ALTERNAUTAS

(Re)Searching Development: The Abya Yala Chapter

Vol.5 – Issue 2 [December 2018]

Lily Bui

Rewiring Puerto Rico: Power and Empowerment after Hurricane Maria

Alternautas is a peer reviewed academic journal that publishes content related to Latin American Critical Development Thinking.

It intends to serve as a platform for testing, circulating, and debating new ideas and reflections on these topics, expanding beyond the geographical, cultural and linguistic boundaries of Latin America - Abya Yala. We hope to contribute to connecting ideas, and to provide a space for intellectual exchange and discussion for a nascent academic community of scholars, devoted to counter-balancing mainstream understandings of development.

How to cite:

Bui Lily. (2018), Rewiring Puerto Rico: Power and Empowerment after Hurricane Maria. *Alternautas,* 5(2), 66-78. URL : http://www.alternautas.net/blog/2018/10/29/rewiring-puerto-rico-power-and-empowerment-after-hurricane-maria

Editor : Alternautas
http://www.alternautas.net
London, UK.
ISSN - 2057-4924

LILY BUI [1]

Rewiring Puerto Rico: Power and Empowerment after Hurricane Maria [2]

Disasters unravel--infrastructures, institutions, societies, and assumptions. The 2017 Atlantic Hurricane Season brought forth multiple storms that not only stripped trees bare and dismounted roofs, but it also caught the Caribbean and Gulf Coast unprepared for the magnitude of destruction that such storms could bring, despite the best efforts of the messengers. Nearly half a year after the last hurricane season and half a year away from the onset of the next one, stories about the damage that Hurricane Irma and Maria caused have become hauntingly familiar. The stories less often told, though, are those about the long-term recovery efforts that have inevitably followed since the seas have calmed and the winds have died down.

In Puerto Rico, Hurricane Maria decimated the electrical grid, leading to subsequent failure of telecommunications systems, water filtration plants, emergency services, and economic activity. Millions of people lived without power--some for days, others for weeks, and the majority for months--and were left to rewire, arms outstretched in the dark. But Puerto Rico's rewiring encompasses more than just restoring its generators, and it extends beyond the reach of transmission and distribution lines. Hurricane Maria's sobering effects on its energy sector have demanded serious reflection on behalf of policymakers, communities, NGOs, universities, and the private companies to challenge pre-hurricane energy systems, regulatory frameworks,

---

[1] LILY BUI is a PhD candidate at the Massachusetts Institute of Technology (MIT) Department of Urban Studies & Planning. Her research focuses on disaster risk reduction planning in island communities.

[2] This article was originally published in http://www.alternautas.net/blog/2018/10/29/rewiring-puerto-rico-power-and-empowerment-after-hurricane-maria on October 29th, 2018.

ownership models, and financing mechanisms. While there is consensus that the grid infrastructure was aging and in disrepair before Hurricane Maria even hit (Koerth-Baker, 2017), and that it should be made more resilient for the future (Heister & Echenique, 2017; New York Power Authority, 2017), there is far less agreement around *how* to do it, amongst competing motivations and value systems imbricating actors within the energy stakeholder pool. The impulse to rebuild infrastructure has come in tandem with the need to attract new capital to the island, motivating the current state government to pursue a strategy to privatize the electric utility over the next year and a half (Letter to FOMB, 2018). In no simple terms, this strategy has been met with frenetic reactions, ranging from rejection to rapport.

However, in order to understand Puerto Rico's process of rewiring, one must also understand its complex (and rather circuitous) history of privatized utilities (Ayala, 2007). Further, in order to understand the restoration of the islands' power in the *electrical* sense, one must also understand the islands' constitutions of power in the *political* sense--namely, the ways in which the very processes meant to direct recovery and healing can *dis*empower individuals and groups. As a doctoral researcher who studies disaster risk reduction planning on urbanized islands, I have found myself in Puerto Rico multiples times both before and after the storm, over the course of the past three years. The following article is motivated by the watershed moment that Hurricane Maria has brought across all sectors in Puerto Rico, but most visibly, energy. Here, I attempt to make sense of the dynamic and as-yet evolving social processes behind the configuration of the future of Puerto Rico's grid. Embedded within these processes is a narrative that is as much about electrons as it is about elections, charged with myriad intentions from all fronts. *Who stands to gain* and *who stands to lose* from the decisions surrounding the grid's reconstruction remains the primary, paralysing set of questions.

Privatisation: now and then

In January 2018, Governor of Puerto Rico Ricardo Rosselló proposed a privatization model for the Puerto Rico Electric Power Authority (PREPA):

> The Puerto Rico Electric Power Authority will cease to exist as it deficiently operates today. Over the next few days the process will start, through which PREPA assets will be sold to companies who will transform the generation system into a modern, efficient, and less expensive one for the people (El Nuevo Dia, 2017).

On June 21, 2018, the governor signed a bill to officially privatize PREPA and its assets (Coto, 2018). As it stands, PREPA holds $9 billion (USD) in debt to its bondholders (Williams-Walsh, 2017). Rosselló's plan is a direct reaction to a pre-hurricane effort to restructure the utility's debt as well as the need to repair the grid after Hurricane Maria with otherwise unavailable capital. It includes a two-pronged approach: (i) selling generation assets to private investors and offering a concession for a single private operator for transmission and distribution; and (ii) combining the three commissions that currently make up Puerto Rico's regulatory board: Puerto Rico Energy Commission (PREC), the Public Service Commission for fuel and transportation, and the Telecommunications Regulatory Board (Williams-Walsh, 2017). This means that PREPA's currently vertically integrated electric utility would be broken up, sold to, and eventually managed by various actors. In addition, instead of having a dedicated energy regulator to oversee the operations and management of the electric utility, these responsibilities would fall on a single regulator for multiple utilities. The Puerto Rico Oversight and Management Board (PROMESA)[3] supports this move, indicating that privatization presents opportunities to modernize the grid, reform pensions, and renegotiate labor and contracts. PROMESA was established by a U.S. federal law to begin a process for restructuring Puerto Rico's national debt. Through PROMESA, the U.S. Congress established an appointed Fiscal Control Board to oversee the debt restructuring (Biggs et al., 2017). As I will discuss later in this article, the idea and ideology of privatization of utilities in Puerto Rico is not novel in the slightest sense. However, the pain point is this: the announcement for

[3] PROMESA was established by a U.S. federal law to begin a process for restructuring Puerto Rico's national debt. Through PROMESA, the U.S. Congress established an appointed Fiscal Control Board to oversee the debt restructuring. See DeBonis, Mike (2016). "House passes Puerto Rico fiscal rescue bill ahead of July cliff". The Washington Post.

privatization seemingly came about without public hearing, participation, or much transparency beforehand (Marxuach, 2018). Not only does lack of a public process leave out key stakeholders such as PREPA's labor unions and the electric utility's customers, it also reserves the visioning for a select group of actors behind closed doors, straining attempts at cooperation (Merchant, 2018).

Being too quick to take a normative stance for or against the governor's strategy solely on the premise of privatization does not afford the space that the idea requires to take history and context into account. Looking at the wider context of the relationship between utilities and regulators elsewhere, as well as Puerto Rico's past experiments with privatization of other utilities, further enriches the story. First, regarding the relationship between the utility and its regulator, PREPA was founded in 1941 as a government-owned utility with a monopoly on electricity transmission and a near monopoly on electricity generation (PREPA, n.d.; The Economist, 2017). As a result of New Deal policies, state-managed utilities were commonplace at the time (Tugwell, 1980). However, PREPA has essentially continued to regulate itself, without an external regulating body, until 2014 when PREC was established by U.S. Congressional Act No. 57, which stated the need to adopt "a regulatory and legal framework through the creation of a robust independent entity that will ensure the transformation of the electric power system of our Island for the benefit of present and future generations" (S. No. 57-2014). Typically, public utilities commissions on the United States mainland go hand in hand with the utilities themselves (Perez-Arriaga, 2014). For example, in the State of Massachusetts, the Department of Public Utilities oversees privately-owned utilities and makes critical regulatory decisions such as long-term planning, changes in rates, and net metering. While the relationship between utilities and their regulators is not always perfect, the fundamental existence of regulators is rarely questioned. However, PREC's very recent establishment in Puerto Rico has undoubtedly introduced a player that was not previously part of the ecosystem, inevitably resulting in tension. In addition, the energy commission does not exist in a political vacuum: the president of PREC is appointed by the governor, so perception of PREC is also shaped by partisan politics (Puerto Rico Energy Commission, 2018).

There is also a precedence for the privatization of public utilities on the islands. The Puerto Rico Sewer & Aqueduct Authority (PRASA) faced financial crisis and water quality issues in the 1990s. Declaring a state of emergency, Governor Pedro Rosselló (the current governor's father) created a strategy to privatize the water utility in order to reduce the debt and deficit and increase efficiency (Cortina de Cardenas, 2011). Consecutively, two private companies purchased and managed PRASA -- French company Veolia, then Ondeo -- resulting in increased debt, deteriorating relationships between PRASA and labor unions due to mismanagement of contracts, and incidents of water pollution. The utility once again became publicly owned and managed by PRASA in 2004, offering private contracts only for construction. Similarly, in 1998, the Puerto Rican government privatized the Puerto Rico Telephone Company (PRTC), the telecommunications utility, by selling it with twin goals of reducing the debt and increasing efficiency in the growing wireless market (Navarra, 1998).

Seemingly, the privatization of PRTC diversified the market for telecommunications in Puerto Rico, and led to improved service quality (Brown & Respaut, 2017). Claro, one of the wireless networks that emerged after the privatization of PRTC, and which also has 26% of the market share, was one of the only companies with backup power after Hurricane Maria made landfall and overall had faster recovery as a network than other wireless networks. Looking at these two conflicting cases (i.e. PRASA and PRTC), one can debunk the ideology of privatization as a panacea for debt reduction and efficiency. The PRASA case demonstrates how privatization can be executed and managed poorly. At the same time, the PRTC case indicates that immediate resistance against privatization does not necessarily correlate with long-term problems, either.

The question of renewables and alternative energy futures

The push for renewable energy alternatives has been both anticipatory of and reactionary to an event like Hurricane Maria, a watershed moment for transition. While public discourse about privatization privileges debate about ownership and

regulatory models, the question of renewables (or not renewables) competes for attention in the same vein. Currently, the majority of energy generation in Puerto Rico comes from fossil fuels (petroleum, natural gas, and coal), with only 4.2% of its energy generation coming from renewable sources like solar, wind, and hydroelectric energy (Energy Transition Initiative, 2018). Researchers and professors within the University of Puerto Rico (UPR) system have been lobbying for "distributed rooftop photovoltaic systems, solar communities, and microgrids, combined with effective demand response programs and energy storage" to push Puerto Rico toward renewable energy alternatives since before Hurricane Maria (PaRes, 2018). To be sure, renewables do not preclude privatization but the same group of researchers and professors from the UPR hold firmly that replacement of fossil fuel-based generation, if possible, would be successful if done so in sites that are "environmentally impacted and where Puerto Rico has leverage to negotiate better agreements with private investors." As it stands, with a mainly fossil fuel-based grid, electricity rates in Puerto Rico hover around an average of $0.24(USD)/kWh, below the Caribbean average of $0.33(USD)/kWh but well above the U.S. mainland average of $0.13(USD)/kWh (Energy Transition Initiative, 2018). Those pushing for renewables believe that less dependence on fossil fuels can potentially be more cost-effective (Toussie & Dyson, 2018).

Several authors from the Professors Self-Assembled in Solidarity Resistance (PaRes) at the University of Puerto Rico, in a public written testimony to PROMESA in February 2018, proposed key ideas that might provide a path toward "sustainable and resilient electric energy infrastructure," among them, "no penalty to grid defection" to prevent penalties that might be imposed to those who choose not to consume energy through traditional means; transition to distributed energy" through solar photovoltaic systems; and "transition to citizen-owned generation" in the form of fairly regulated policy frameworks that allow for new ways to manage, operate, and control the grid (Kantrow, 2017). Most importantly, the letter calls for the transition toward sustainable energy to be a social process that includes public acceptance, public participation, and public engagement. Given the existing anxieties about lack of transparency in the process of privatization, stakeholders in the energy sector have

created a space for dialogue. One such group that has organized opportunities to engage diverse actors around the future of energy planning in Puerto Rico is the National Institute of Island Energy and Sustainability (INESI), a "multidisciplinary and multi-directional institute of the University of Puerto Rico that seeks to insert the university community more effectively in the country's public energy policy and in the resolution of energy and sustainability problems" (INESI, 2018). INESI has organized various fora in which university actors and policymakers discuss past and existing energy policies, as well as possible futures for the island's grid reconstruction. The forum invites participation from actors outside of Puerto Rico as well, including researchers from universities on the U.S. mainland who specialize in energy and planning.

Off-grid energy on the island, particularly for harder-to-reach, isolated communities in the mountainous regions of Puerto Rico, has received attention after Hurricane Maria. Casa Pueblo, a community-based organization that operates as a self-supporting community center, has spearheaded solar energy initiatives both for its own facilities and for small businesses where it is located in Adjuntas. The solar panels played a significant role in post-Maria Puerto Rico, as they survived the wind and falling debris from the hurricane. Because of this, Adjuntas was one of the first places to restore power after the storm, meaning it was also able to restore critical services like health care, radio communication, and charging stations (Klein, 2018). IDEBAJO, a community-based environmental justice organization in Salinas, promotes a similar vision of solar energy futures for Puerto Rico through Coqui Solar, a project that seeks to turn Salinas into a solar-powered community by installing photovoltaic panels on the Coqui Community Center (Llorens, 2018; IDEBAJO, 2018). Casa Pueblo and Coqui Solar have been active since before the hurricane, but the storm provided a window of opportunity for raising awareness about the resilience of renewable energy sources. They are also both exemplars of community models of ownership in which the energy assets are owned and regulated by the customers and members (O'Neill-Carrillo et al., 2017). Elsewhere, proposals for community microgrid projects abound, surrounded by the rhetoric of resiliency (Wernick, 2018; Roussie & Dyson, 2018). While reflective of the ideals of public

participation and public engagement and progressive in their operationalization, these models challenge the more top-down, centralized vision of the reconstruction of the energy grid from players like PREC, PROMESA, and even PREPA. A wider discussion about how (or whether) to integrate community solar and microgrid technologies like those displayed by Casa Pueblo and Coqui Solar has not reached *crescendo*. For certain, the road ahead toward a landscape in which renewables and a privately owned electric utility can co-exist depends heavily on the ability of groups like INESI continuing to push for dialogue and critical mass both on and off-island.

Privatization is *not* necessary to achieve sustainable energy goals, but given that PREPA will inevitably become privatized by decree, Puerto Rico's energy sector must consider futures in which many renewable energy alternatives, like solar microgrids, must operate alongside a privately owned electric utility – at least for now. What must happen in tandem with planning for alternative energy resources – which initiatives like Casa Pueblo and Coqui Solar are already doing -- is the development of financing mechanisms, advocacy strategies, and diverse leadership for communities to sustain potential alternative energy resources.

Electrification of Puerto Rico and the Caribbean

In summary, Puerto Rico has had a long relationship with privatization of its utilities. This article seeks to contextualize the current discourse about privatization of PREPA and its assets within a larger history. There are cases of privatization's pitfalls as well as its successes on the island. Second, it is worth noting that there is interest in renewable energy on the island, most especially at the grassroots level. However, challenges in capacity and political support have stalled efforts to move toward more of the island's energy production being from renewable sources, despite the knowledge that renewables can be more resilient. Third, the uncertain fate of Puerto Rico's regulatory board for the island's utilities impacts how the island and its people can make decisions about its energy future.

Puerto Rico's most recent disasters have daylighted problems that long existed before the storms ever hit. However, in this critical period of recovery, the most important

thing for Puerto Rico to do is to organize – at the top and bottom – to develop a clear vision of the island's energy future, one that can be negotiated by as many stakeholders as possible. These should include government entities, NGOs, grassroots organizations, community leadership, PREPA, private energy companies, local scientists, labor unions, universities, and more. The current state of the energy sector is highly volatile and leads to short-term decision making, reduced consensus, and high uncertainty in the market (Attar et al., 2018). It is also predicated upon key principles of the neoliberal agenda, which offer few alternatives to the inevitable privatization or capitalization of utilities. This agenda is currently being challenged by smaller communities in Puerto Rico seeking alternatives to privatization with more equitable ownership and distribution of energy resources in mind.

Beyond Puerto Rico, the future of energy in the Caribbean after the 2017 Atlantic Hurricane Season is entangled in similar challenges regarding infrastructure, reconstruction, and governance at local, regional, and national scales. The next hurricane season could all too easily impact the energy systems in Antigua & Barbuda, Cuba, Dominica, Haiti, the U.S. and British Virgin Islands, Montserrat, Turks & Caicos, the Bahamas, Guadeloupe, St. Kitts & Nevis, St. Martin, the Dominican Republic, and more. Caribbean utilities are heavily reliant on diesel and have likewise struggled to create a regulatory and utility structure that will enable a transition to cleaner energy. The reliance on diesel also creates a disincentive for utilities to invest in renewables, since it would disrupt a pricing system based on fossil fuels. Many vertically-integrated Caribbean utilities do not allow for independent power producers to bid into the system (some of which include private companies), a key mechanism for integrating renewable energy resources. Community solar initiatives like the ones that have emerged in Puerto Rico point toward an energy future that deviates from older models that rely on centralized grids and perhaps offer an alternative to the Caribbean's status quo.

Understanding what happened in Puerto Rico paints a picture of what could happen again elsewhere in the region. It is important to acknowledge, too, that more than its electrical grid is in disrepair. Similar problems of governance, financing, and equity are reproduced across various sectors as the island rebuilds, among them: housing,

forestry, tourism, healthcare, education, water, coastal management, and more. Yet, the enduring spirit of Puerto Ricans is captured by a slogan that began to circulate not long after the storm subsided: *Puerto Rico se levanta*. Puerto Rico will rise. In this critical moment of rewiring comes an opportunity to bring ideas about innovative approaches for resilience into light.

References

Attar, D., Beckwith, G., Chandra, N., Neuhoff, C. & Wiltberger, C. (2018). "Organizational and Policy Needs for Microgrid Development in Puerto Rico Executive Summary." 15.708 Global Organizations Lab: Puerto Rico Microgrids Project. MIT Sloan School of Management.

Ayala, C. and Bernabe, R. (2007). Puerto Rico in the American Century: A History Since 1898. The University of North Caroline Press.

Biggs, Andrew G., Gonzalez, Arthur J., Matosantos, Ana J., & Skeel, David. (2017). "Privatize Puerto Rico's Power (Op-Ed)." Wall Street Journal. Available at: https://www.wsj.com/articles/privatize-puerto-ricos-power-1498776904. Accessed 21 March 2018.

Brown, Nick, & Respaut, Robin. (2017). Puerto Ricans desperate for cell service turn to Mexican carrier. Reuters. Avaialble at: https://www.reuters.com/article/us-usa-puertorico-slim/puerto-ricans-desperate-for-cell-service-turn-to-mexican-carrier-idUSKCN1C7236. Accessed 21 March 2018.

Cortina de Cardenas, Susana Maria. (2011). Does private management lead to improvement of water services? Lessons learned from the experiences of Bolivia and Puerto Rico (Unpublished doctoral dissertation). University of Iowa, Iowa City. Available at: https://ir.uiowa.edu/cgi/viewcontent.cgi?article=2326&context=etd. Accessed 21 March 2018.

Coto, Danica. (2018). "Puerto Rico gov. signs bill to privatize PREPA utility assets." Electric Light and Power. Available at: https://www.elp.com/articles/2018/06/puerto-rico-gov-signs-bill-to-privatize-prepa-utility-assets.html. Accessed 31 August 2018.

El Nuevo Dia. (2017). "Ricardo Rosselló announced a privatization model for PREPA." Available at: https://www.elnuevodia.com/english/english/nota/ricardorosselloannouncedaprivatizationmodelforprepa-2392103. Accessed 21 March 2018.

Energy Transition Initiative. (2017). Energy Snapshot: Puerto Rico. Retrieved from https://www.nrel.gov/docs/fy15osti/62708.pdf. Accessed 21 June 2018.

Heister, Jessica Leigh. & Echenique, Martin. (2017). "Puerto Rico's Grid Needs a Complete Overhaul." CityLab. Available at: https://www.citylab.com/environment/2017/09/hurricane-maria-puerto-ricos-grid-needs-a-complete-overhaul/540969. Accessed 21 March 2018.

IDEBAJO. (2018). https://idebajo.wordpress.com. Accessed 21 March 2018.

INESI. (2018). Available at: https://inesi.upr.edu/about.php. Accessed 21 March 2018.

Kantrow, Michelle. (2017). Energy experts present plan for PR to Judge. Retrieved from http://newsismybusiness.com/experts-present-oboard. Accessed 21 June 2018.

Klein, Naomi. (2018). "The Battle for Paradise." The Intercept. Available at: https://theintercept.com/2018/03/20/puerto-rico-hurricane-maria-recovery. Accessed 21 March 2018.

Koerth-Baker, Maggie. (2017). "Why Puerto Rico's Electric Grid Stood No Chance Against Maria." FiveThirtyEight. Available at: https://fivethirtyeight.com/features/why-puerto-ricos-electric-grid-stood-no-chance-against-maria. Accessed 21 March 2018.

Letter to the Governor from the Financial Oversight and Management Board. Feb. 5, 2018. Retrieved from https://media.noticel.com/o2com-noti-media-us-east-1/document_dev/2018/02/05/Carta%20al%20Gobernador%20sobre%20el%20Plan%20Fiscal%20de%20la%20AEE_1517874696716_10253415_ver1.0.pdf. Accessed 16 June 2018.

Llorens, Hilda. (2018). "The Making of a Community Activist." Sapiens. Available at: https://www.sapiens.org/culture/jobos-bay-community-activist. Accessed 21 March 2018.

Marxuach, Sergio. (2018). "Inconvenient Questions." Center for the New Economy. Available at: http://grupocne.org/2018/02/04/preguntas-inconvenientes-inconvenient-questions/#ingles. Accessed 21 March 2018.

Merchant, Emma F. (2018). "Puerto Rico's Utility Moves Toward Privatization, With Strained Cooperation." GreenTechMedia. Available at: https://www.greentechmedia.com/articles/read/puerto-ricos-utility-moves-towards-privatization-but-struggles-persist-in-b#gs.7TuPSDY. Accessed 21 March 2018.

Navarra, Mireya. (1998). Plan to Sell Puerto Rico Phone Company Leads to Strike. New York Times. Available at: http://www.nytimes.com/1998/06/19/us/plan-to-sell-puerto-rico-phone-company-leads-to-strike.html. Accessed 21 March 2018.

New York Power Authority. (2017). "Build Back Better: Reimagining and Strengthening the Power Grid of Puerto Rico." Available at: https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/PRERWG_Report_PR_Grid_Resiliency_Report.pdf. Accessed 21 March 2018.

O'Neill-Carrillo, E. Santiago, R., Méndez, Z., Vega, H., Mussa, J. Rentas, J. (2017). "Capstone Design Projects as Foundation for a Solar Community," Proceedings of the 47th ASEE/IEEE Frontiers in Education Conference, October 18 - 21, 2017, Indianapolis, IN.

Pérez-Arriaga, I. J. (Ed.). (2014). Regulation of the power sector. Springer Science & Business Media.

PaReS. (2018). Public letter to Honorary Judge Laura Swain, July 30, 2017.

Puerto Rico Electric Power Authority History. (n.d.). Available at: http://www.fundinguniverse.com/company-histories/puerto-rico-electric-power-authority-history. Accessed 21 March 2018.

Puerto Rico Energy Commission. (2018). Jose Roman, Interim President. Available at: http://energia.pr.gov/en/staff-member/jose-h-roman-pe. Accessed 21 March 2018.

S. No. 57-2014. Available at: http://www.oslpr.org/download/en/2014/A-057-2014.pdf. Accessed 21 March 2018.

The Economist. (2017). Be PREPA-ed: The story of Puerto Rico's power grid is the story of Puerto Rico. The Economist. Available at: https://www.economist.com/news/united-states/21730432-even-hurricane-maria-hit-it-was-mess-story-puerto-ricos-power-grid. Accessed 21 March 2018.

Toussie, Isaac & Dyson, Michael. (2018). "The Role of Renewable and Distributed Energy in a Resilient and Cost-Effective Energy Future for Puerto Rico." Rocky Mountain

Institute. Insight brief. Available at: https://www.rmi.org/wp-content/uploads/2017/12/Insight_Brief_Puerto_Rico_Resilient_CostEffective_Energy.pdf. Accessed 21 March 2018.

Tugwell, F. (1980). Review: Energy and political economy. Comparative Politics, 13(1), 103-118.

Wernick, Adam. (2018). "Renewable energy and resilient microgrids could help rebuild Puerto Rico." Public Radio International. Available at: https://www.pri.org/stories/2017-10-26/renewable-energy-and-resilient-microgrids-could-help-rebuild-puerto-rico. Accessed 21 March 2018.

Williams-Walsh, Mary. (2017). "Puerto Rico's Power Authority Effectively Files for Bankruptcy." New York Times. Available at: https://www.nytimes.com/2017/07/02/business/puerto-ricos-electric-power-authority-effectively-files-for-bankruptcy.html. Accessed 21 March 2018.