these projects are built or proposed to be built on agricultural land.

Similarly, a study on the privatization of the Puerto Rico Aqueduct and Sewer Authority (PRASA) concluded as follows:

[P]rivatization did not improve the quality of water services either, and certainly led to many more fines and expenses for Puerto Rico, as evidenced by the work done by the Office of

the Comptroller of Puerto Rico. Contrary to what was believed and argued by those that supported privatization of all of the water supply services, two different privatization projects, with different companies and varying contractual terms, failed. Cortina de Cardenas, Susana Maria. "Does private management lead to improvement of water services? Lessons learned from the experiences of Bolivia and Puerto Rico." PhD (Doctor of Philosophy) thesis, University of Iowa, 2011, pg.109., http://ir.uiowa.edu/etd/941.

"There is no evidence that supports the notion that privatizing any service *per se*, including water, through any kind of contract, a concession or otherwise, will lead to the delivery of better services." Id pg. 192.

VI. Conclusion

The sale of the PREPA plants and concession contracts to private investors would create incentives to perpetuate central station, fossil fuel generation and long-distance transmission that negatively impacts public health and the environment, drains the Puerto Rican economy and lacks resiliency. Furthermore, the provisions in SB 1121 that require private investors to convert all plants to burn methane gas (dual-fuel) would substitute one set of contaminants for another as documented in the expert analysis cited above and prolong dependence on imported fossil fuels, especially methane (fracked) gas from the U.S. and energy coloniality. Sustainable, technically viable and cost-effective alternatives that include the combination of power electronics, energy efficiency and demand response programs, community renewables, especially roof-top solar and battery energy storage systems are currently accessible as documented above. Puerto Rican electric customers pay the second highest rates of any U.S. jurisdictions with current rates at about 21 cents per kWh and they will ultimately pay for the transformed electric system. Federal funds and programs, such as loan guarantees for Puerto Rico credit unions and other incentives could help to achieve the necessary transformation of the Puerto Rico electric system towards a locally controlled, decentralized, clean energy system.

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[i] The Puerto Rico Energy Diversification Through Renewable Sustainable and Alternate Energy Public Policy Law (Law No. 82 of July 19, 2010), requires generation of sustainable renewable energy to be produced in Puerto Rico at the rate of twelve percent (12%) renewable energy production by 2015, fifteen percent (15%) by 2020 and 20% by 2035.