To achieve these innovations, we will build upon our prior experiences with open source software development, empirical software engineering, energy challenge game design, power systems for renewable energy sources, environmental planning, and community ecology. We will build upon established relationships with University of Hawaii organizations (Renewable Energy and Island Sustainabity Group, Sustainable UH) and community organizations (Kanu Hawaii, Blue Planet Foundation, Hawaiian Electric Company). Hawaii is an EPSCOR state and approximately 84% of University of Hawaii undergraduates are minorities, so this research will benefit under-represented populations.

The project will create a interdisciplinary community of researchers including professors, graduate students and undergraduates from computer science, electrical engineering, and urban and regional planning. Through the development of graduate seminars and open source repositories, we will pursue workforce development related to power quality, crowdsourcing, user interface design, community development, and the Smart Grid.

This research creates a mechanism for rapid implementation and deployment of community-based power quality monitoring. While Hawaii is the ideal location to develop this capability due to its nation-leading penetration of distributed renewables and current consumer dissatisfaction, we might not be an outlier: according to a report by the North Carolina Clearn Energy Technology Center, rooftop PV is now cheaper than utility-supplied power in 42 of America's 50 largest cities [33].

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