Hacking for Energy
Industry Host Problem Statement Submission Form

Use this form to submit a problem statement for the Spring 2017 Hacking for Energy course. Students will pick the projects they want to work on by reviewing problem statements submitted by the Industry Hosts. Industry Hosts are allowed and encouraged to submit more than one problem statement.

What makes a Hacking for Energy problem statement great? A great Hacking for Energy problem is one that a team of four students from different disciplines can really sink their teeth into, leveraging a broad technical background with limited energy expertise. The problem should also have an achievable scope, something that can conceivably be tackled within the course's 13-week timeframe.

Name:	**Company/Organization:**
Problem Title:	
Challenge: *Write a one to two-sentence description of the challenge.*	
Background: *This should be one to two paragraphs, providing a general description of the problem to be solved and why this problem is important.*	
Boundaries and Considerations: *This will help the students understand under what parameters their solution will be used.* • *Describe technical thresholds that may be desirable (do not write requirements).* • *Environmental conditions to consider* • *Technologies that might be relevant* • *Other clarifying information*	

See other side for an example problem statement

Hacking for Energy
EXAMPLE Problem Statement

Name: Dana Doe

Company/Organization: Utility X

Job Title: Director, Demand Response Program

Problem Title: Increase residential participation in demand response.

Challenge:

Residences represent a large load on the grid and are currently unable to participate in demand response programs that would help reduce peak loads and lower electricity costs for all.

Background:

Many utilities offer demand response programs to commercial and industrial customers as a way of reducing the peak load they are required to provide. With these programs, utilities will assess the predicted load days, hours, or even minutes in advance. If they are getting close to their peak capacity, they will call participants in the demand response program and ask them to shut certain equipment down in order to reduce the total energy demand on the grid. Participants that comply will be compensated by the utility for the electricity they did not use.

These types of demand response programs have not been extended into the residential market. However, residences consume less energy, so many of them would need to participant in order for the utility to see a significant enough load reduction to avoid a brownout or blackout. Recruiting this number of participants presents a marketing challenge to the utilities. Additionally, once someone has agreed to participate, communicating en masse to the homeowners when and how much energy they would have to conserve also presents a challenge, as currently utility workers make personal phone calls to demand response participants detailing what they need to turn off and when. Finally, the utility would also need a system for verifying that the homeowners have complied and calculating their compensation in a transparent way.

Boundaries and Considerations:

- The residential market includes both multi-family and single-family establishments
- Only X% of customers in NYC have smart meters
- Homeowners are often not around during peak usage times (~3PM during the day in the summer), so they are often not around to physically turn things off themselves
- Utilities often have a number of incentive programs that customers are not currently aware of

See other side for the *Problem Statement Submission Form*