Multi-sectoral perceptions toward a sustainable energy transition in Puerto Rico: Implications for the Post 2017 Atlantic Hurricane Season

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OVERVIEW

Puerto Rico undergoes an energy transition catalyzed by a financial crisis and the disastrous 2017 Atlantic Hurricane Season. After Hurricane Maria hit there is a pressure to build back “better” as soon as possible; however, the recovery process cannot only be assessed by the system’s ability to absorb the shock and maintain its previous state, but also by the degree to which the system increases its adaptive capacity to more frequent atmospheric events in Puerto Rico. Transitioning away from fossil fuel dependence will require not only substantial financial investment but also institutional support and political will that have a role in energy policy and the decision-making process. Post-disaster major reconstruction can be that unique opportunity to leverage technology innovation and social awareness to create a thriving and more sustainable future for the Puerto Ricans.

This qualitative research summarizes stakeholders’ visions for the Archipelago’s energy transition using data collected over two years (2015-2016). It describes shared values, barriers and opportunities identified before the Hurricanes Irma and Maria plummeted the power grid. This research suggests that there is an opportunity to explore options that go beyond merely building back the power grid. The result of this study could nourish the constructive dialogue and conscious decision-making towards a sustainable energy transition. Indeed, deliberation is more of a process than an outcome, and it is more effective without the time constraints. Understanding the “visions of the future” that stakeholders held before the hurricanes Irma and Maria is a reference point to scrutinizing the pathway to the future electric system build.

WINDOW OF OPPORTUNITY

Neither climate change effects nor the instability in fossil fuel prices pushed Puerto Rico towards more sustainable forms of energy generation at the level of commitment required. Even though Puerto Rico does not produce fossil fuels, 98% of the electric mix used to power the grid relies on a combination of oil (47%), natural gas (34%) and coal (17%); and the existing electrical infrastructure and technological capabilities were built around fossil fuels. The infrastructure and technological capabilities were built around fossil fuels. This distribution system offers a window of opportunity for a sustainable energy transition but these time windows require having a vision in place when the economic investment is available. While the power plants in Puerto Rico suffered minor damages due to the Hurricanes Irma and Maria, key transmission lines and most of the distribution grid went down causing a cascading effect where all essential services were severely compromised.

PRE-DISASTER PUERTO RICO’S ENERGY ARENA

Public deliberation during pre-disaster or “normal times” can accelerate the ability of institutions and stakeholders to make timely decisions to maximize recovery efforts toward sustainability. The purpose of this multi-method study was to examine stakeholders’ visions, values, and perceived barriers, and opportunities for a sustainable transition in Puerto Rico before the 2017 Atlantic Hurricane Season. Two data sources are the core of this analysis, 1) the working documents done in the Energy Stakeholders Forum, and 2) thirty-one semi-structured interviews with key stakeholders in the Puerto Rico energy policy arena.

Three central visions that emerged from the analysis of the semi-structured interviews are the “Renewal of energy sources,” “Distributed energy generation,” and “Community-based grids.” Most interviewees strongly believed that transitioning away from current fossil fuel sources is vital for the sustainability of the energy sector (Table 1). Most of the participants believed that distributed energy generation and community-based grids are the best pathways to introduce resilience in energy Puerto Rico. Twenty-four values were identified across stakeholders and sectors (Table 2). The primary values to which the interviewees agreed to were summarized as “renewable,” “sustainability,” “environment,” “economic,” “Liberty,” and “reliability.” The primary barriers for energy transition are non-technical and dominant ones include governance, mindset and behavior patterns, major economic interests, and resource mismanagement (Figure 1). Combined results suggest that opportunities are perceived as community empowerment, better resources management, market expansion, and education (Figure 2).

The Energy Stakeholders Forum (ESF) is a series of meetings to promote multi-sectoral dialogue about energy issues and to identify research needs for decision-making. The ESF officially started by a partnership between the National Institute of Energy and Island Sustainability (INESI, for its Spanish acronym), the Puerto Rico State Office of Energy Public Policy (CEPEE, for its Spanish acronym), and the National Campus of the University of Puerto Rico-Mayaguez (UCPRM). This dialogue process offers a window of opportunity for a sustainable energy transition but these time windows require having a vision in place when the economic investment is available. While the power plants in Puerto Rico suffered minor damages due to the Hurricanes Irma and Maria, key transmission lines and most of the distribution grid went down causing a cascading effect where all essential services were severely compromised.

The interviews were part of the CRISP Project - Critical Resilient Infrastructure Systems and Processes - sponsored by the National Science Foundation. The objective of these interviews was to identify stakeholders’ perceptions of the island’s electrical system. There were 31 semi-structured interviews conducted which included the following sectors: Energy Regulatory Authority, Executive Branch, Government, Multi-Technical Assistance and Energy Sector, Renewable Energy Companies, NGOs, Academia, Federal Government, Professional Organizations, Labor Unions, Environmental Organizations, and Community Leaders. All interviews were recorded, transcribed, and imported into NVivo 12 for content analysis.

TABLE 1: Meta-matrix - summary of visions by stakeholder id and sectors

<table>
<thead>
<tr>
<th>Vision</th>
<th>Values</th>
<th>Barriers</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable</td>
<td>Environment</td>
<td>Economic</td>
<td>Community Empowerment</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Liberty</td>
<td>Reliability</td>
<td>Better Resources Management</td>
</tr>
</tbody>
</table>

TABLE 2: Meta-matrix - summary of values by stakeholder id and sectors

<table>
<thead>
<tr>
<th>Value</th>
<th>Stakeholder Ids</th>
<th>Sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable</td>
<td>All stakeholders</td>
<td>Energy, Environment, Economic</td>
</tr>
<tr>
<td>Sustainability</td>
<td>All stakeholders</td>
<td>Energy, Environment, Economic</td>
</tr>
<tr>
<td>Environment</td>
<td>All stakeholders</td>
<td>Energy, Environment, Economic</td>
</tr>
<tr>
<td>Economic</td>
<td>All stakeholders</td>
<td>Energy, Environment, Economic</td>
</tr>
</tbody>
</table>

FIGURE 1: Barriers for a sustainable energy transition

FIGURE 2: Opportunities for a sustainable energy transition

REFERENCES


ACKNOWLEDGEMENT

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Background photo: Solar panels in Las Piedras, Puerto Rico by Dennis M. Rivera Pichardo.