

Enhancing resilience through community grassroots energy innovation and social value creation

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In the island there is a collective imaginary that Puerto Rico should adopt solar, **communities are finding local and grassroots strategies to make this possible**, we want to partner with them and **create solutions together**.

Hurricane Maria and Post-disaster Inter-University Engagement

(cont.)

The idea of a different kind of PhD that **recruits students and pursue research that builds back to communities**.

Inter-university engagement and partnership:
Arizona State University (ASU) and University of Puerto Rico at Mayaguez (UPRM) exchanged students to pursue graduate and undergraduate programs.

Present

Research collaboration and capacity building:
The Center for Energy and Society at ASU in collaboration with National Institute for Energy and Island Sustainability (INESI) at UPRM, started researching and exploring strategies for creating sustainable energy innovation for Puerto Rico.

Y1

Creating **pathways for multiple collaborations** and extended peer communities.

Applied, Action and Impact Oriented Research Opportunities:

Started Collaborative Research Project
Building an **Energy Research Alliance** for Puerto Rico's Future

- ASU
- UPRM
- NREL
- DOE
- Communities

Y2

Co-CREATE Sustainable and Resilient Futures with Puerto Rico Communities

- Working shoulder to shoulder along with 4 Partner Communities to:
 - Analyze local energy-poverty nexus dynamics
 - Identify opportunities for creating new social value
 - Imagine and design solar solutions that enhance resilience and promote local economic development and social wellbeing

(cont.)

Impact:

Engage with **communities**, leaders, policymakers, industry members, and other stakeholders in ongoing analyses and discussions of the value of solar energy for low income communities in Puerto Rico.

Plan and simulate **Community Energy Solutions**

Disseminate **findings** to project developers and funders, government officials, and other relevant stakeholders.

Disseminate **curriculum for community solar energy planning training**

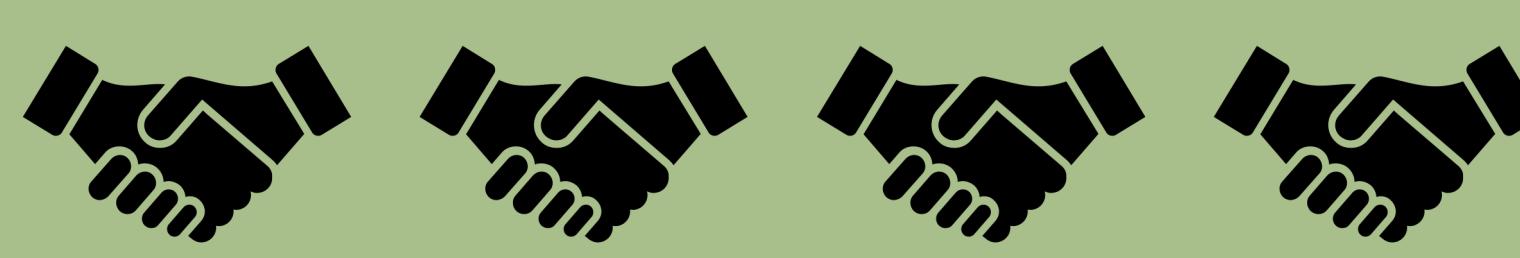
Three years research agenda:

Our multilayer design framework explores how options for socio-technical change featuring **more inclusion of solar energy can lead to greater social benefits** at the nexus of energy and poverty. The research agenda and design process reflect the expertise of an interdisciplinary research team, incorporating social value creation, energy system disruption and innovation, legal and policy change, post-disaster politics, justice, climate resilience and adaptation, and institutional and political aspects of markets and governance in Puerto Rico.

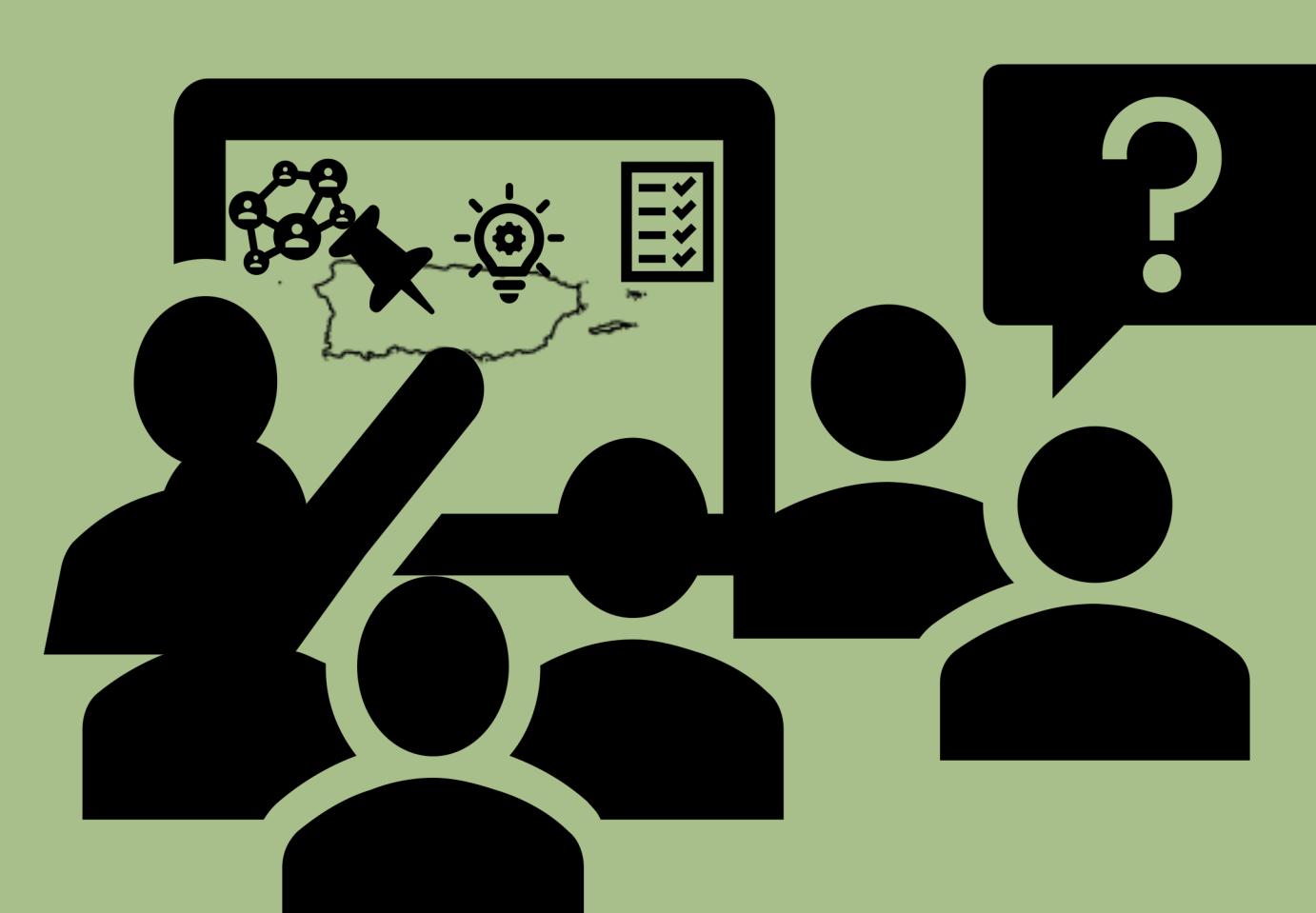
Evaluating solar potential, markets and policy in Puerto Rico.



Research collaboration on energy poverty nexus in four low income **communities**.

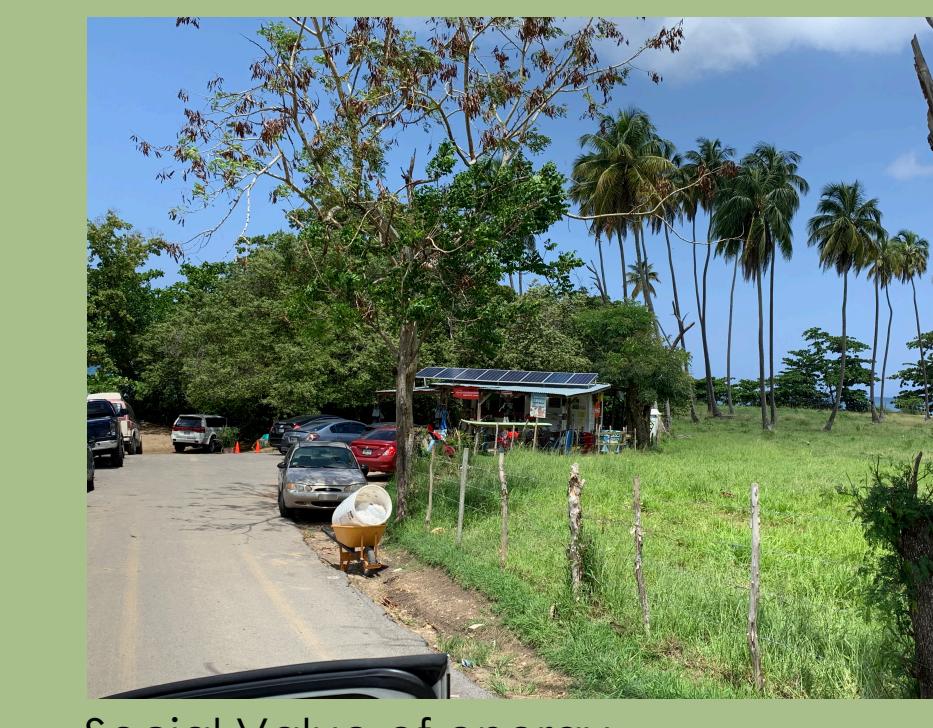


Conduct and evaluate **community solar energy planning processes** in each research site. Use the results to evaluate the effectiveness of solar energy solutions for low-income communities in Puerto Rico



Challenges we are focusing:

Human built **environment** and **systems** are vulnerable in multiple levels and domains. **Climate change** is increasingly showing us how vulnerable we are.



Everyone on the island was exposed to the same atmospheric event and **in the aftermath some sectors were affected more than others**. In the case of electricity service restoration, it varied from months to more than a year. While energy is not the only issue that contributed to the disaster, it is associated with all of them.

People from different communities and organizations across the island had to put their hands at work to rebuild energy infrastructure services. **In the way, they are creating new forms of organization but also repeating patterns that maintain and replicate same oppressive structures.**



Nonprofit organizations along with education institutions, businesses and communities have organized in an effort to develop solar energy solutions. This is **changing the energy landscape at multiple scales**.



Solar energy became an alternative in the Puerto Rican imaginary and the adoption for solar energy technologies is increasing in unprecedented ways.



Island energy infrastructure was not being maintained before the hurricane and mostly reconstruction and minor improvements have occurred after the hurricane. **The energy grid today is as vulnerable as it was before hurricane María.**

Two years have passed and there has been slow progress in the development of solar energy in the island. **Still there is no clear vision on what the island energy future will look like.**