Energizing California's Communities with Renewables: Recent Successes and Future Opportunities

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California Energy Commission
Rosenfeld Hearing Room
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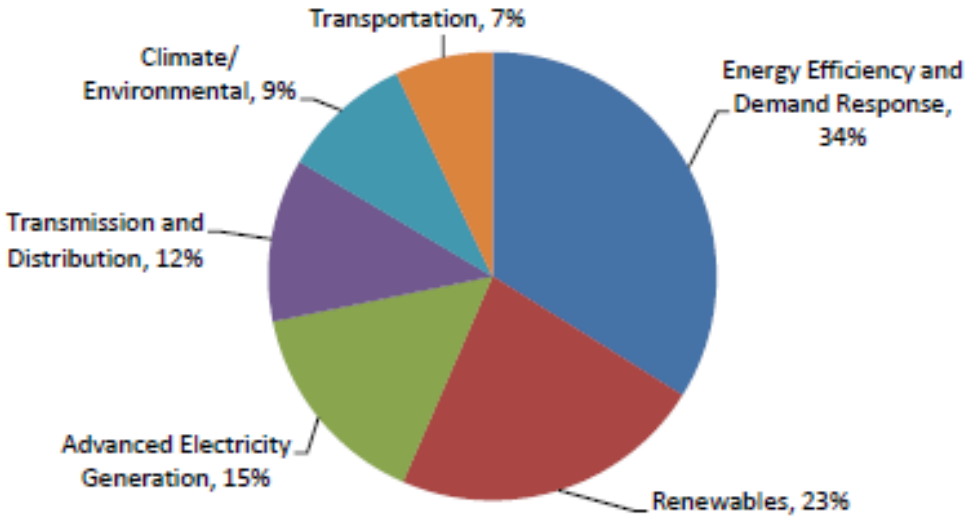
Goals of Today's Workshop

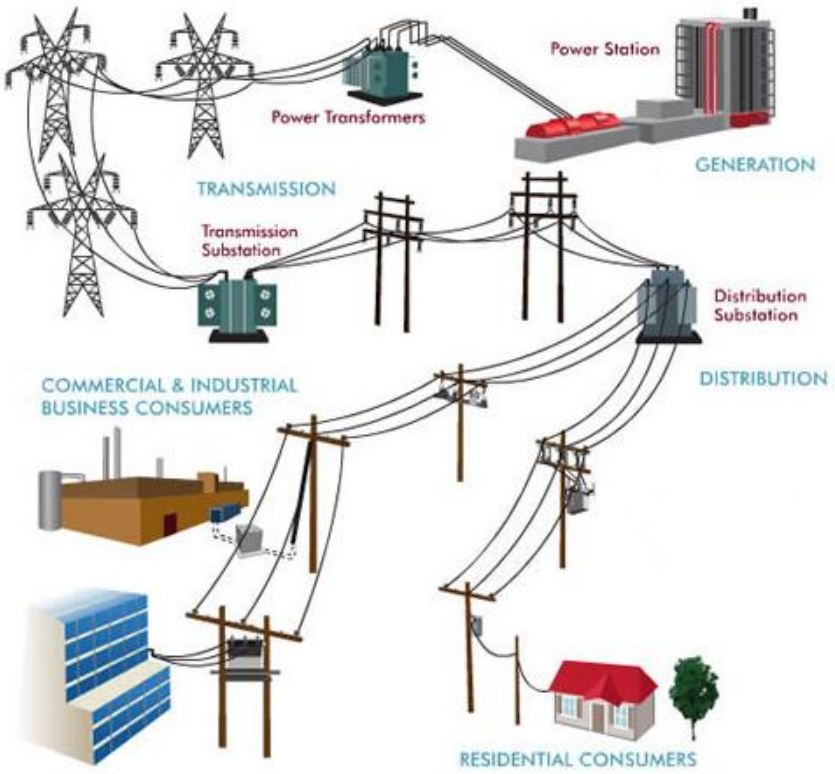
- Briefly recap the history of community scale renewable energy programs at the Energy Commission
- Capture major conclusions and lessons learned from prior planning and demonstration projects
- Highlight opportunities for moving forward under the Electric Program Investment Charge (EPIC)
- Discuss strategies for how to better engage disadvantaged communities and increase diversity of applicant pool

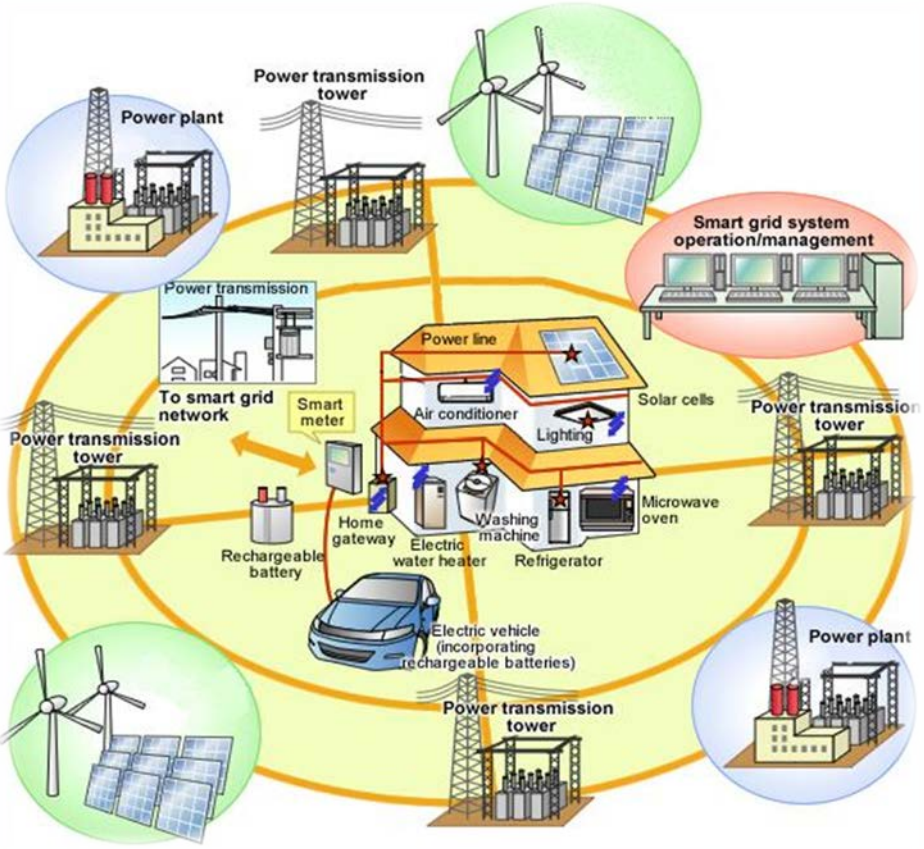
Public Interest Energy Research (PIER)

- Funded RD&D projects to develop energy technologies that provide:
  - increased environmental benefits,
  - greater system reliability, and
  - lower system costs.
- Over $911 million encumbered from 1997 - 2014



Supporting Evolution of the Electricity Grid

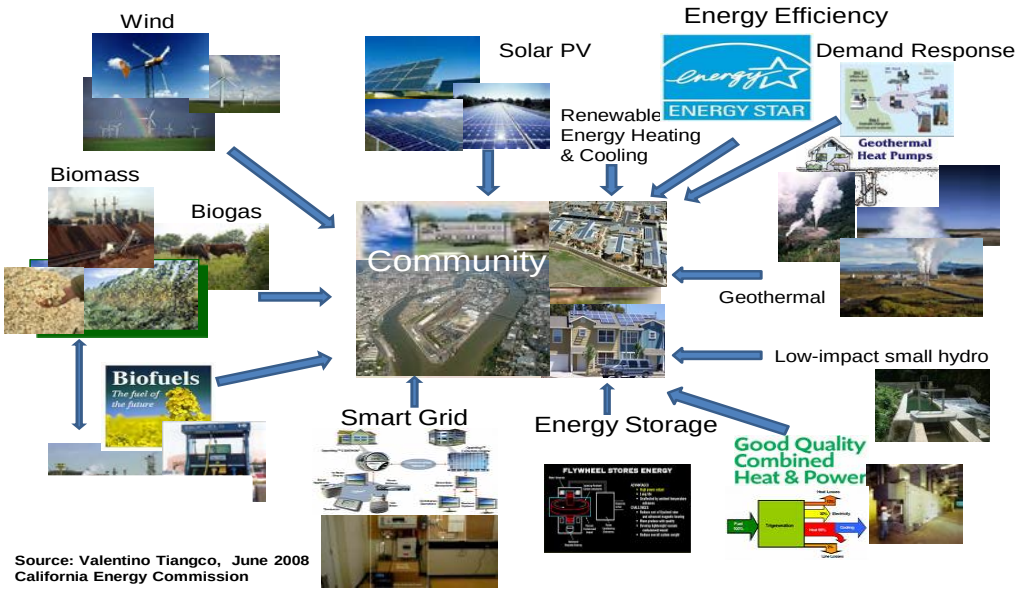




Historical Grid → "Smart" Grid

Community Scale Renewable Energy Research, Development, and Demonstration Overview

Building Blocks of Renewable-based Energy Secure Communities (RESCO)



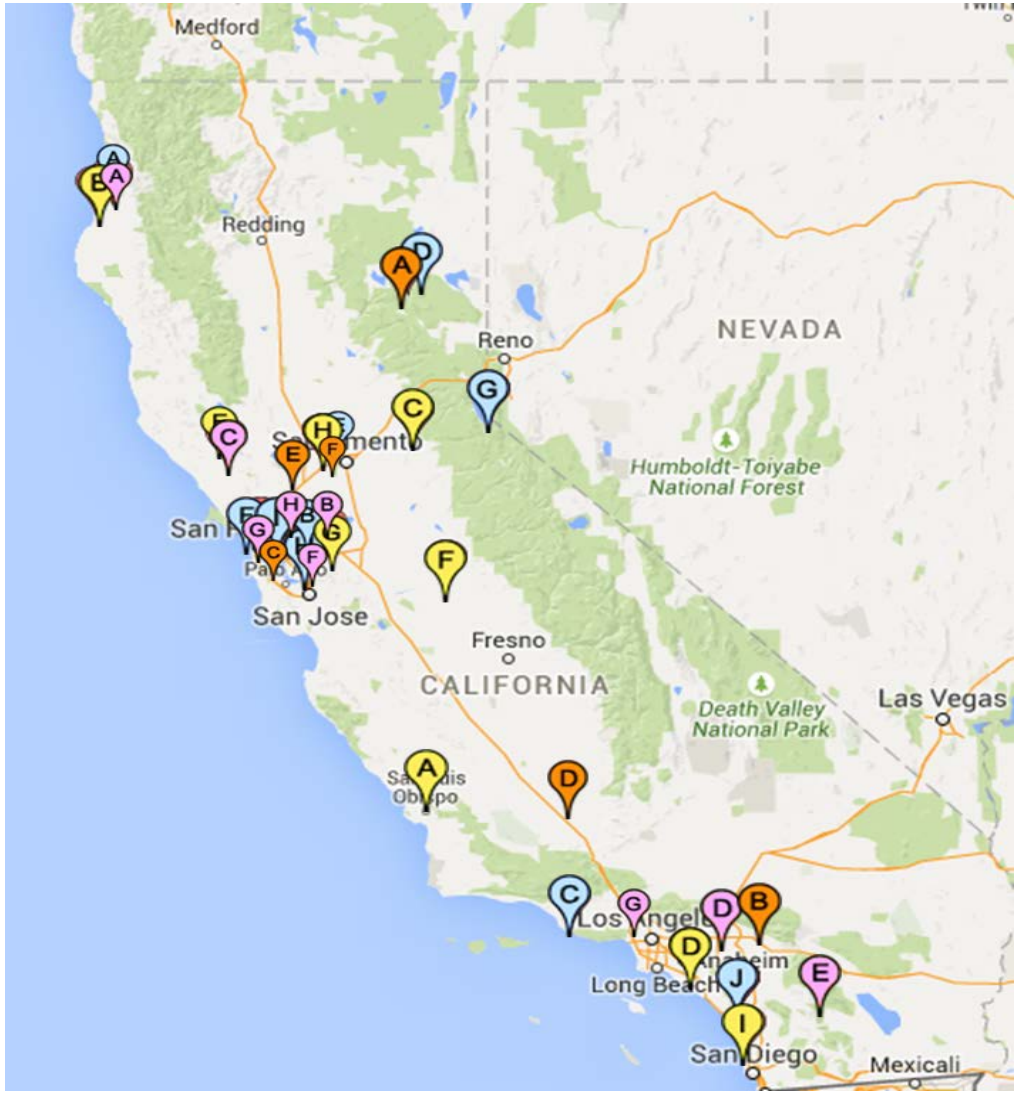
- 11 projects from 2008 solicitation
- 10 projects from 2012 solicitation
- Total awards over $18 million
- Attracted over $23 million match
- Follow-on interest and funding from numerous parties
- EPIC program aims to pick up where PIER left off

- Communities that secure their primary energy supply through locally-available renewable energy resources and community-wide energy management strategies
- PIER funding awarded under two separate solicitations
  - 2008 Renewable Energy Secure Communities (RESCO)
  - 2012 Community Scale Renewable Energy Development, Deployment, and Integration (REDDI)
- EPIC continues funding for this community scale renewable energy approach

Definition of "Community" is Diverse

- Commercial business parks
- Industrial campuses
- Urban neighborhoods
- Suburban neighborhoods
- Shopping centers
- Rural communities
- Military complexes
- Institutional/municipal facilities
  - E.g. Hospitals, prisons
- College campuses
- Mixed-use communities
- Others not included here

Geographic and Resource Diversity



PIER Solicitation PON-12-502

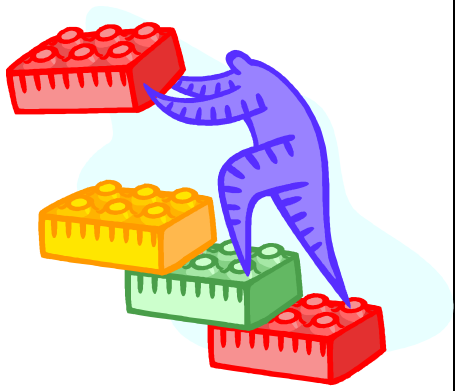
PIER Solicitation PON-08-004

EPIC Solicitation PON-14-301

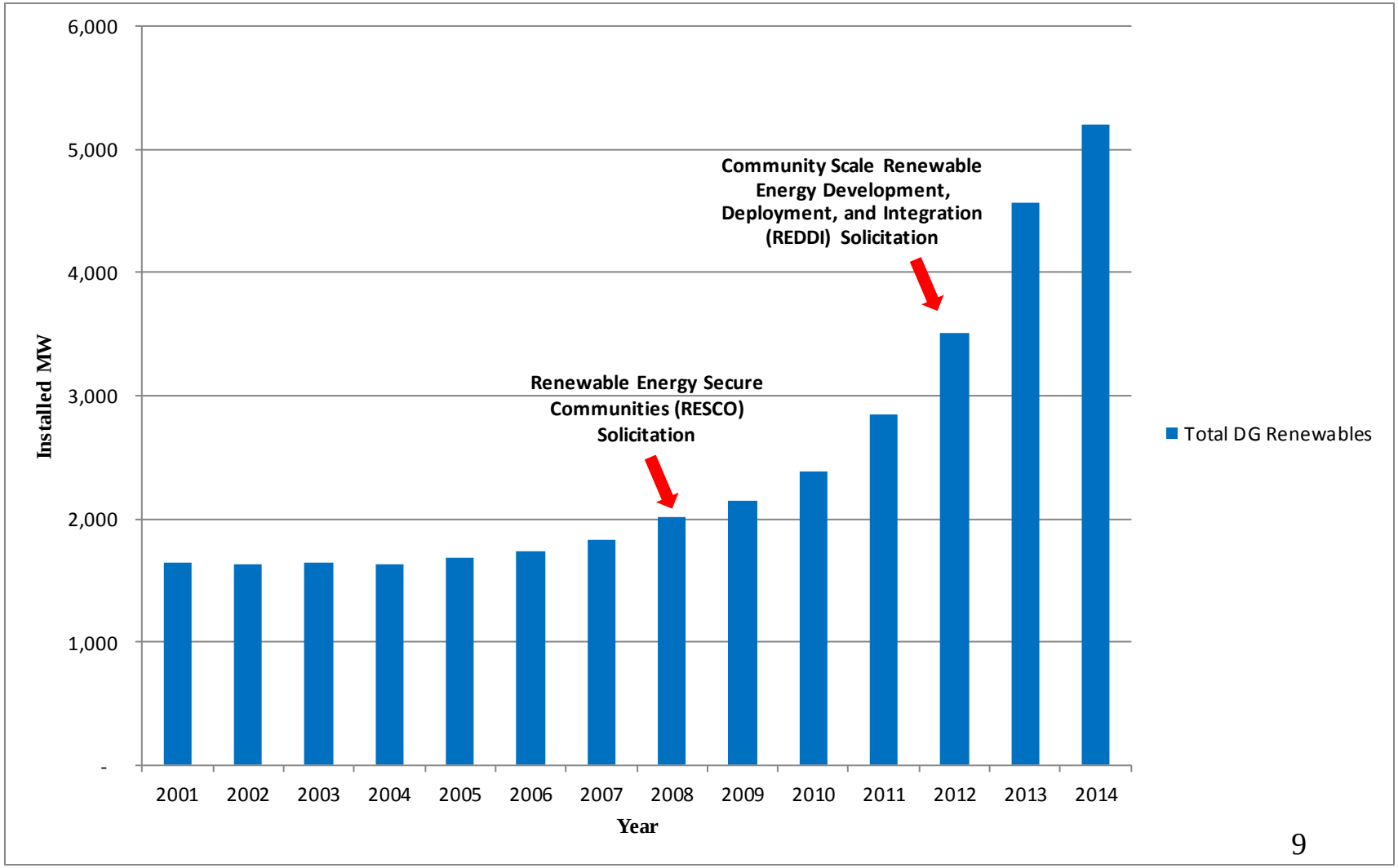
EPIC Solicitation PON-14-307

Building Blocks for Community Scale Renewable Energy

- Research and Development traditionally focused Utility Scale and distributed generation standalone technologies
- Community scale renewable energy concept was developed during a series of workshops in Summer 2008
- Renewable Energy Secure Communities (RESCO) solicitation concept released December 2008
  - Strong stakeholder interest and participation with high proposal
- RESCO Symposia held in 2010 & 2011 for mid-term updates
- Stakeholder survey conducted in July 2011 to refine program
- 2012 Community Scale Renewable Energy Development, Deployment, and Integration (REDDI) concept expanded approach
  - Strong interest once again with high participation and proposal volume



Energy Commission Programs as a Catalyst for Distributed Generation in California



Source: Energy Commission Staff Analysis (2015)

A Few Observations and Conclusions

- Each community has unique resources and decision-making structure that requires customization for energy models, etc
- It takes a large coordinated effort from a multi-stakeholder team to conduct meaningful analysis for planning efforts
  - Local Government, Academia, Industry, Utilities
- Pursuing community renewables can help achieve other local goals, such as GHG emissions and potentially drought mitigation
- Local energy plans need to account for legacy infrastructure, existing contracts and rules, and prevailing social mindsets
- Technology innovation is still needed in this area in order to maximize the benefits of local renewable energy

End Morning Presentation

- Next is a presentation from US Department of Energy (DOE) on Community Scale Renewable Energy

Session 1 – Planning for Community Scale Renewable Energy Development

10:00 – 12:00 Session 1 – Planning for Community Renewable Energy Development

- Development of Community Integrated Renewable Energy Assessment Tools
  - Cal Broomhead, San Francisco Department of Environment
- Exploring Renewable Energy Development in San Luis Obispo
  - Paul Fenn, Local Power Inc. (via WebEx)
- Assessment of Renewable Energy and Energy Efficiency in Davis
  - Mitch Sears, City of Davis
- Planning for Bioenergy and Advanced Energy Upgrades in Plumas County
  - Jonathan Kusel, Sierra Institute for Community and Environment

- Panel Discussion – Moderated by Michael Sokol, California Energy Commission

Session 1 Panel Questions

- How can the Energy Commission best leverage results of previous planning projects to help streamline future planning phase research and development?
- What types of tools or strategies have proven to be most useful for planning community renewable energy development? Are these tools available for other interested communities or unique to your project?
- How can the Energy Commission and local communities best leverage the Distribution Resource Plans (DRPs) currently in development by the IOUs to streamline project development?
  - More info on DRPs: http://www.cpuc.ca.gov/PUC/energy/drp/
- How can future projects leverage other efforts to engage communities, such as the Desert Renewable Energy Conservation Plan (DRECP), to pursue community scale renewable energy?
  - More info on DRECP: http://www.drecp.org/
- What critical needs for planning and permitting remain unaddressed? How can EPIC program help in development of these tools and strategies?
- What types of ownership and financing models have shown the most promise for helping to accelerate local renewable energy development?

Public Questions and Answers

- Session 1 Discussion
- Please state your name and affiliation clearly into the microphone
- Please keep comments within 3-5 minutes to allow enough time for others

Lunch Break

- Return at 1:30

Session 2 – Demonstrating Pathways to Renewable-Based Communities

1:30 – 3:30 Session 2 – Demonstrating Pathways to Renewable-Based Communities

- Renewable Energy in Humboldt County: From Planning to Demonstration and Beyond
  - Matthew Marshall, Redwood Coast Energy Authority
- Demonstrating Holistic Integration of Distributed Energy Resources
  - Brendan Shaffer, UC Irvine
- Piloting Strategies to Achieve Net-Zero Campus Goals
  - Gerardo Diaz, UC Merced
- Hierarchical Microgrid to Maintain Critical Loads at Camp Pendleton Marine Corps Base
  - Michael Firenze, CleanSpark

- Panel Discussion – Moderated by Prab Sethi, California Energy Commission

Session 2 Panel Questions

- What significant barriers or knowledge gaps were identified during recent demonstration projects? How have these barriers been overcome?
- Which technologies are most helpful for facilitating local renewable energy integration? Are any new technologies needed?
- How can the Energy Commission help facilitate commercialization of demonstrated products into the marketplace?
- Are there any preferred locations or community types that are ideal for community scale technology integration demonstrations?
- How can community scale renewable energy projects maximize the benefits realized by the local community and California IOU ratepayers?
- Any suggestions on how to better design community scale renewable energy demonstration opportunities in the future? What is the minimum timeframe for assembling teams/proposals, permitting, and CEQA compliance?

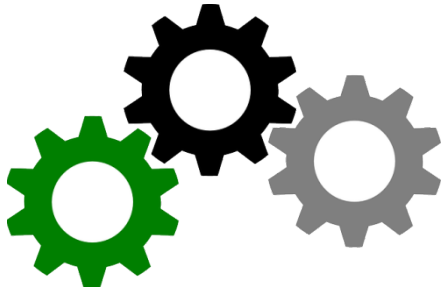
Public Questions and Answers

- Session 2 Discussion
- Please state your name and affiliation clearly into the microphone
- Please keep comments within 3-5 minutes to allow enough time for others

Some Project Takeaways

- Renewable energy resources can minimize vulnerability to disruption in service and increase local electricity grid security
- Integration of renewable energy resources and advanced technologies at the community scale is achievable
- Community scale renewable energy projects are helping California reach its climate change policy goals by reducing GHG emissions
- The Energy Commission's investment in community scale renewable energy projects generated matching funds and sparked local attention
- Regular stakeholder engagement and coordination is important for local support and development
- The Energy Commission's EPIC program continues to advance innovative technologies for community scale renewable energy
- There are a number of Energy Commission programs that communities can leverage to spark local renewable energy development

Technical Innovation is Still Needed!



- Smart Microgrid Controllers
- Smart Inverters for High Penetration Solar
- Zero-Net Energy/Carbon Communities
- Master Community Planning for Carbon Reduction
- Forecasting and Prediction of Grid Conditions
- Electric Vehicle Integration
- Community Scale Energy Storage Solutions
- Streamlined Planning and Permitting

Electric Program Investment Charge (EPIC)

- Established by CPUC in 2012 to fund investments to advance clean energy technologies and approaches for the benefit of investor-owned utility electricity ratepayers.
- The Energy Commission administers approximately $130 million per year.
- EPIC uses an **energy innovation pipeline** approach to creating new energy solutions, fostering regional innovation, and bringing clean energy ideas to the marketplace

EPIC Continues to Fund Solutions

- EPIC Microgrid Demonstrations
  - Critical Facilities
  - High-penetration renewables
  - Grid-linked Electric Vehicles

- EPIC Community Scale Renewable Energy Demos
  - Integrated community energy management strategies to reduce peak demand and costs, and maximize benefits
  - Targeted for disadvantaged communities

Anticipated 2015 EPIC Solicitations

Solicitation Title	Program Area/Strategic Objective	Estimated Funding Amount
Conduct Energy Research Gap Assessment and Roadmapping	Applied Research and Development (S10)	$3 million
Reduce the Environmental and Public Health Impacts of Electricity Generation and Make the Electricity System Less Vulnerable to Climate Impacts: Phase II	Applied Research and Development (S5)	$8.5 million
Sustainable Energy Entrepreneur Development (SEED) Initiative	Applied Research and Development (S10)	$16 million
Regional Energy Innovation Clusters	Applied Research and Development (S10)	$8 million
Clean Energy Research, Technology Showcase, and Policy Forums	Market Facilitation (S18)	$1 million
Measuring Innovation Progress to Guide Future Investment	Market Facilitation (S18)	$1 million
Establish Strategies for Enhanced Local Regulatory Assistance and Permit Streamlining that will Accelerate Deployment of Clean Energy	Market Facilitation (S16)	$17.3 million
Connecting Emerging Technologies and Strategies to Market Needs and Opportunities	Market Facilitation (S18)	$3 million
Developing Technologies, Tools, and Strategies to Enable the Smart Grid of 2020	Applied Research and Development (S6)	$8 million
Guiding Future Energy Needs, Plans, and Programs through Commercial End-Use Surveys	Market Facilitation (S18)	$8 million
Reducing Costs for Communities and Business Through Integrated Demand-Side Management and Zero-Net Energy Demonstrations	Applied Research and Development (S1)	$3 million
	Technology Demonstration and Deployment (S12 & S14)	$20 million
Developing New Technologies and Applications that Enable cost-beneficial Customer-Side -of-the-Meter Energy Choices	Applied Research and Development (S2)	$16.4 million
Developing a Portfolio of Advanced Efficiency Solutions (Phase 2)	Applied Research and Development (S1)	$7 million
Developing Operational Tools, Models, and Simulations to Improve Grid Resource Planning	Applied Research and Development (S7)	$TBD

This list is updated periodically online at: http://energy.ca.gov/contracts/epic.html

Current Opportunities Under EPIC

- The EPIC Challenge: Accelerating the Deployment of Advanced Energy Communities
  - Request for Comments was just released (due August 14)

  http://www.energy.ca.gov/research/notices/index.html#epic_challenge_aec
- Zero Net Energy (ZNE) Buildings and Communities
  - Request for Input is currently ongoing (due August 13)

  http://www.energy.ca.gov/research/notices/ZNE_buildings/2014-07-24_EPIC_Research_Input_ZNE.pdf
- 2nd EPIC Investment Plan Implementation
  - Microgrids, Smart Grid, ZNE, and much more…
  - Plans available for download at:

    http://www.energy.ca.gov/research/epic/documents/

Next Steps – Regional Workshops

1) Oakland (Sept 17 at Elihu M Harris State Building)*
   - Northern California urban communities & distributed PV
2) Fresno (Sept 23 at San Joaquin Valley Air Pollution Control District)*
   - Central Valley communities with ag/dairy waste & solar
3) San Bernardino (Sept 29 at Norman F. Feldheym Central Library)*
   - Desert communities with solar & geothermal
4) Lynwood (Sept 30 at Bateman Hall)*
   - Southern California urban communities & distributed PV
5) Redding (TBD)*
   - Rural communities, the North State, & woody biomass
6) San Diego (TBD)*
   - Coastal communities & distributed PV

*Workshop dates and locations are tentative

Implementing Diverse and Inclusive Energy Innovation in California

- The Energy Commission is committed to ensuring that a diverse range of applicants has the opportunity to participate in EPIC projects, including small businesses, women, minorities, and disabled veterans.
- Under the EPIC program, the Energy Commission also seeks to include the participation of businesses from a range of geographic regions.

Connect with Us

…and the Energy Commission's listserves

Session 3 – Discussion Questions

- What are some strategies the Energy Commission can use to help facilitate community scale renewable energy proposals from a more diverse applicant pool, including disadvantaged communities?
- How can disadvantaged communities best leverage previous successful projects to pursue local renewable energy development strategies?
- How can previous awardees best facilitate outreach and tech transfer to disadvantaged and/or underserved communities?

Closing Comments

Thank you for participating!

Send any questions to
michael.sokol@energy.ca.gov