Advanced Learning for Energy Risk Tracking-ALERT

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Vision: Recent statistics indicate that despite all the measures taken by the utility industry to maintain reliability and security of the energy supply, the number of major electricity blackouts worldwide is increasing. **A**dvance **L**earning for **E**nergy **R**isk **T**racking (**ALERT**) predicts the risk of outages and shares it with the utility company and its customers to mobilize mitigation measures.

Community-identified problem: Currently, the utility company customers are unaware of the risk of loss of electricity and serve a passive role in mitigating impacts. ALERT changes the practice by predicting the risk and engaging customers in a partnership with utility to mitigate and mitigate the impacts.

Intellectual Merit: Predicting the risk of electricity outages and mobilizing consumers to mitigate the impacts for an improved community resilience requires an integrative research across smart grid fundamentals (SGF), advanced data analytics (ADA), and social, behavioral and economic (SBE) sciences. ALERT predicts risk using ADA, learns consumer behavior through SBE sciences interventions, and deploys SGF to manage the outage risks.

Project Activities: ALERT project activities are focused on three goals: a) consolidate the research team understanding of the problem to be able to devise the best integrative research methodology to address the hypothesis and find widely-acceptable solutions, b) engage community stakeholders across variety of groups together with the utility and city staff to assure the best research strategy and pilot arrangements, and c) develop education and training across K-20, and community and business outreach to assure the future workforce is racially diverse, socially engaged, and consist of underrepresented and underserved groups. We conducted stakeholder meetings and individual interviews to assure proper planning to achieve mentioned goals.

Broader Impact-immediate: Through intensive interactions with stakeholders we recognized that residential and commercial consumers are the most vulnerable and identified representative groups that are willing to engage in the pilot study.

Broader Impact-long term: While we have been focused on defining longer term impact a recent outage in Texas caused by the storm Uri that has left 4.5M consumers with no electricity and over 7M without water for several days demonstrated the devastating impacts.

Next steps: Initially, we identified two major cities in Texas as potential candidate communities for the pilot study. After the stakeholder interactions, we concentrated our efforts on the City of San Antonio and the local utility company CPS Energy as being the pilot hosts.