RePowering Humboldt with Community-Scale Renewable Energy

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CEC Workshop, Redding, CA

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Schatz Energy Research Center

- Established in 1989
- Located at Humboldt State University
- Mission: Promote the use of clean and renewable energy

Credit: Kellie Jo Brown/Humboldt State University

Schatz Energy Research Center
SERC

HUMBOLDT
STATE UNIVERSITY

Champions and Partners

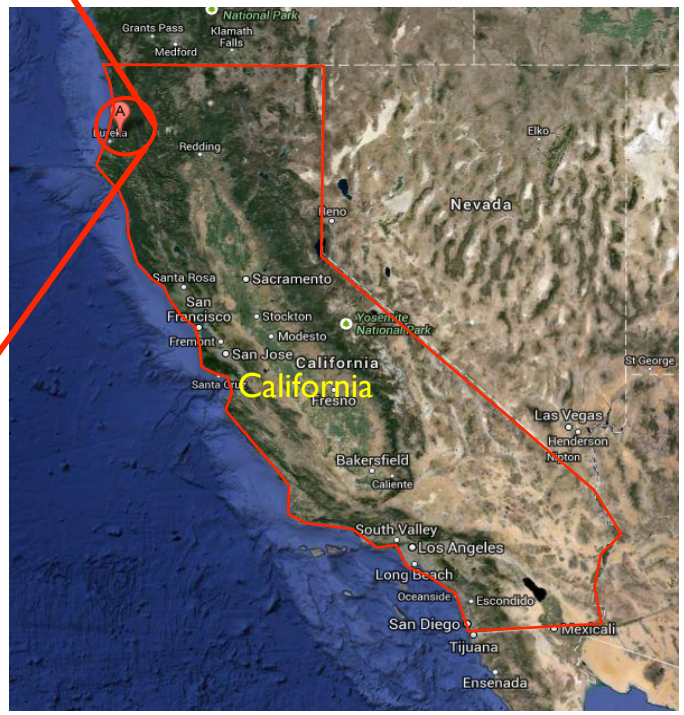
- Energy planning at the local level is relatively new
- Finding energy champions to lead the way is critical
- Key partnerships and collaborations are essential (public, private, Tribes, universities, etc.)
  - Schatz Energy Research Center at Humboldt State University
  - Redwood Coast Energy Authority
  - Blue Lake Rancheria Tribe
  - Pacific Gas and Electric Company
  - Local municipalities, local air districts, economic development agencies, regional transportation agencies, CalTrans, disaster preparedness agencies, private sector partners
- Potential funding sources: CEC, USDA, USDOE, USEPA, CA Strategic Growth Council, CALFIRE, USFS, USDOE Tribal Energy Program, US BIA Division of Energy and Mineral Development

Motivations

- Greater local control and greater choice with regard to energy services
- Energy resiliency
- Price stability
- Job creation and local economic stimulus
- Environment and climate protection
- Meeting statewide and local policy goals and regulatory requirements

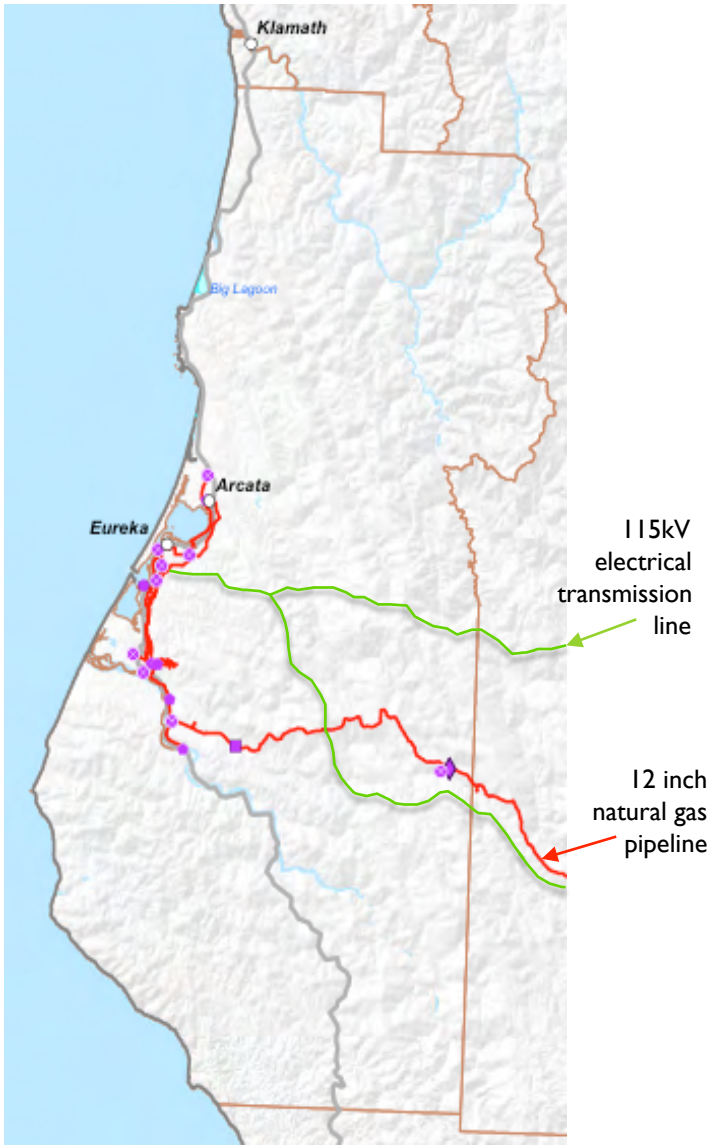
Credit: Kellie Jo Brown/HSU

Project Location

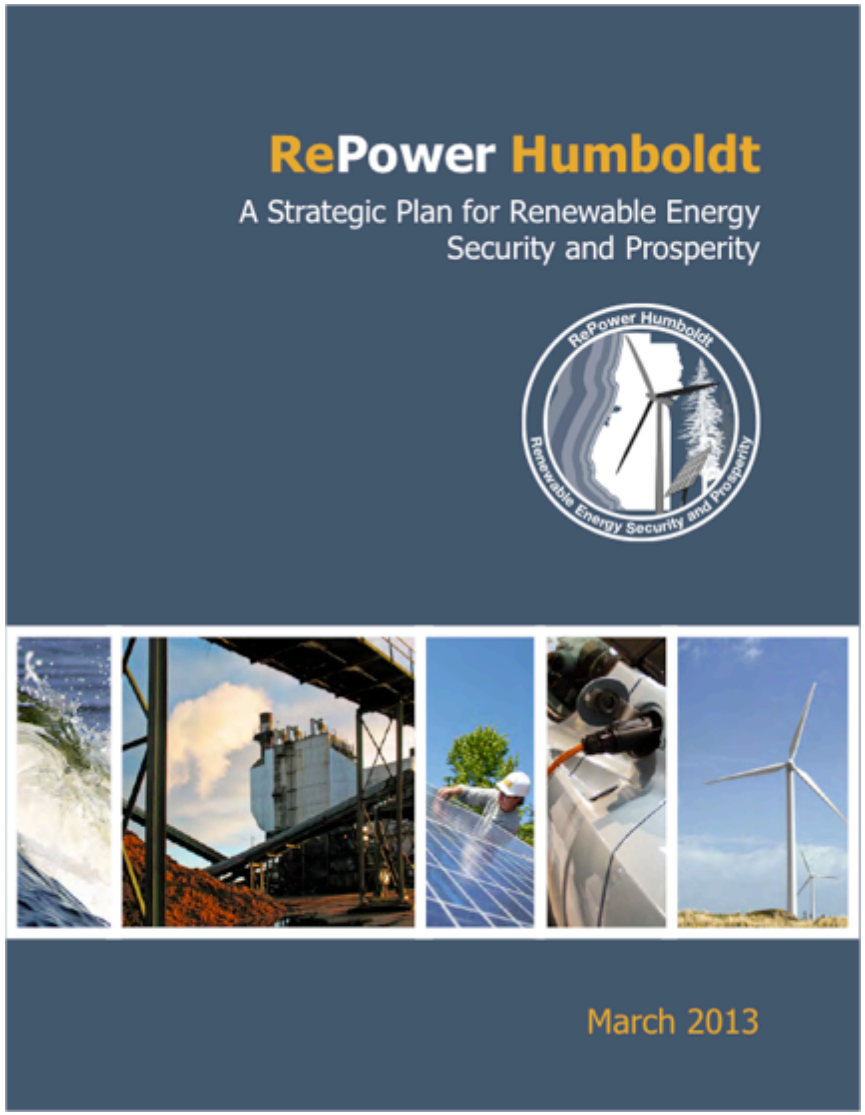


Background:

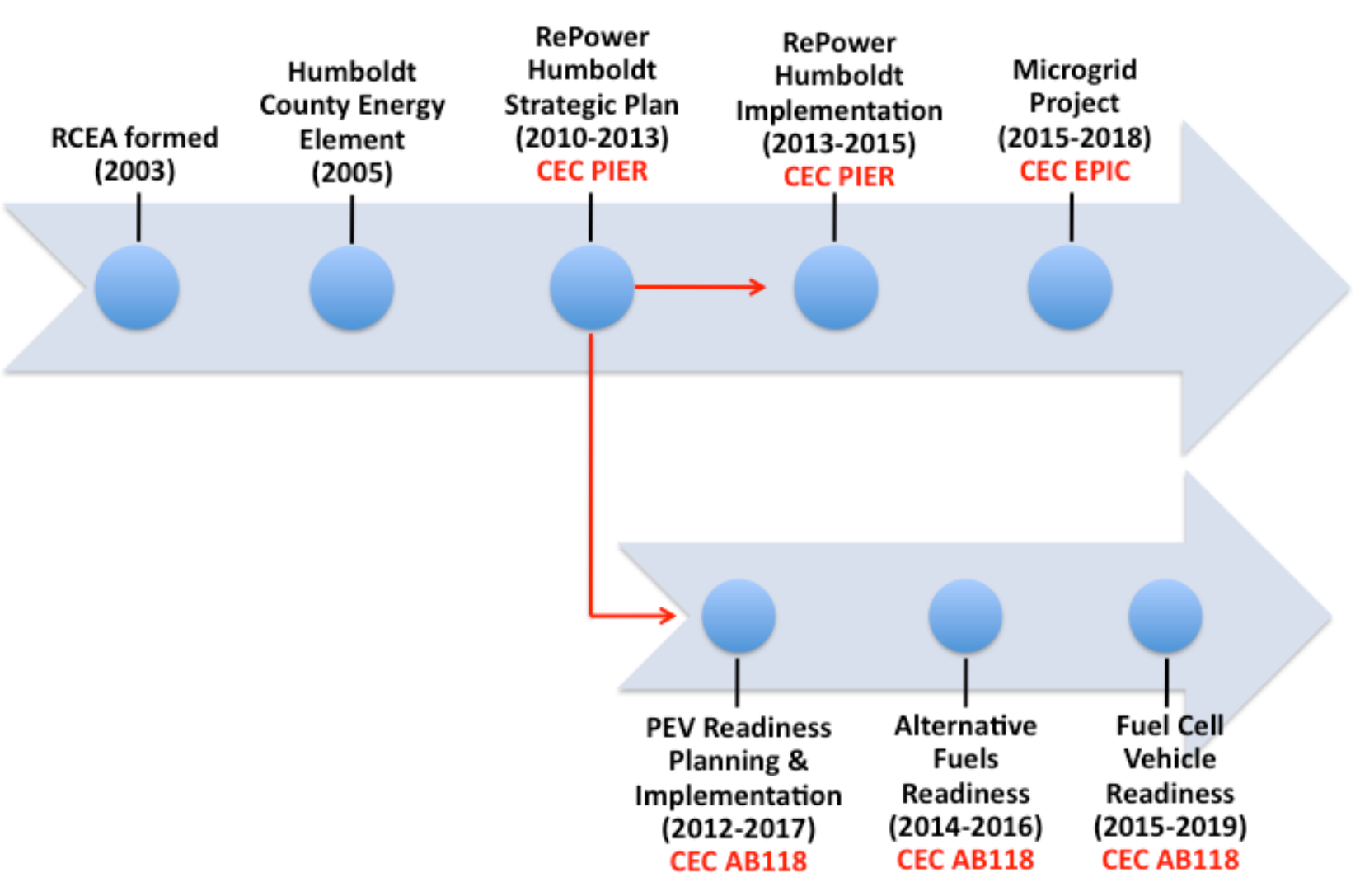
- Humboldt County is isolated
- Two 115 kV electrical transmission lines (70 MW maximum usable capacity)
- One 12 inch diameter natural gas line
- Most gasoline and diesel fuel is barged in, the rest is trucked in
- Desire for greater energy security, environmental sustainability, resiliency and economic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



What is happening in Humboldt County?



Timeline:


RCEA formed (2003)
Humboldt County Energy Element (2005)
RePower Humboldt Strategic Plan (2010-2013) CEC PIER
RePower Humboldt Implementation (2013-2015) CEC PIER
Microgrid Project (2015-2018) CEC EPIC
PEV Readiness Planning & Implementation (2012-2017) CEC AB118
Alternative Fuels Readiness (2014-2016) CEC AB118
Fuel Cell Vehicle Readiness (2015-2019) CEC AB118

REDWOOD COAST EnergyAuthority

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

RePower Humboldt Strategic Planning Project

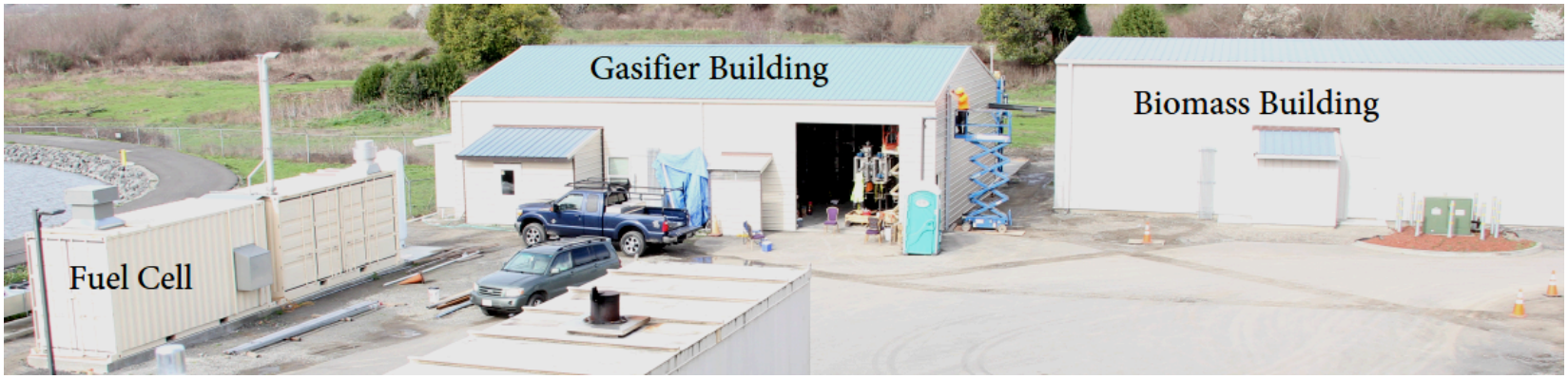
- Funded by CEC PIER Program
- Key partners included RCEA, SERC and PG&E
- Goals: Develop plan for RE development in Humboldt County that would meet majority of electricity needs and large portion of heating and transportation needs
- Key activities: energy use and resource assessments, development of 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

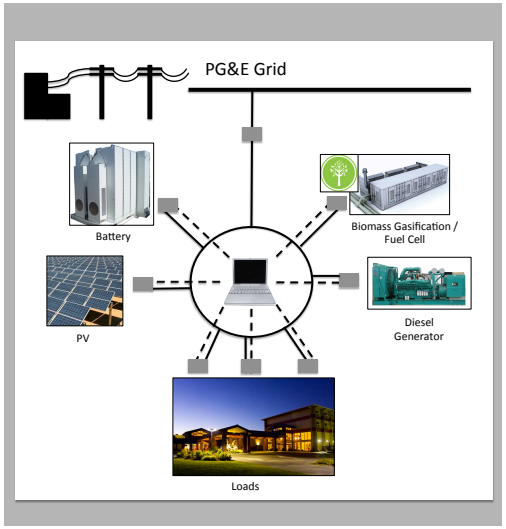
- Funded by CEC PIER Program
- Key partners included: RCEA, SERC and the Blue Lake Rancheria
- Comprehensive Energy Upgrade program for Mad River Valley (energy efficiency, solar electric, heat pumps, electric vehicle charging)
- Designed and installed woody biomass gasification to hydrogen fuel cell power system



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
- Project Goals:
  - Install 400 kW AC PV Array & 1 MWh 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

Credit: Dennis Schroeder/ NREL



Lessons Learned

- Community engagement, partnerships and collaborations are key.
- Conduct planning/feasibility 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.

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Thank You

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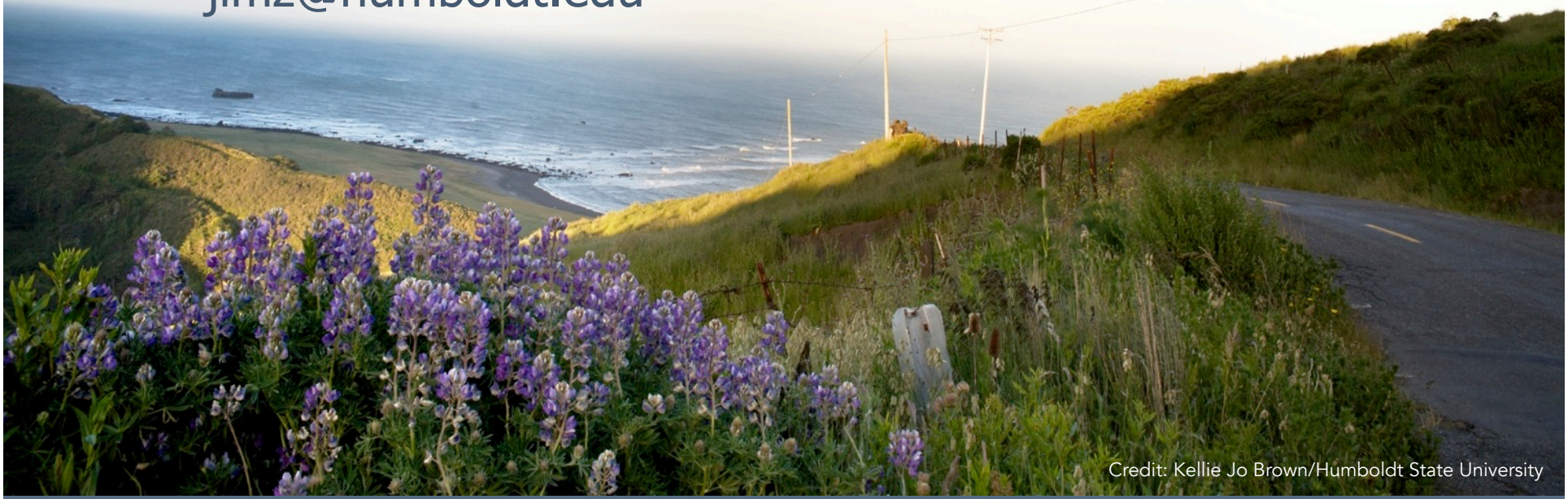

Credit: Kellie Jo Brown/Humboldt State University