



RePowering Humboldt with

Community-Scale Renewable Energy

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CEC Workshop, Sacramento, CA

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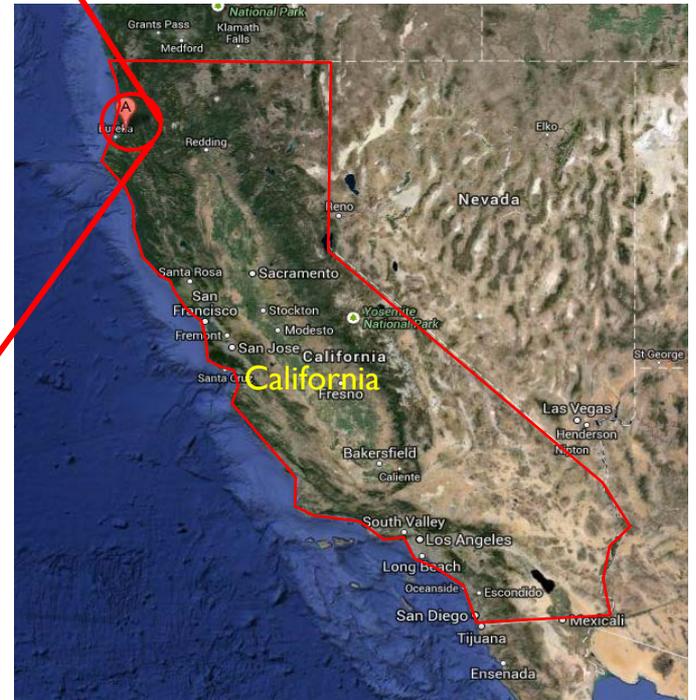




Humboldt County



Project Location







What is happening in Humboldt County?

RePower Humboldt
A Strategic Plan for Renewable Energy Security and Prosperity

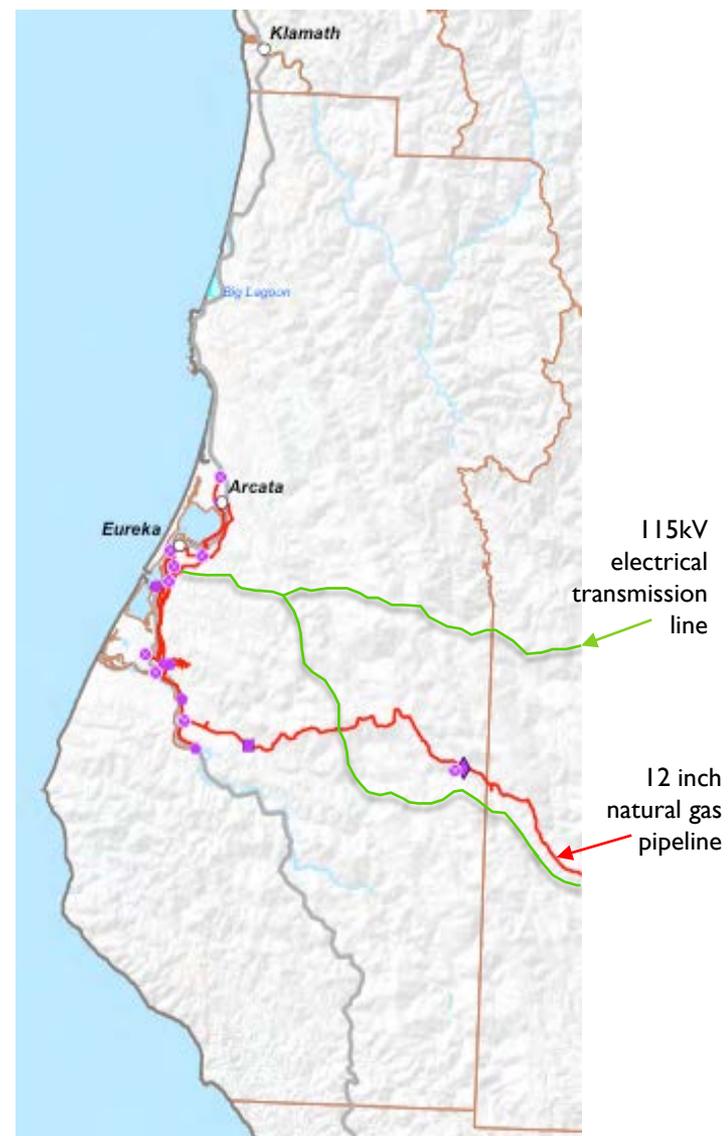


March 2013



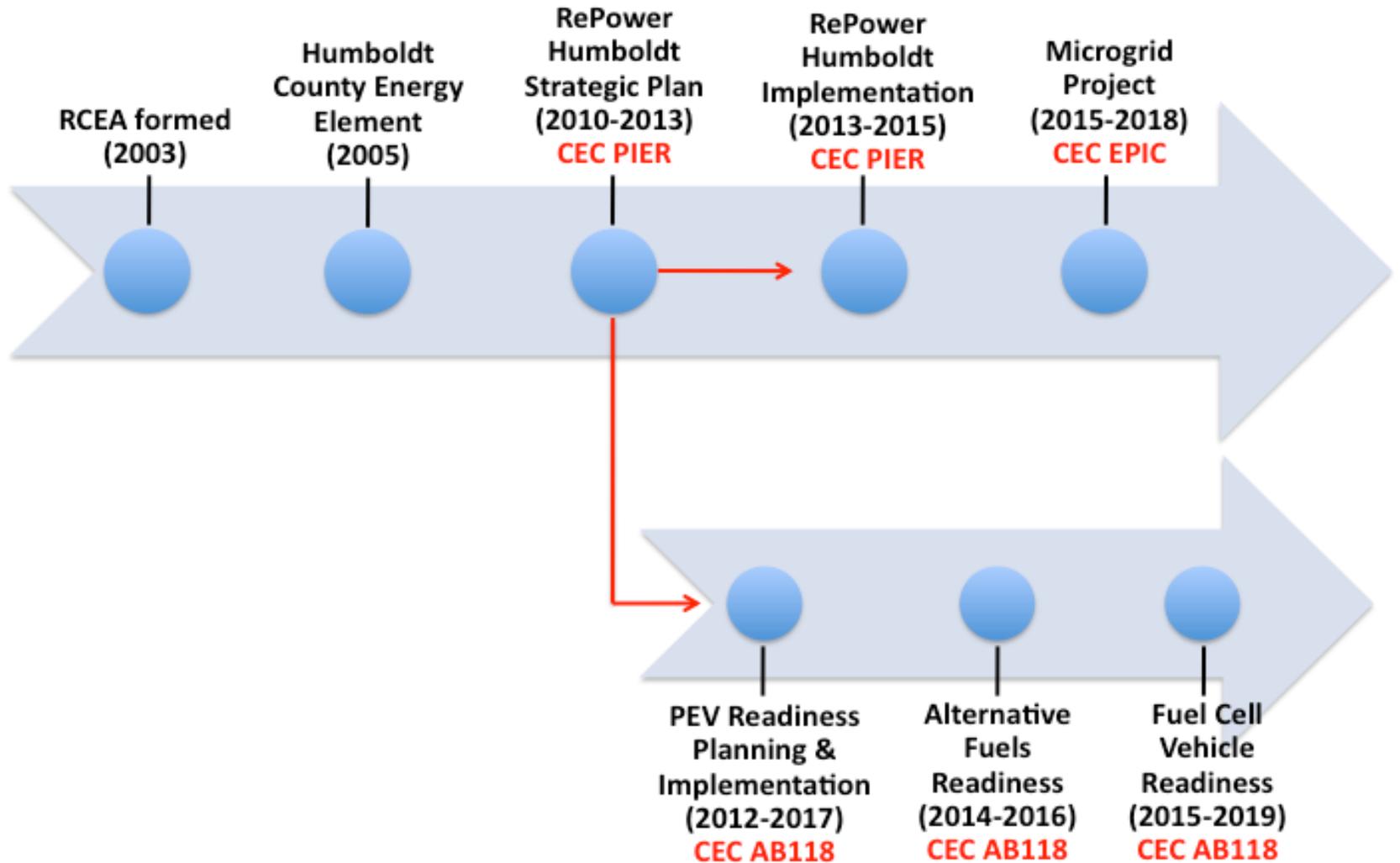
Background:

- Humboldt County is isolated
- Two 115 kV electrical transmission lines (70 MW maximum usable capacity)
- One 12 inch diameter natural gas line
- Most gasoline and diesel fuel is barged in, the rest is trucked in
- Desire for greater energy security, environmental sustainability, resiliency and economic benefit





Timeline:





REDWOOD COAST Energy Authority

Joint Powers Agency, includes all 7 local municipalities, the County, and the Humboldt Bay Municipal Water District

Purpose is to develop and implement sustainable energy initiatives that reduce energy demand, increase energy efficiency, and advance the use of clean, efficient and renewable resources available in the region





Key Partners:

- CEC PIER, EPIC, and AB118 Programs
- Pacific Gas and Electric Company
- Project Partners:
Schatz Energy Research Center
Blue Lake Rancheria/Serraga Energy





RePower Humboldt Strategic Planning Project

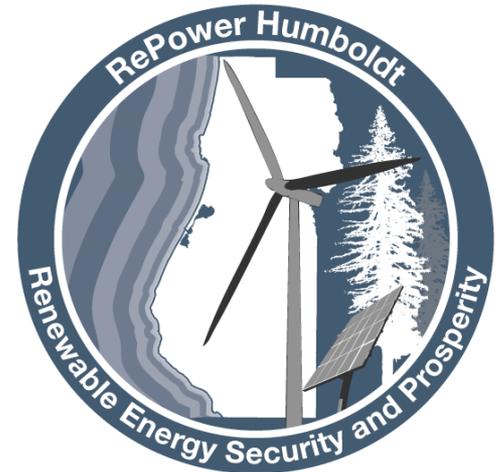
- Funded by CEC PIER Program
- Key partners included SERC and PG&E
- Goals: Develop plan for RE development in Humboldt County that would meet majority of electricity needs and large portion of heating and transportation needs
- Key activities: energy use and resource assessments, development of an hourly electricity dispatch model, assessment of optimal power mix, assessment of economic impacts, stakeholder engagement, development of a strategic plan





RePower Humboldt Strategic Planning Project (cont.)

- Key findings:
 - A renewable energy future is possible
 - It can bring economic, security and environmental benefits
 - Efficiency should be maximized
 - Biomass, wind and small hydro should play key roles
 - Switching to PEVs and heat pumps is critical to effectively reduce greenhouse gas emissions
 - Environmental quality, financial viability and local participation and control are important to local stakeholders
 - Distributed generation is an important tool for developing community-scale projects





RePowering Humboldt Implementation Project

- Funded by CEC PIER Program
- Key partners included SERC and the Blue Lake Rancheria
- Goals:
 - Implement RePower technologies and strategies on a pilot scale before rolling them out to the larger community
 - Demonstrate technical feasibility of woody biomass gasification to hydrogen fuel cell distributed generation power system





RePowering Humboldt Implementation Project

Key Activities and Results

- Developed comprehensive Energy Upgrade program for Mad River Valley
- Conducted 67 energy efficiency and 38 solar assessments
- 6 residential and 10 non-residential major efficiency upgrade projects completed/in-progress
- Installed 2 solar PV systems through GRID Alternatives and 3 non-residential solar project completed/in-progress
- Installed and assessed the performance of 2 mini-split heat pumps
- Installed EV charging stations at 2 locations

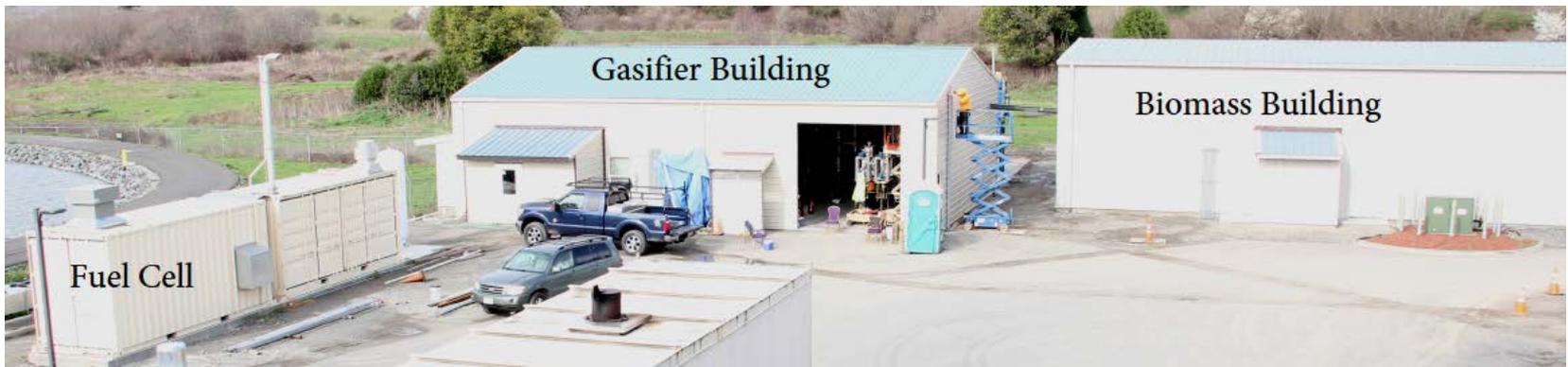




RePowering Humboldt Implementation Project

Key Activities and Results (cont.)

- Designed and installed woody biomass gasification to hydrogen fuel cell power system
- System commissioning and testing still underway





Microgrid Project

- Funded by CEC EPIC Program
- Key partners include:
 - Schatz Energy Research Center
 - Blue Lake Rancheria
 - Pacific Gas and Electric
 - Idaho National Laboratory
 - Siemens, Tesla and REC Solar
- Project Goals:
 - Install 400 kW_{AC} PV Array & 800 kWh of battery storage along with a microgrid controller, integrate with biomass gasification to fuel cell system
 - Operate the system for economic benefit
 - Operate in island mode during a local grid outage to provide power for critical services to an emergency evacuation site
 - Installation to occur summer 2016



Lessons Learned

- Community engagement, partnerships and collaborations are key.
- Conduct planning studies and put together a project team with implementation in mind.
- Tie energy projects to climate action planning, economic development, community resiliency and disaster preparedness.
- Regional efforts can allow leveraging of resources.
- Where possible leverage funding across local, state and national sources, both public and private sector.





DG Biomass Challenges/Lessons Learned

- Cutting edge technology projects are not for the faint of heart
- Commercially mature DG biomass systems are not readily available
- Suitable biomass feedstock can be a challenge
- Gasification technology is still in early commercialization stages
- Energy conversion efficiencies and system costs can pose challenges
- Codes and standards are not well developed for syngas systems



Key Accomplishments & Next Steps

- Blue Lake Rancheria was designated as a Climate Action Champion by the Whitehouse, one of 16 communities nationwide
- Continuing Implementation of RePower Humboldt Strategic Plan:
 - Alternative fuels planning and implementation
 - PACE financing programs, turn-key solar program expansion
 - Community Choice Aggregation
 - Biomass feedstock innovation
 - Off-shore renewables RD&D



Thank You



REDWOOD COAST Energy Authority

