2015 Team Update Webinar

e⁻Lab Accelerator

A Boot Camp for Electricity Innovation

Webinar Agenda

- Introduction/Webinar Logistics – ***5 Minutes***

- Team Updates – ***40 Minutes (5 Minutes/Team)***
    - Clean Energy for Us Update – Katie Bray
    - Energy Independent Bloomfield Update - Chris Ball
    - Hoboken Microgrid Development Update - Caleb Stratton
    - Iberdrola Smart Energy Community Update - Scott Bocheneck
    - Juneau Transportation Electrification Update - Alec Mesdag
    - Ketchum Energy Resilience Update - Aimee Christensen
    - Minnesota e21 Initiative, Phase II Update - Rolf Nordstrom
    - Solar + Storage for Resilience Update - Cal Broomhead

- Q&A – ***15 Minutes***

Objectives for Webinar

- Provide an update on Accelerator 2015 project progress
- Detail and discuss questions and challenges Accelerator 2015 project teams have been dealing with
- Highlight successes that Accelerator 2015 projects have achieved

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Webinar Logistics

- All participants are on mute
    - If presenting, your mic will be unmuted during your introduction
    - Please submit questions via “Questions” window in your control panel
- Please use only <u>one</u> audio option
    - Using both telephone and computer audio systems can cause interference and poor audio quality
- We are recording this webinar for future reference
- For any technical difficulties during the webinar, please email:

Courtney Fairbrother
cfairbrother@rmi.org

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2015 Accelerator Project Team Updates

Clean Energy for Us

Katie Bray, Director, Clean Energy for Us

Project Status on Final Day of Accelerator 2015

Ready to tackle the next phase of building a long-term business to radically transform the residential clean energy markets in the Southeast.

We identified four mechanisms needed to scale Clean Energy for Us in 2016:

1. A Board of Directors
2. Additional staff
3. A revised revenue structure
4. A 3-year business plan

Progress and Activities Since Accelerator

Post-eLab activities:

- Recruited three Board Members
- Phased in a new revenue structure
- Secured and budgeted operational funds
- Finalized Funder's Brief w/ detailed budget & strategic plan for 2015
- Created and executed an exit strategy
- Advised and shared best practices with new energy campaigns

Impact:

- Average monthly sales more than doubled
- Net income grew by 83%
- 68 new clean energy projects in NC (commercial, residential, and nonprofit)
- Six new energy campaigns in NC, GA, SC, and NY

Project Status Now and What's Next

Project Status: "lifestyle" exit strategy

1. Stopped reinvesting in the business
2. Helped find placement for existing employees
3. Repaid investors
4. Cashed out and currently finishing up dissolution
5. Transitioning CE4U assets and network to other organizers in NC

What's next?

1. Surveying contractors to collect market research and determine best practices
2. Consulting for organizations in NC, NY, GA
3. Supporting Sun Valley Institute for Resilience's energy efforts in ID
4. More market research w/ CE4U data

Energy Independent Bloomfield

Chris Ball, Energy Efficiency Director, City of Bloomfield

Project Status on Final Day of Accelerator 2015

The team set the following goals for the 12 months following accelerator

- Lobby for biomass pilot and capital projects on as demonstrations
- Select electric energy provider
- Hire energy efficiency director
- Create energy coordinator action plan and VISTA action plan
- Schedule 1-on-1 meetings with City Council members
- Start the community planning/visioning process
- Establish one list of all projects that Bloomfield has accomplished
- Create an inventory of sustainable indicators and monitor progress in each area

Progress and Activities Since Accelerator

Since Accelerator we've made significant strides on our 12 month goals. In addition, we've created new initiatives, built collaborative relationships throughout the country and expanded our vision.

Some highlights:

- The city hired an energy efficiency director within 2 weeks of Accelerator.
- Bloomfield was named as one of 10 Operation AmeriCorps communities, bringing 8 full-time service members to the community to work on energy efficiency.
- The city negotiated a new wholesale electric contract that permits the city to invest in solar or other renewables.
- Collaborated with the Environmental and Energy Study Institute (EESI) to create a pilot on-bill financing program for energy efficiency.
- Held 2 county wide meetings to develop a community vision with an energy independence focus.

Project Status Now and What's Next

Our new wholesale electric contract included a rate reduction. The reduction will provide some opportunities to make investments. Of course when funds become available everybody wants a piece. One of our challenges is to decide which investments do the most to achieve long-term goals.

- How do we build consensus around what our long-term goals are?
- How do we determine which investments to make with our limited available capital.
- How much risk do we take?

We've come a long way since March. But we have a long way to go. We are in the process of developing a community energy plan. But, the path to success is not always self-evident.

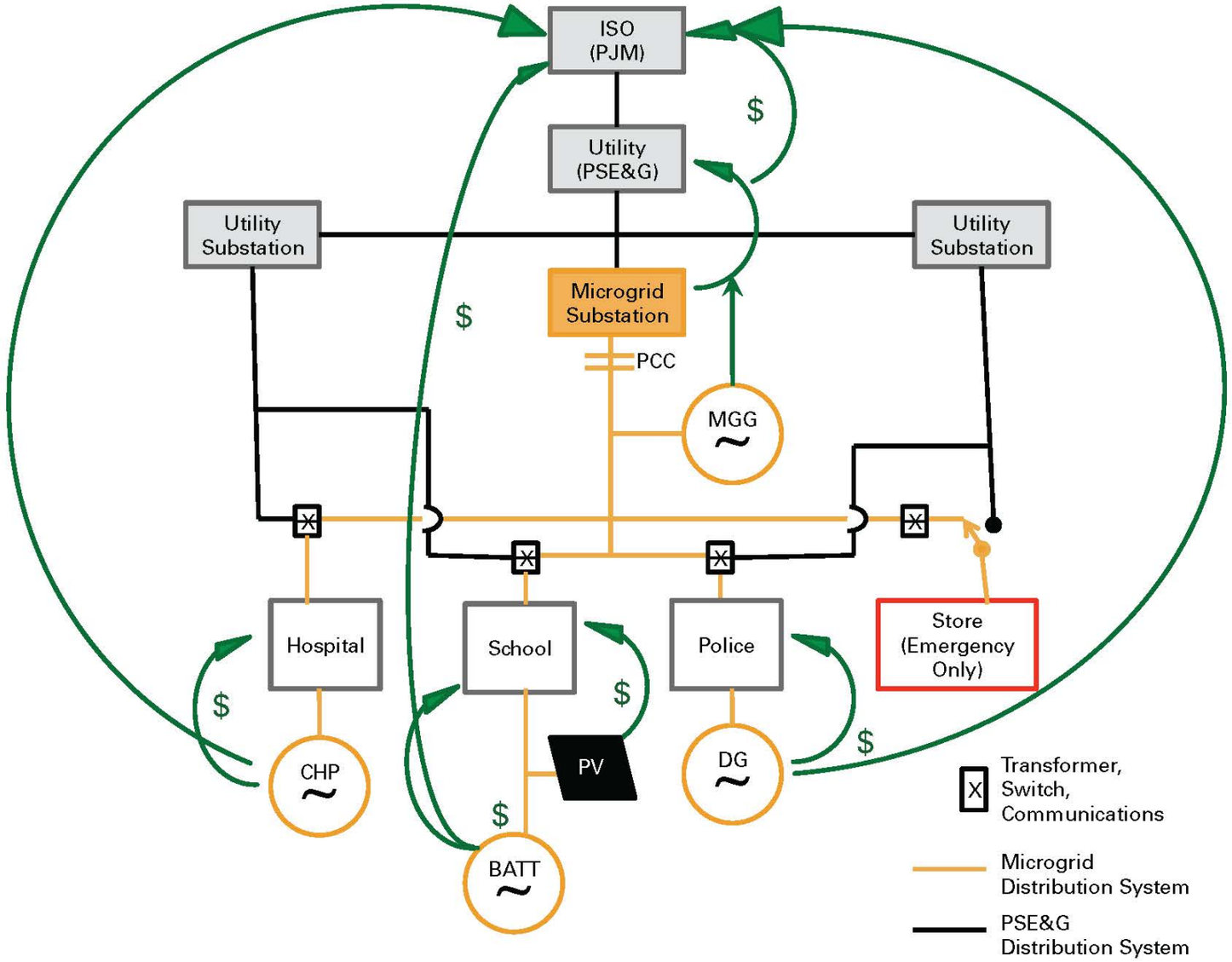
Hoboken Microgrid Development

Caleb Stratton, Principal Planner, City of Hoboken

Project Status on Final Day of Accelerator 2015

The Hoboken Microgrid Business Model

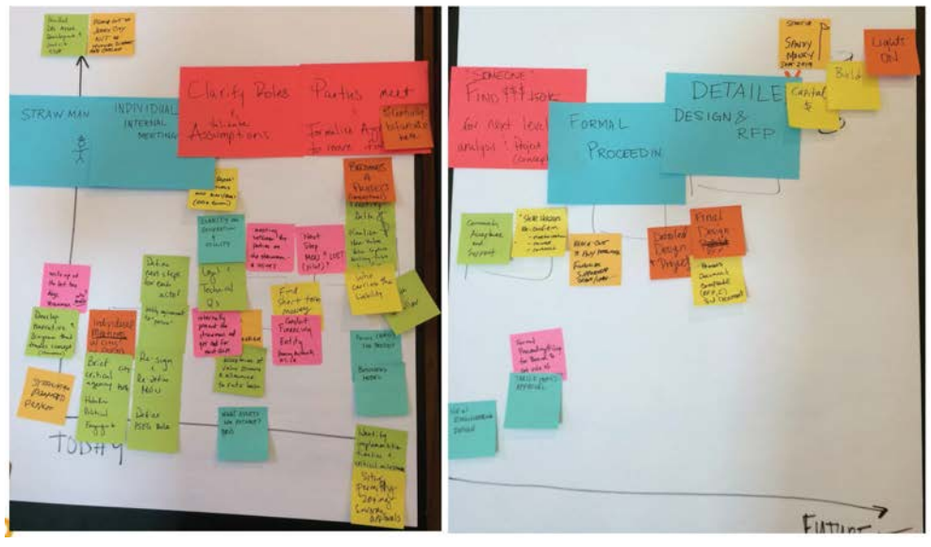
While at e-Lab Accelerator, the team developed a microgrid business model for Hoboken that could be feasible within the current regulatory environment, and creates various opportunities for PSE&G to play a role in the development and operation of the microgrid. (Note: Several assumptions about this business model will need to be validated by PSE&G and/or the NJ BPU).



Progress and Activities Since Accelerator

1) Regulator, Utility & Sponsor Consensus

2) Actionable Next Steps & Project Timeline



3) New Partnerships & Regional Support

MICROGRIDS MADE EASIER

Why a Microgrid?

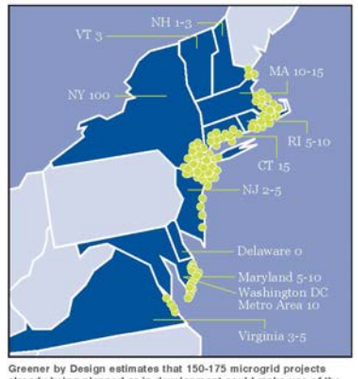
In October 2012, Superstorm Sandy devastated the city of Hoboken: 500 million gallons of brackish water flooded its streets, homes and infrastructure (seventy percent of the city sits in a flood zone). Ninety percent of the city lost power, a dire situation that lasted for almost two weeks, making it an extremely stressful time for both residents and city administrators. The storm damaged critical infrastructure, hampered emergency response teams and left citizens cut off from key resources. Sandy sent a woefully clear message that Hoboken needed to enhance its resiliency before the next big storm.

Vowing "never again," Hoboken Mayor Dawn Zimmer conceived of establishing a self-contained microgrid for the City of Hoboken. The initial goals were to improve energy availability during emergencies, reduce pressure on the main power grid during peak hours and decrease emissions through the adoption of renewables. The city received a technical assistance grant from the Department of Energy to fund the initial analysis for the microgrid project. Brought in to do the analysis, Sandia National Labs identified 55 buildings – including police stations, fire departments, pharmacies, senior facilities and low-income housing – crucial to receive back-up power through a microgrid.

The Problem: Complex Barriers

Hoboken had enlisted Greener by Design, a private firm, as an energy consultant, and Senior Project Manager Gail Lalla was tasked with turning the idea into a reality. Lalla sensed that to fully engage all the necessary stakeholders – time-strapped people without much experience implementing microgrids – an organizational tool would be crucial to make the job easier. She also recognized that not all microgrids are clean microgrids, so the tool would need to explain the benefits of this forward-looking approach. Greener by Design's goal was to ensure that a microgrid could become sustainable over time, if not from the start. Lalla faced the thorny challenge of making a case for the future cost efficiency of renewables in the face of up-front costs and a complicated path to monetizing environmental and social benefits. Thus, the seeds of the Resilient Microgrids Toolkit were sown.

About the City of Hoboken Incorporated in 1849, the City of Hoboken lies on the west bank of the Hudson River across from the island of Manhattan. Originally, Hoboken was developed as a waterfront resort town, and its spacious meadows were actually the location of the first organized baseball game. Because of its waterfront location, Hoboken has historically been a transportation hub and has drawn immigrants from a variety of different cultures. Covering just over a square mile and home to more than 50,000 residents, the city is densely populated and is one of the most walkable and transit-friendly cities in America.



Greener by Design estimates that 150-175 microgrid projects already being planned or in development could make use of the Resilient Microgrids Toolkit.

The Solution: A Simple Toolkit

To create the toolkit, the City of Hoboken and Greener by Design enlisted the help of EDF Climate Corps, a program that trains and embeds graduate students within organizations to accelerate energy projects. EDF Climate Corps fellow Devashree Ghosh, a recent graduate of The New School who had previously worked on a cost-benefit analysis of the Hoboken microgrid, was the perfect candidate to focus on this project over the course of a summer fellowship.

Ghosh began her project by conducting a series of interviews. She wanted to determine which specific stakeholders would primarily use the toolkit, in what ways the toolkit could make the most impact and how the toolkit could scale and adapt to different buildings or other communities. She interviewed energy services companies, policy advisors and experts at Greener by Design and EDF to gain as much information as possible.

In order to develop a tool that specifically addressed Hoboken's needs, Ghosh then met with Stephen Marks, the municipal manager, and Caleb Stratton, the principal planner, to determine their priorities. In their opinion, a successful toolkit would need to:

- Benchmark different microgrid projects against each other
- Provide a scoring mechanism for benefits
- Prioritize energy efficiency

Project Status Now and What's Next

Status

Awaiting State of New Jersey Energy Masterplan Update
Release of Board of Public Utilities microgrid policy

Next Steps

Refining Upper Bound and Lower Bound Solution sets to match minimum generator performance measures.

Challenges

Project contingent upon Regulator and Utility cooperation and coordination. Not a challenge per se – just a realistic ceiling that impacts feasibility and timeline of implementation

Iberdrola Smart Energy Community

Scott Bochenek, Manager, Smart Grid Programs, Iberdrola USA

Project Status on Final Day of Accelerator 2015

- The Energy Smart Community was still in the preliminary planning stage at Accelerator
- The Accelerator workshop shaped the way we think about how a utility collaborates with community stakeholders
- We framed the opportunity as “The utility as enabler of community energy goals”
- The team built strong relationships that has allowed for continued collaboration

Progress and Activities Since Accelerator

Since Accelerator….

- The Accelerator team has continued to meet on a regular basis
- Additional collaboration with community stakeholders
- Iberdrola USA filed the Energy Smart Community proposal with the NY PSC
- Community Energy Coordination demonstration project was created and filed…Implementation is currently underway…
- Flexible Interconnect demonstration project was created and filed… Implementation is currently underway…
- Tompkins County is finalizing its Energy Roadmap

Project Status Now and What's Next

- We will soon begin a collaborative process to create the Energy Smart Community implementation plan
  - Iberdrola USA, NY DPS, Community Stakeholders

- Upon approval, 12,000 smart meters will be installed
  - Focus on testing new rate designs and the value of data to engage customers and enable opportunities
  - Other areas of focus include:
    - Integrated System Planning
    - System Modeling
    - Network Opperations
    - Market Animation

- Community Energy Coordination and Flexible Interconnect demonstration projects will be implemented over the next 24 months

Juneau Transportation Electrification

Alec Mesdag, VP & Director of Energy Services, Alaska Electric Light & Power

Project Status on Final Day of Accelerator 2015

Our team left accelerator with the understanding that we need to remain cognizant that the technological solutions to our transportation needs may not materialize as one-for-one replacements of the system we have in place today.

As we have a goal to replace passenger miles powered by fossil fuels with renewable hydroelectricity, a key question we left with is how to make progress now when many of the technologies we need may not exist today.

We also left Accelerator with the awareness that much of the information we needed to make effective decisions was not readily available.

Progress and Activities Since Accelerator

Much of the progress since Accelerator hinges around providing additional information about the potential for electrified transportation in Juneau, not just in passenger vehicles, but for transit buses, tour coaches, and marine applications.

We managed to finally collect a small bit of information from Alaska DMV about the number of electric vehicles in Juneau, which will help us gauge the rate at which people are adopting them over time.

We also held a successful National Drive Electric Week event with a high percentage of the electric vehicles in Juneau taking the time to bring their vehicles out on a rainy Saturday for this picture.

Project Status Now and What's Next

In perhaps the greatest sign that our project will succeed despite us, we see a great deal of progress happening on its own. A local tour company arranged to have a BYD bus shipped to Juneau for the Alaska Travel Industries Association convention held in Juneau this year. Many local leaders were able to take a trip to the glacier on the bus and we hope to see more of them. Some of the impetus for that effort was driven by new scoring criteria for operators hoping to take visitors to the Mendenhall Glacier Visitor Center, which now is heavily weighted to favor companies pursuing cleaner transportation options.

Ketchum Energy Resilience

Aimée Christensen, Executive Director, Sun Valley Institute For Resilience

Project Status on Final Day of Accelerator 2015

Project framing, objectives and roles were clarified among participants including city, major power consumer, utility.

Information needs were identified:

1. **Inventory**: Existing back up, critical loads, etc.
2. **Generation**: Feasibility of solar, biomass, biogas, geothermal
3. **Grid**: Redundant transmission details incl. costs and benefits to goals
4. **Micro-grid and storage**: Costs and technology options

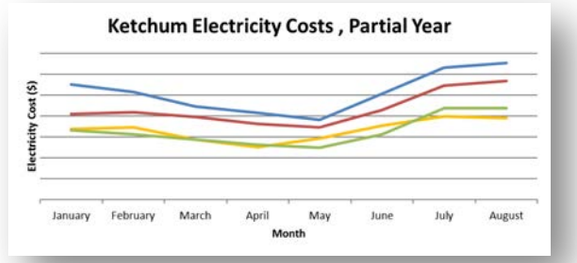
Agreed on need to build scenarios for 4 levels of reliability including technology and financing solutions:

- **Critical loads**
- **Critical loads plus property protection (freezing)**
- **Summer peak (12+ MW)**
- **Winter peak (50+ MW)**

Progress and Activities Since Accelerator

1. Inventory

- Conducted analysis of four years of Ketchum electricity usage and cost by location



2. Generation

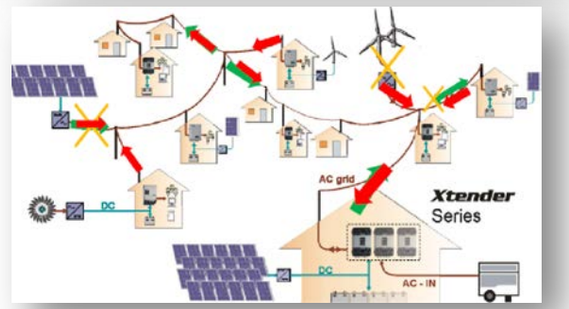
- Continued work on community solar
- Streamlined Ketchum and County solar permitting process
- Proposed building permit-based solar incentive to Ketchum City Council
- Supported completion of Ketchum's first city-owned solar installation
- Launching RePower Blaine grassroots solar and energy efficiency campaign in mid-December (possible INL grant)
- Partnered with local financial institution to offer loans

3. Grid

- Helped reduce local cost for proposed redundant transmission line from $14m to $2m

4. Micro-grid and Storage

- Made contact with Siemens, HOMER, other representatives – to discuss using their micro-grid analytics, technology and financial strategy



Project Status Now and What's Next

1. **Critical Next Steps**
   - Finalizing RePower Blaine design elements
   - Generating community interest in solar and energy efficiency
   - Determining renewable energy generation potential beyond solar
   - Securing Ketchum City Council support for energy resilience efforts
   - Working with HOMER, others to model micro-grid cost & evaluate technology and financing options

2. **Obstacles**
   - Internal and City resource constraints
   - Developing a viable community solar model in Idaho
   - Lack of utility scale solar viability (anything over 100kw) due to 2 year PPA limitation by PUC

3. **Questions**
   - Guidance: critical loads plan (e.g., technology like solar + storage)?
   - Guidance: islandable microgrid plan (working up from critical loads to ultimately reach 100% winter-peaking load)?
   - Innovative ideas for solar (PV and thermal) for low-income homes?

Minnesota e21 Initiative, Phase II

Rolf Nordstrom, President & CEO, Great Plains Institute

Results of Phase I

e21's Proposed Customer-Centric Regulatory Framework

New Utility Revenue Model

FROM: "Build More, Sell More," cost-driven & little customer choice.

TO: Revenue tied to performance, value & customer options.

Revenue aligned with:

-- Policy

-- System needs, and

-- Utility performance (e.g., EE and DER).

New Planning: Evolve IRP to Integrated System Plan

I.D. ways to reduce costs by improving efficiency of entire system.

Prepare system for growth in DER.

Realize max. value from DER (e.g., "locational value mapping").

New Regulatory Model

--More resources & flexible authority.

--More collaborative processes in advance of formal proceedings.

--More proactive exploration of issues.

--Potentially fewer rate cases, but with same protections.

New Customer Options, Predictable Rates, Better Price Signals

Ability to choose generation type & manage energy use.

Rates reflect value of DER and the Grid.

Fair & just allocation of costs; competitive rates.

e21's Status on Final Day of Accelerator 2015

1. Came to eLab Accelerator with Phase II Work Plan that was completely overwhelming and **left with still ambitious but more focused plan for Phase II.**

2. **Key lessons from our time at the eLab Accelerator were**:

    a) **More fully engage regulatory staff.**

    b) **Describe in more detail the customer value proposition** of shifting to a Performance-based Utility Compensation model.

    c) **Engage a broader range of consumer interests**.

    d) **Tackle rate reform last**, once we have broad agreement on the areas of performance we want utilities held accountable for.

e21 Progress and Activities Since Accelerator

1) **Developed consensus among e21's 25-30 participants on a Phase II Work Plan**

2) **Established three subgroups** (chaired by participants), each charged with developing Working Papers on their respective topic:

   a) **Performance-based Regulation/Utility Compensation** to define areas of performance and potential metrics for each.

   b) **Grid Modernization / Distribution Planning**
      i. How do we do distribution planning today?
      ii. What are our shared OBJECTIVES for the distribution system (what outcomes should it deliver?)
      iii. What FUNCTIONS does the distribution grid need to have to meet those objectives? (putting aside for now who should play what role)
      iv. What TECHNOLOGIES can provide those functions?

   c) **Integrated System Planning**—what sort of planning will be needed to prepare for a more complex, more distributed system?

3) **Full e21 group continues to meet monthly** to further build the group's shared understanding of the opportunities & challenges of a new regulatory/utility model.

Project Status Now and What's Next

1. e21's three subgroups should **complete Working Papers by the end of 2015** or early in 2016.

2. Just now charting our Work Plan for 2016, but likely priorities are to:
    a) Establish a **Rate Reform subgroup** to develop rate proposals that best support e21 principles & goals.
    b) Establish an **Education & Outreach subgroup** to develop a more systematic strategy for engaging interests NOT at the table.
    c) Develop a proposed **implementation strategy and timeline** for the Commission. **Key Q**: Is there a right sequence for action?

3. **Key Challenges**: Regulatory agencies are WAY under-resourced (some staff not convinced transformative change needed); not enough consumer interests at the table.

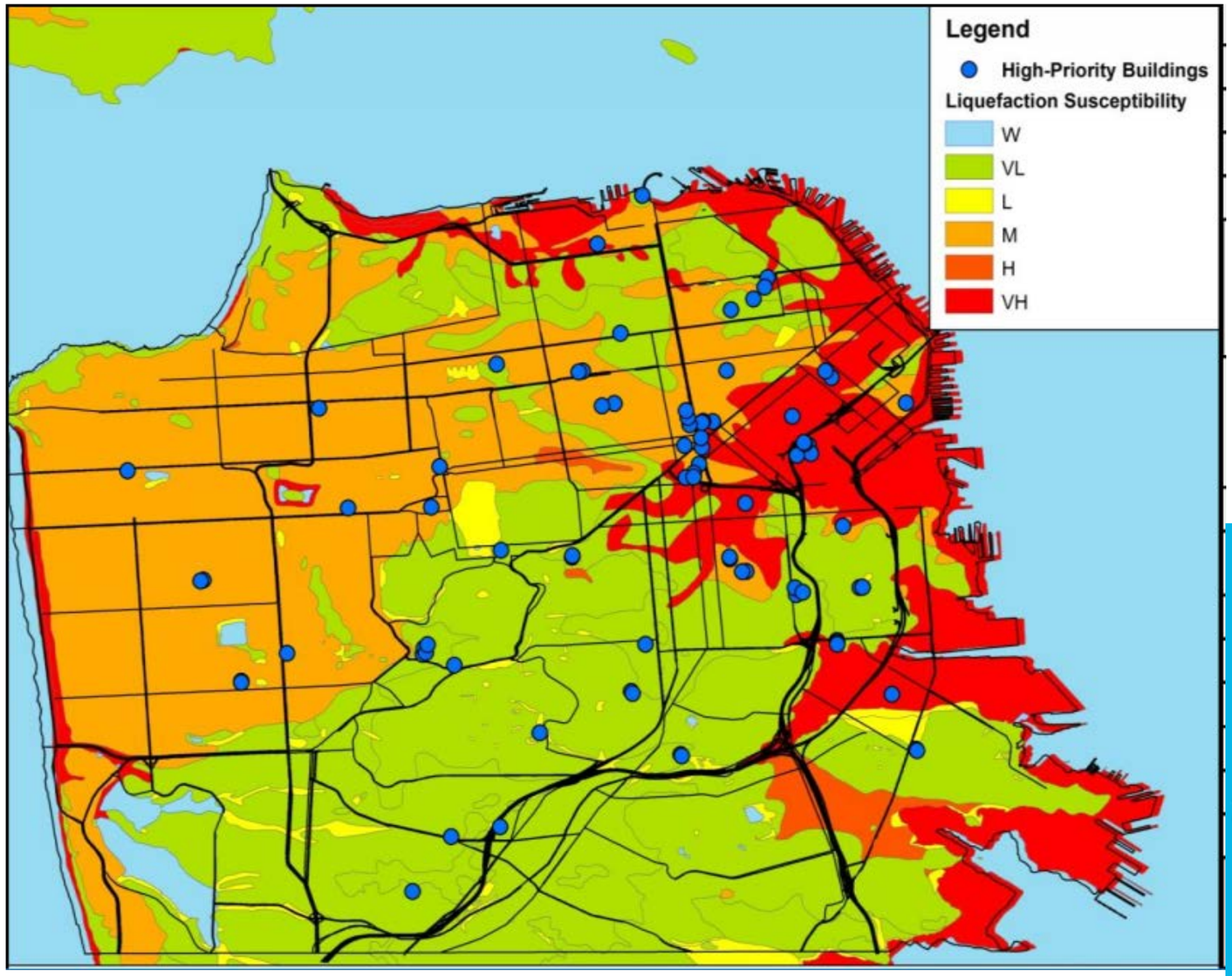
4. **Key Opportunities**: Grid Mod proceeding; Supportive Commission; continued strong engagement from utilities/others.

San Francisco Solar + Storage for Resiliency

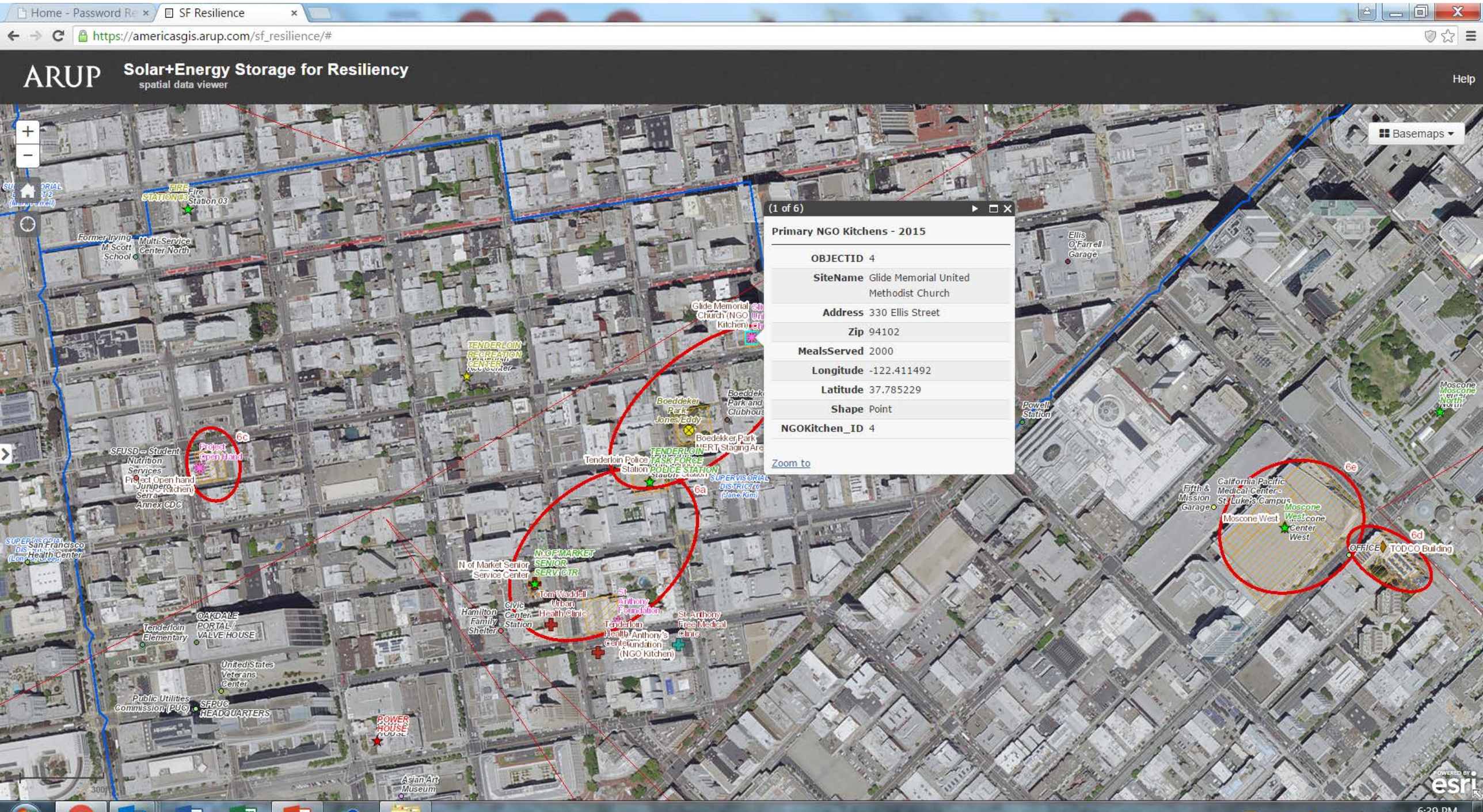
Cal Broomhead, Climate and Energy Programs Manager, City and County of San Francisco

SunShot
U.S. Department of Energy

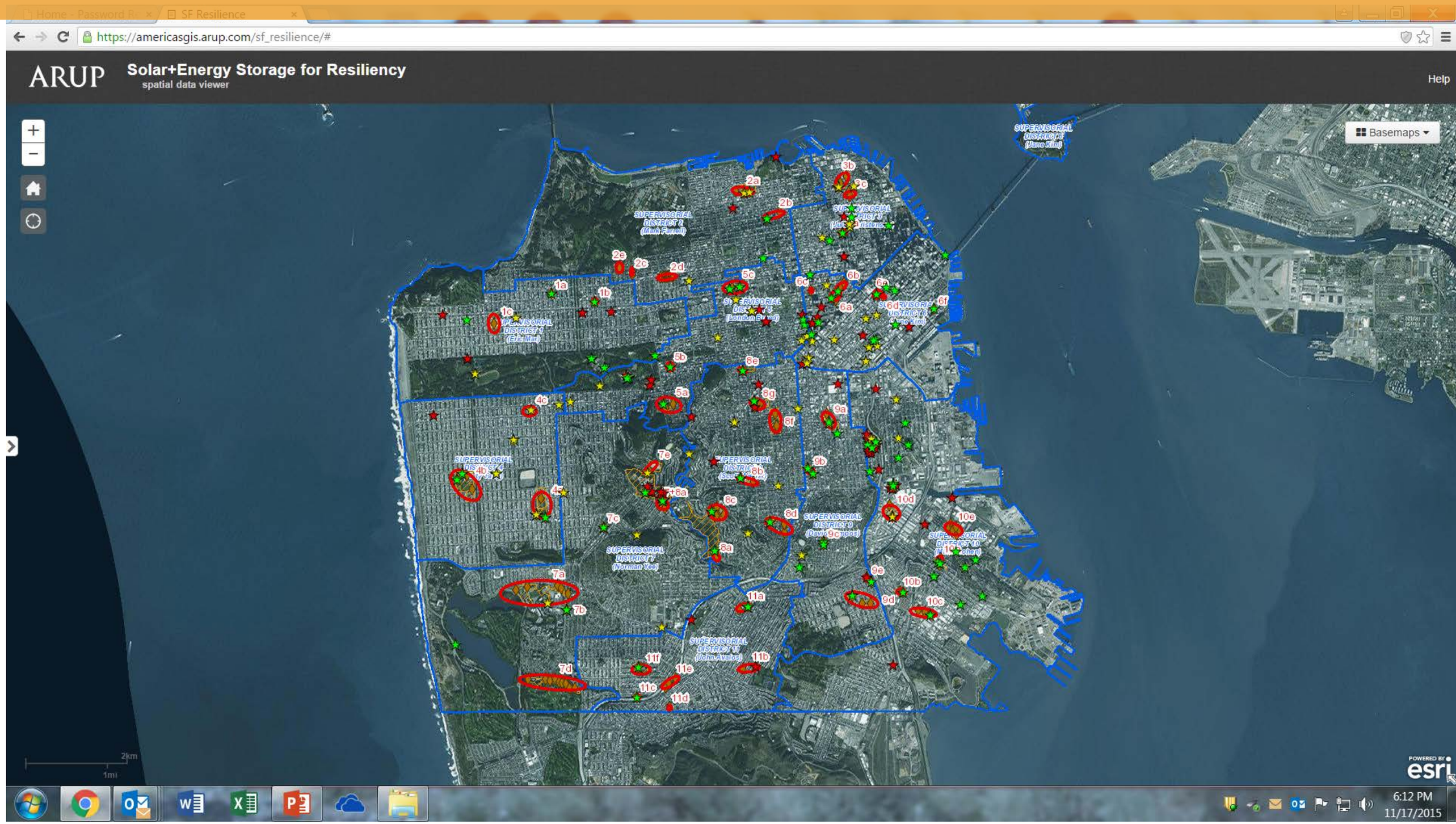
Factors Mapping



Building Data



GIS Map


SF Resilience
https://americasgis.arup.com/sf_resilience/#
ARUP
Solar+Energy Storage for Resiliency
spatial data viewer
Help
Basemaps
SUPERVISORIAL DISTRICT 2 (Mark Farrell)
SUPERVISORIAL DISTRICT 1 (Eric Mar)
SUPERVISORIAL DISTRICT 6 (London Breed)
SUPERVISORIAL DISTRICT 5 (Jane Kim)
SUPERVISORIAL DISTRICT 4 (Katy Tang)
SUPERVISORIAL DISTRICT 7 (Norman Yee)
SUPERVISORIAL DISTRICT 9 (David Campos)
SUPERVISORIAL DISTRICT 10 (Malia Cohen)
SUPERVISORIAL DISTRICT 11 (John Avalos)
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Building Selection

Board of Supervisors

Community Outreach

Questions?

Find more information at:
www.rmi.org/eLab_Accelerator